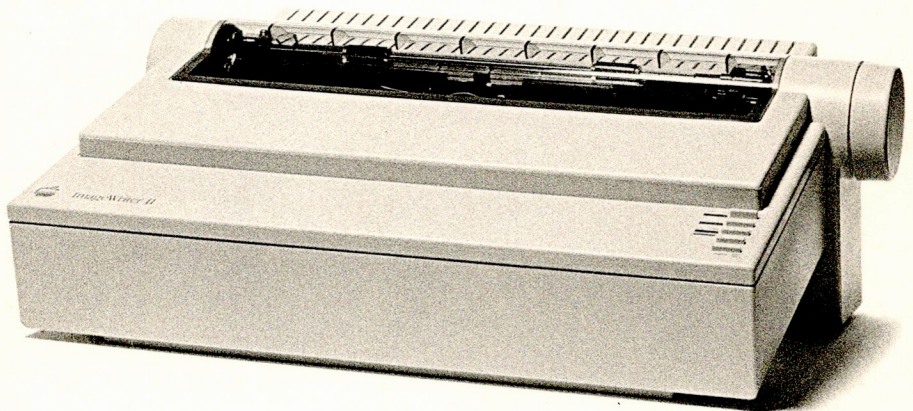




# Apple® ImageWriter® II Owner's Guide



All Apple II and Macintosh® Computers

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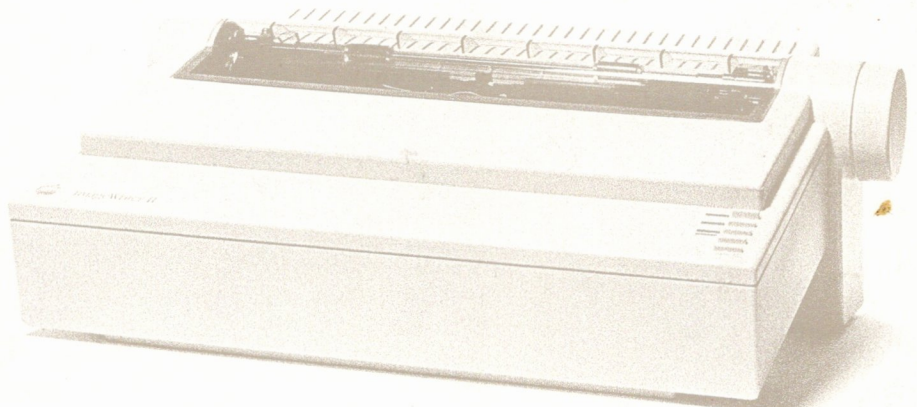
### **WARNING**

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. Only peripheral devices (computer input/output devices, terminals, printers, and so on) certified to comply with Class B limits may be attached to this computer.

Operation with noncertified peripheral devices is likely to result in interference to radio and television reception.



# Apple® ImageWriter® II Owner's Guide



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## 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 our 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 of 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. To further isolate the problem, disconnect the peripheral devices and their input/output (I/O) cables one at a time. If the interference stops, it was caused by either the peripheral device or the I/O cable. These devices require shielded I/O cables. 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.

A **shielded cable** has a metallic wrap around the wires to reduce the potential effects of radio-frequency interference.

If your computer 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 set 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 television set.

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

### △ 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 radio, television, and other electronic devices. △

## About This Manual

**T**HIS MANUAL TELLS YOU HOW TO SET UP AND USE YOUR IMAGEWRITER® II printer. Step-by-step instructions, operating tips, illustrations, and photographs make it easy to start using your printer.

This preface gives you an outline of the book that you can use to find specific topics, or just to see how the manual is laid out. After that there's a brief description of the visual cues the manual uses to alert you to special kinds of information.

---

## Manual overview

Here's a quick overview of the manual's chapters and appendices.

- Chapter 1 introduces you to the ImageWriter II's features and available options.
- Chapter 2 shows you how to set up, start, and test the ImageWriter II.
- Chapter 3 tells you how to connect the ImageWriter II to the Macintosh Plus, the Macintosh SE, and the Macintosh II.
- Chapter 4 tells you how to connect the ImageWriter II to the Apple IIGS, the Apple IIc, the Apple IIe, the Apple II Plus, and the Apple II.
- Chapter 5 discusses details of working with the ImageWriter II. You'll learn to use the printer's features to get the best results with different paper types, fonts, and options.
- Chapter 6 covers troubleshooting.
- Chapter 7 focuses on care and maintenance.
- Appendix A tells you how to connect the ImageWriter II to the Macintosh 128K, the Macintosh 512K, and the Macintosh 512K enhanced.
- Appendix B discusses advanced techniques for controlling printer output using an Apple II computer with your ImageWriter II.
- Appendix C contains ASCII code tables.
- Appendix D presents the ImageWriter II printer and interface specifications.
- A glossary of printer terms, an index, and a quick reference card conclude this manual.

For a detailed discussion of the ImageWriter II, see the *ImageWriter II Technical Reference Manual*.

Take a few minutes to fill out the Tell Apple card at the back of the manual. Let us know what you liked about the manual, and what you'd like us to do differently.

---

## Aids to understanding

Look for these visual cues throughout the manual:

❖ *By the way*: Text set off in this manner presents sidelights or interesting pieces of information.

△ **Important** Text set off in this manner—and with a tag in the margin—presents important information. △

---

▲ **Warning** Warnings like this indicate potential problems or disasters. ▲

**Special terms** appear in boldface type when they are introduced. Sometimes additional information about the term may appear in the margin; the term is always defined in the glossary.

Throughout the manual, references to Macintosh refer to all models of the Macintosh; references to Apple II refer to all models of the Apple II.



---

## Meet the ImageWriter II

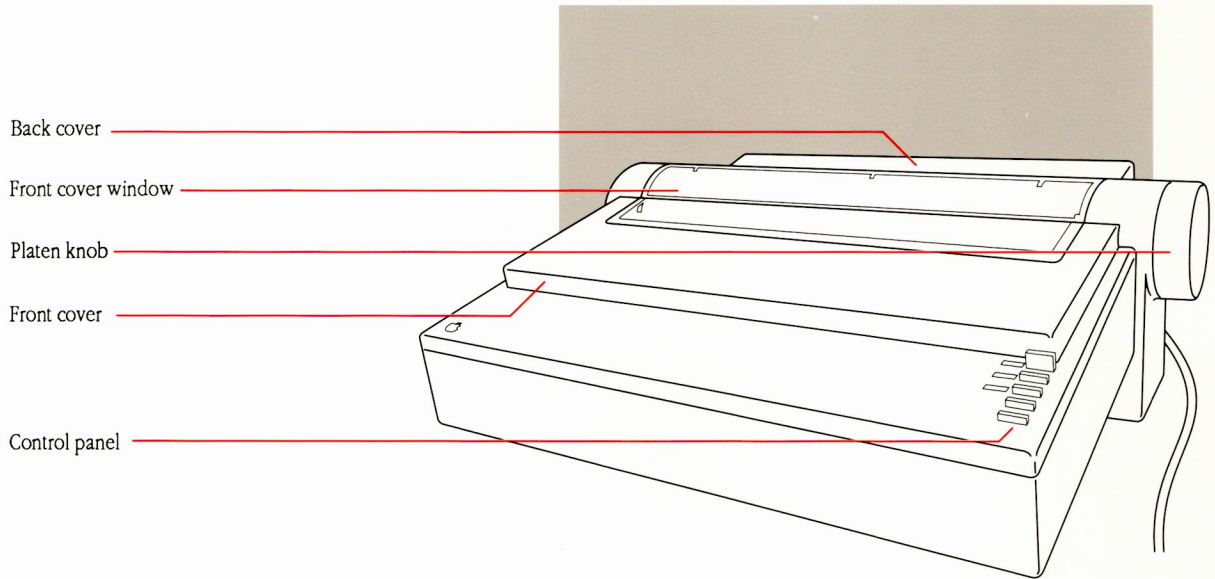
THE APPLE® IMAGEWRITER® II IS THE IDEAL ADDITION TO YOUR APPLE computer. The versatile ImageWriter II combines ease of operation with high performance features to produce professional-quality graphics and text printouts.

This chapter introduces you to the parts of the ImageWriter II and to what you can do with your ImageWriter II. You'll also read about the extended capabilities you can add with the ImageWriter II options—the ImageWriter II SheetFeeder, the ImageWriter II 32K Memory Option, and the ImageWriter II/LQ LocalTalk™ Option.

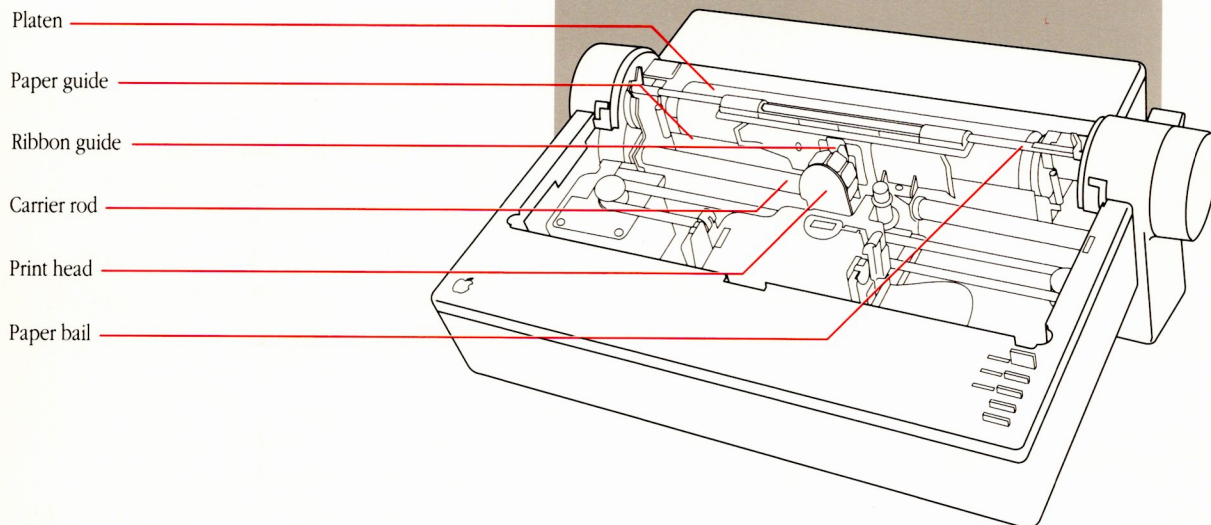
---

## ImageWriter II parts

These illustrations provide a visual introduction to the ImageWriter II.



**Figure 1-1**  
ImageWriter II major parts



**Figure 1-2**  
Inside the ImageWriter II

---

## ImageWriter II features

The ImageWriter II gives you the power and versatility to

- select the text quality you need: draft quality to get a memo out as quickly as possible, standard quality for everyday work, or near letter quality (NLQ) for important documents and presentations
- include graphics to give a presentation more visual impact
- highlight text and graphics with color to dress up and emphasize key points in your documents
- choose from a variety of paper and form types (cut-sheet and perforated pin-feed paper, mailing labels, envelopes, multipart forms)
- see on your screen (when using a Macintosh) exactly what your documents will look like before you print them

The ImageWriter II can print high-resolution graphics, ideal for use with Macintosh computers and with graphics programs written for Apple II computers.

The ImageWriter II's high-speed print mechanism can turn out text at speeds up to 250 characters per second.

---

## Easy paper loading and ribbon changes

The ImageWriter II features automatic **paper loading** for single-sheet paper, and the built-in pin-feed paper tractor makes it easy to load pin-feed paper.

Ribbon changes are a snap too. Ribbon cartridges click in and out quickly and neatly. Whether you print in black or color, you get high-quality images and long life from these continuous-loop fabric ribbons.

---

## Seven-color printing

To print color graphics, click in an ImageWriter II color ribbon. With **application software** that supports color printing, you can print documents in six colors plus black. You can even place black text next to color graphics.

---

## Programmable features

To make more sophisticated demands on the ImageWriter II, consider these programmable features.

---

### Text formatting and character sets

By using most Macintosh applications or by taking advantage of programmable features on an Apple II computer, you can use the ImageWriter II to print

- boldface type
- underlining
- subscripts and superscripts
- half-height characters
- various type sizes (from 4.5 to 17 characters per inch)
- several character sets (American plus seven European sets)
- custom characters

---

### Special formatting features

The ImageWriter II provides special formatting features:

- horizontal tab settings
- spacing—proportional or standard
- lines-per-inch and lines-per-page settings

---

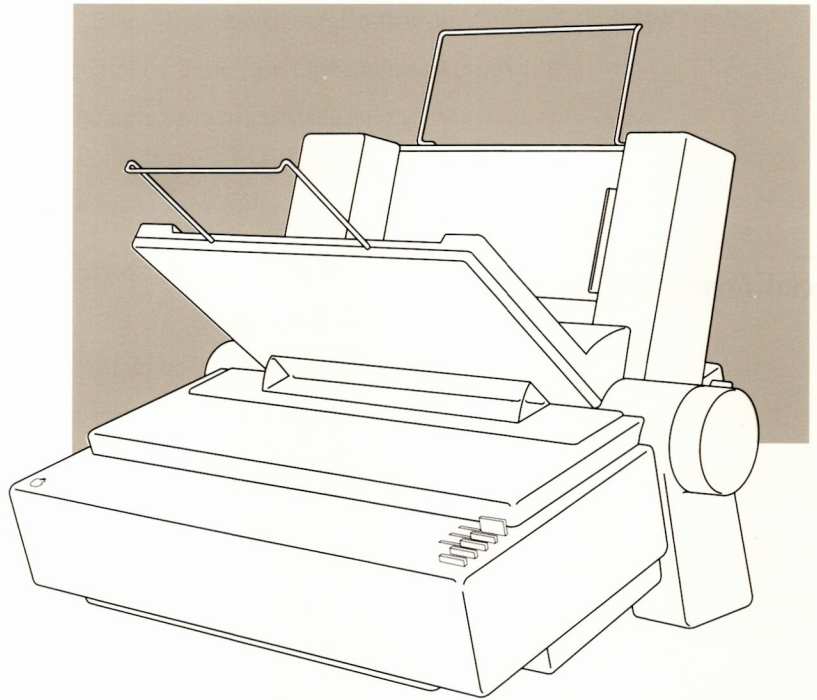
## ImageWriter II options

To extend the capabilities of your ImageWriter II, consider adding these options—the ImageWriter II SheetFeeder, the ImageWriter II 32K Memory Option, and the ImageWriter II/LQ LocalTalk Option.

---

### The ImageWriter II SheetFeeder

You'll find the ImageWriter II SheetFeeder perfect for large printing jobs on individual sheets of letterhead and other standard paper. You no longer have to feed pages in one at a time. Load the SheetFeeder with up to 100 individual pages. It feeds each sheet as the printer demands, and stacks the printouts.



**Figure 1-3**  
The ImageWriter II with SheetFeeder installed

---

## The ImageWriter II 32K Memory Option

Designed for Apple II computers, the memory option is an excellent way to expand the printer's memory and increase your own productivity. With the ImageWriter II 32K Memory Option, you can send a document of up to 32,000 characters (16 to 20 pages) to the printer, freeing up your computer for other work while the ImageWriter II does the printing.

---

## The ImageWriter II/LQ LocalTalk Option

An **AppleTalk® network system** is made up of three components: a cable system to link devices, software that supports the network (built into every Macintosh and Apple IIGS), and optional services (the AppleShare® File Server and AppleShare Print Server, for example). LocalTalk is one cable system that allows you to connect devices on an AppleTalk network system.

By adding a LocalTalk card and connecting your ImageWriter II to an AppleTalk network system, you can have up to 31 computers around your workplace or school share the ImageWriter II.

❖ *Note:* The ImageWriter II can take either the LocalTalk Option or the 32K Memory Option, but not both.



---

## Basic ImageWriter II Setup

THIS CHAPTER SHOWS YOU HOW TO

- unpack your ImageWriter II
- plug in the power cord
- install the ribbon
- load paper
- run the ImageWriter II's self-test

The steps in this chapter are the same no matter what type of Apple computer you plan to connect to the printer. After you've completed this chapter, you can turn to Chapter 3 for instructions on connecting Macintosh computers, or Chapter 4 for instructions on connecting Apple II computers.

---

## Unpacking the ImageWriter II

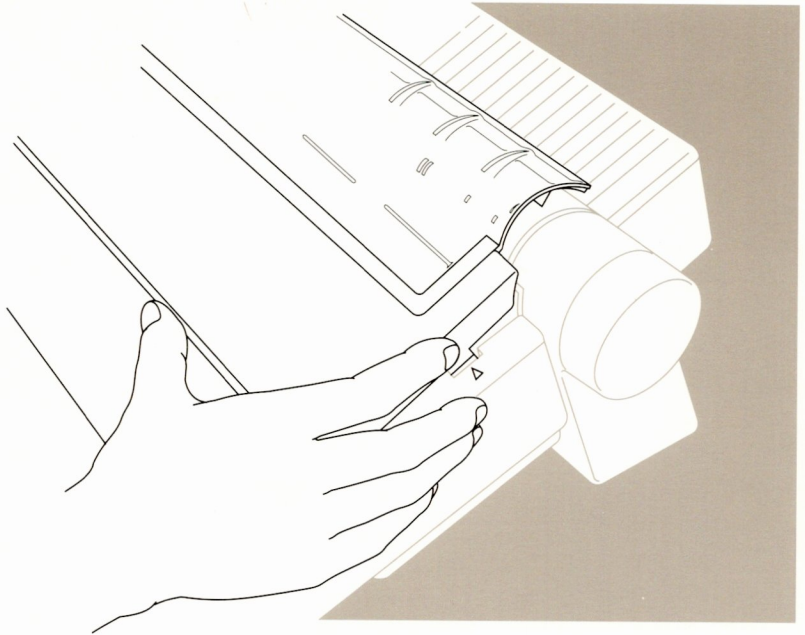
If you haven't already done so, remove the ImageWriter II from its carton. Reach *under* the printer with both hands and lift upward. For the moment, put the printer in a work area where you can easily get to its back side. Then follow these steps.

1. Remove all packing materials from the printer and return them to the carton. Save your shipping carton and packing materials, in case you need to store or ship your printer.
2. Place the printer ribbon and **power cord** beside the printer.



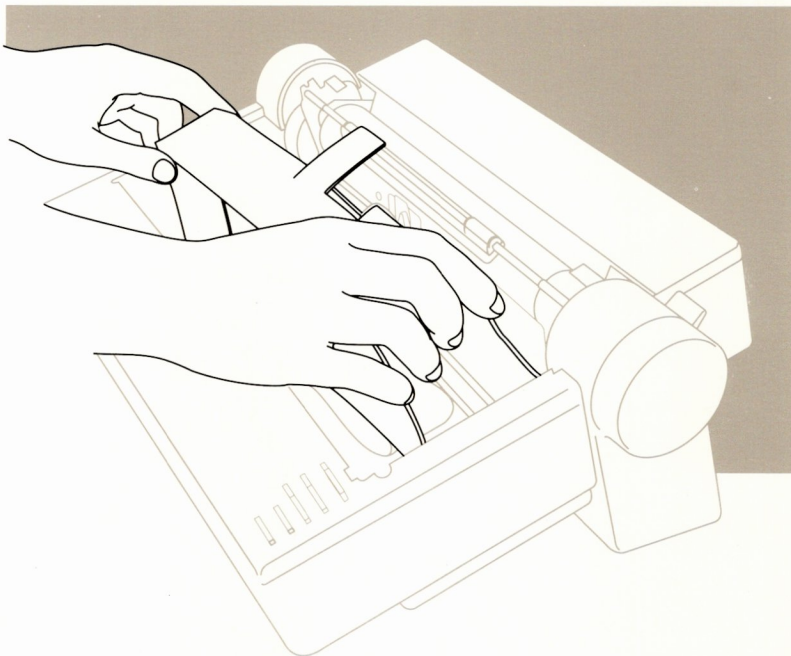
**Figure 2-1**  
Black ribbon and power cord

3. Remove all pieces of tape from the printer.
4. Take off the **front cover** by grasping its sides (at the arrow **icons**) and lifting upward. (See Figure 2-2.)



**Figure 2-2**  
Removing the front cover

5. Remove the cardboard retainer. The retainer keeps the **print head** from sliding around during shipping. Save it with your other packing materials. (See Figure 2-3.)



**Figure 2-3**  
Removing the cardboard retainer

❖ *Power sources:* When considering where to put your Apple system, keep in mind that the ImageWriter II requires its own power source. Depending on which Apple system you have, you may need three or more electrical outlets nearby—one each for the computer, monitor, and printer. Many people prefer to plug their computer equipment into a special power strip equipped with protection against surges in electrical current. See your authorized Apple dealer for information about power strips.

---

## Important safety instructions

You're almost ready to plug in your ImageWriter II and get started, but first read these important safety instructions.

For your own safety and that 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 becomes frayed or otherwise damaged
- if you spill anything into the case
- if your ImageWriter II is exposed to rain or any other excess moisture
- if your ImageWriter II has been dropped or if the case has been otherwise damaged
- if you suspect that your ImageWriter II needs service or repair
- whenever you clean the case (use only the recommended procedure described below)

**Be sure that you always do the following:**

- Keep your ImageWriter II away from sources of liquids, such as wash basins, bathtubs, shower stalls, and so on.
- Protect your ImageWriter II from dampness or wet weather, such as rain, snow, and so on.
- Read all the installation instructions carefully before you plug your ImageWriter II into a wall socket.
- Keep these instructions handy for reference by you and others.
- Follow all instructions and warnings dealing with your system.

---

**▲ Warning**

Electrical equipment may be hazardous if misused. Operation of this product, or similar products, must always be supervised by an adult. Do not allow children access to the interior of any electrical product and do not permit them to handle any cables. ▲

**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.

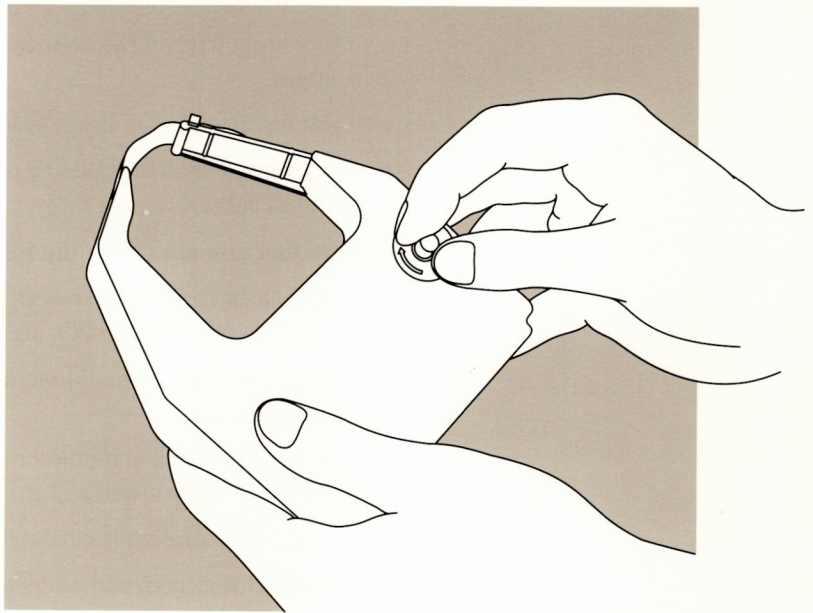
---

## Installing the ribbon cartridge

The black ribbon (provided with your ImageWriter II) and the color ribbon (purchased separately) are both continuous-loop fabric ribbons. They will not run out of ink, but the fabric will eventually wear out after a lot of use. Change the ribbon when text that you print starts to look faded.

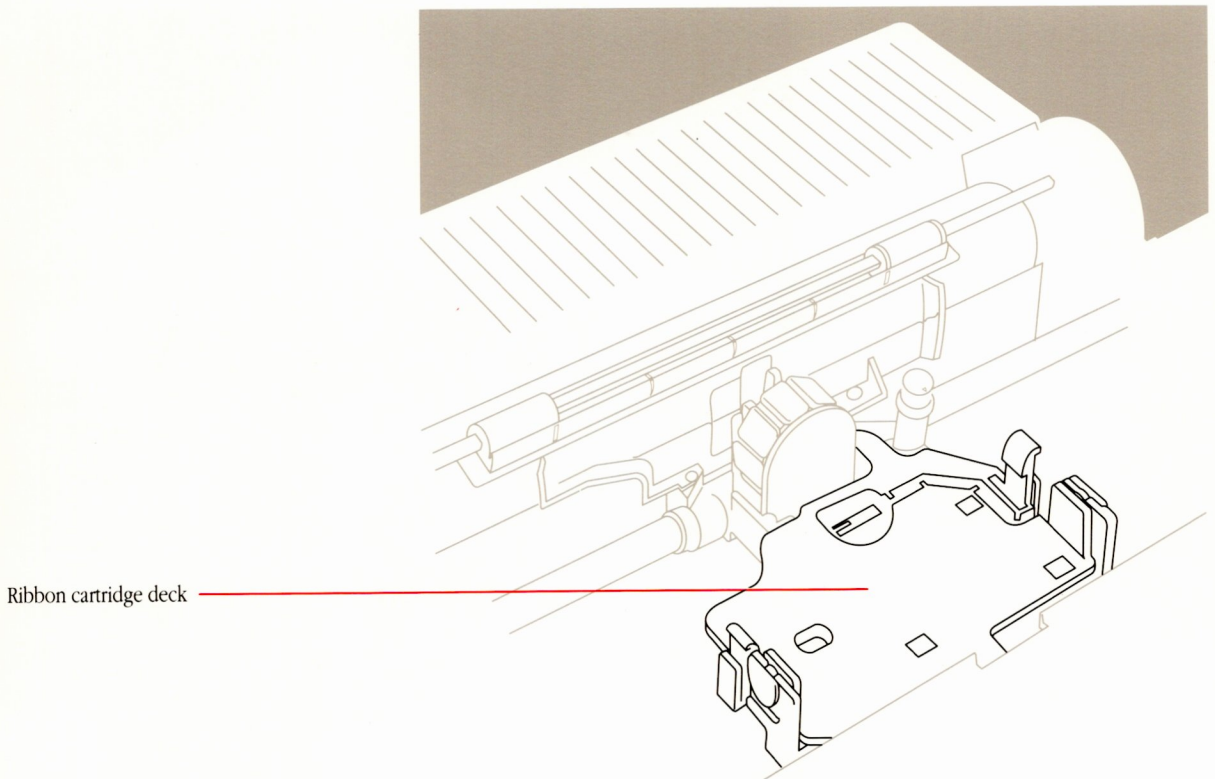
Installing the ribbon cartridge is simple. Here's how to do it.

1. Locate the ribbon knob on the ribbon cartridge and turn the knob clockwise to tighten the ribbon.



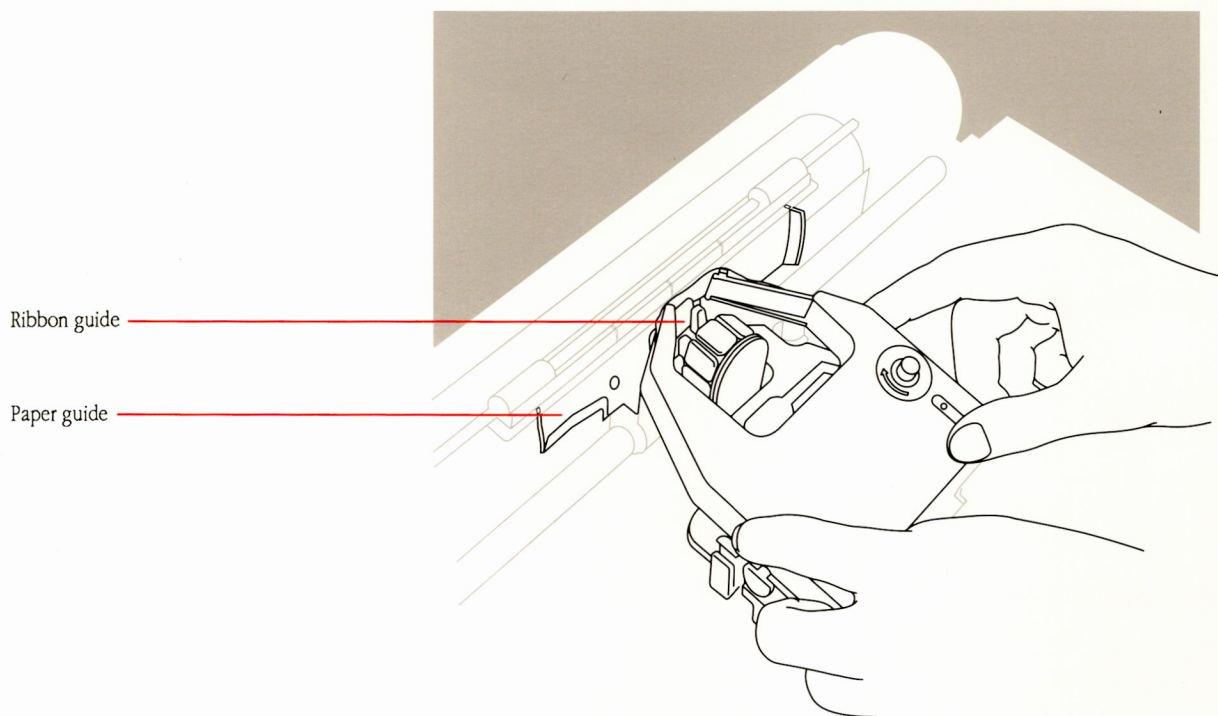
**Figure 2-4**  
Tightening the ribbon

2. If the **ribbon cartridge deck** is off to the side, gently slide it toward the center to give yourself some working room.



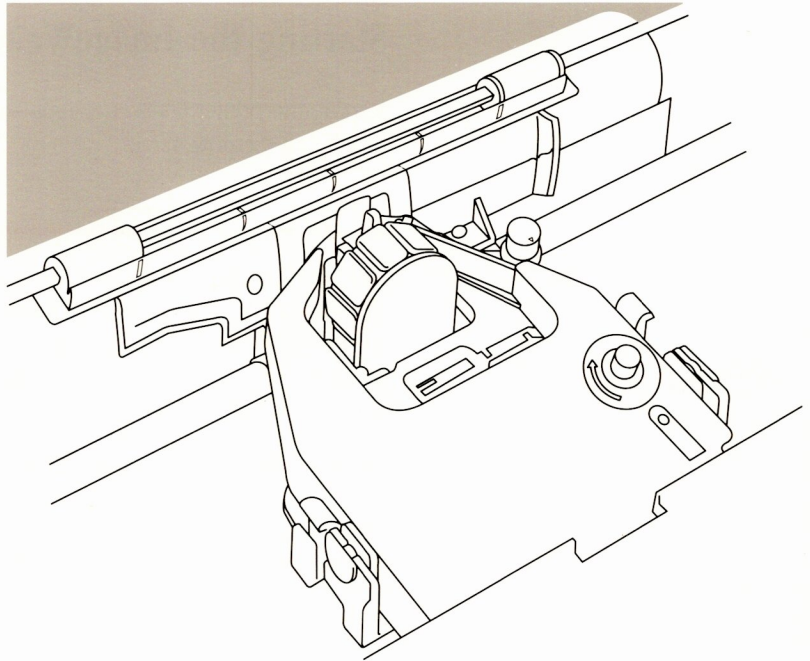
**Figure 2-5**  
Ribbon cartridge deck

3. Lower the ribbon cartridge onto the deck. Make sure that the ribbon slips between the plastic **ribbon guide** and the clear **paper guide**.



**Figure 2-6**  
Positioning the ribbon

4. When the ribbon is in position, gently press the cartridge between the two **cartridge support tabs**, so that the ribbon snaps into place. Make sure the ribbon is still positioned between the ribbon and paper guides. (See Figure 2-7.)



**Figure 2-7**  
Properly seated ribbon

5. Take any slack out of the ribbon by turning the ribbon knob clockwise.
  6. Replace the front cover on the printer by slipping the cover tabs into the receiving slots and pressing down on the cover.
- ❖ *Removing the ribbon cartridge:* To remove a ribbon, for repositioning or replacement, gently spread the support tabs and lift the cartridge out.

△ **Important** The printer does not function if the front cover is off or incorrectly mounted. However, you can run the printer when the **front cover window** is tilted open or removed. △

---

## Starting the ImageWriter II

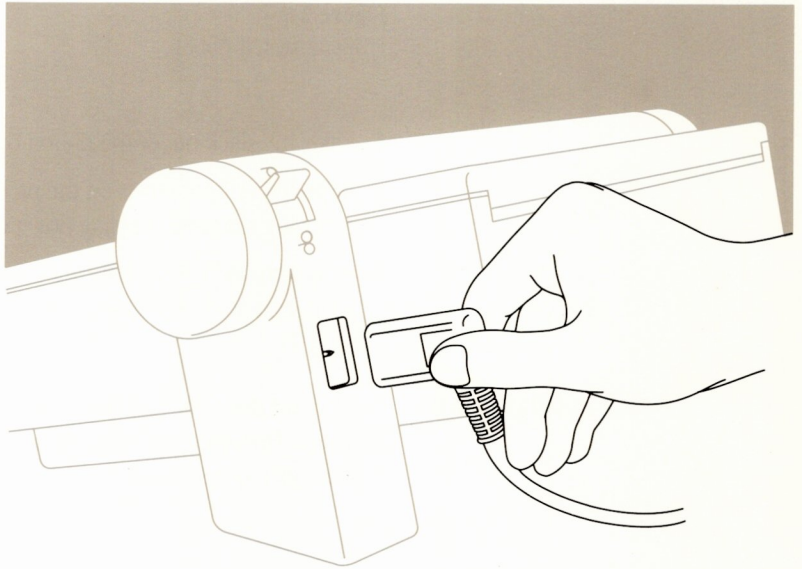
Starting the printer takes two steps—plugging in the power cord and turning on the power.

---

▲ **Warning** **This equipment is intended to be electrically grounded.** Your ImageWriter II is equipped with a three-wire grounding plug—a plug having a third (grounding) pin. This plug will fit only a grounded 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! ▲**

1. Plug the power cord into the ImageWriter II's **power socket** and plug the three-pronged end into the power outlet. (See Figure 2-8.)



**Figure 2-8**  
ImageWriter II power socket

2. Press the **On/Off switch**. (See Figure 2-9.) The green **Power light** and red **Error light** should light up. (The Error light is on because the printer is out of paper.) The print head moves to the left margin and then to the center. The ImageWriter II moves the print head to the center when no paper is present.

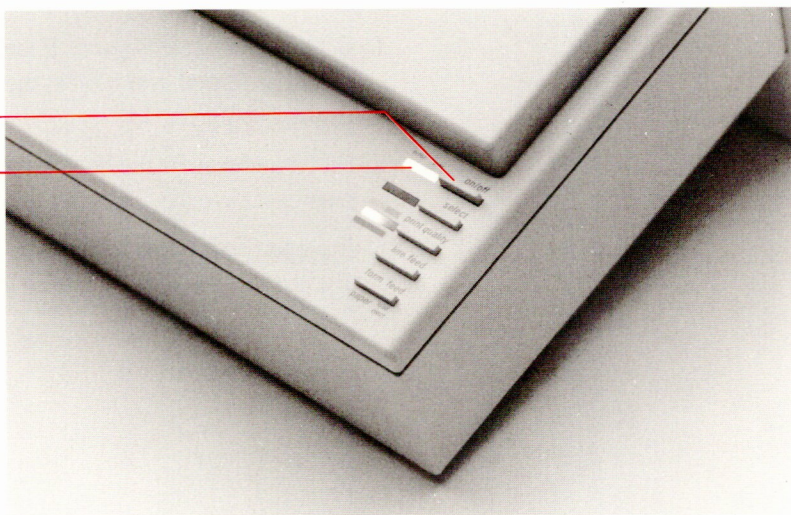
If nothing happens, check the following.

- Is the front cover in place?
- Press the On/Off switch again. Is the printer on now?
- Check the power cord connections. Is everything firmly plugged in?
- Has anything interrupted power to the wall socket or power strip?
- Does your power strip have an on-off switch? Does the wall socket?

If you're still having problems, see Chapter 6, "General Troubleshooting."

On/Off switch

Power light



**Figure 2-9**

The On/Off switch and related lights

---

## Loading paper

This section shows you how to load either **pin-feed paper** or single sheets of paper. The vertical sides of pin-feed paper have holes punched through them and there are perforations between sheets.

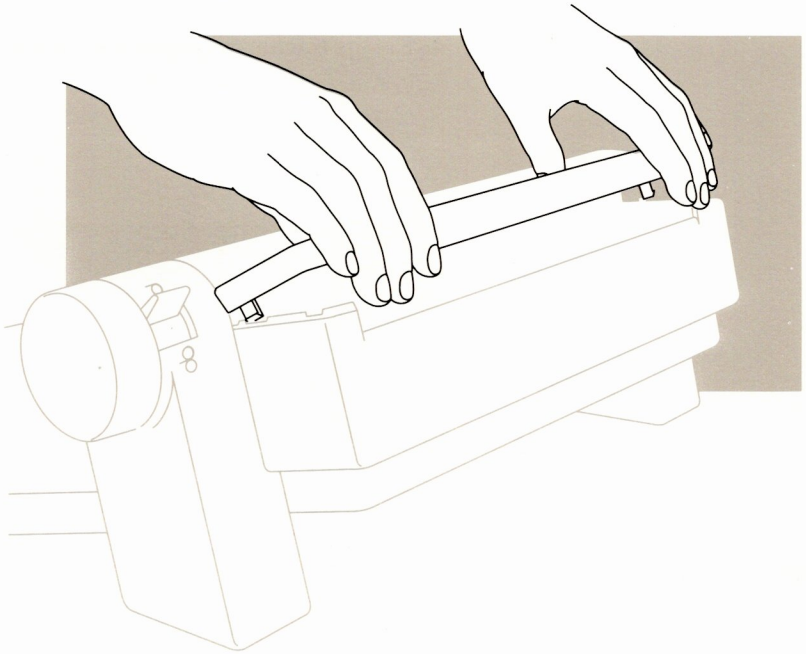
If you plan to use pin-feed paper or cut-sheet paper, go ahead and load that paper now using the instructions in one of the next sections. If, however, you plan to use the ImageWriter II SheetFeeder, multipart forms, envelopes, or labels most of the time, load a sheet of typing paper now so that you can complete the ImageWriter II self-test. Chapter 5 covers loading and printing on multipart forms, envelopes, and labels.

---

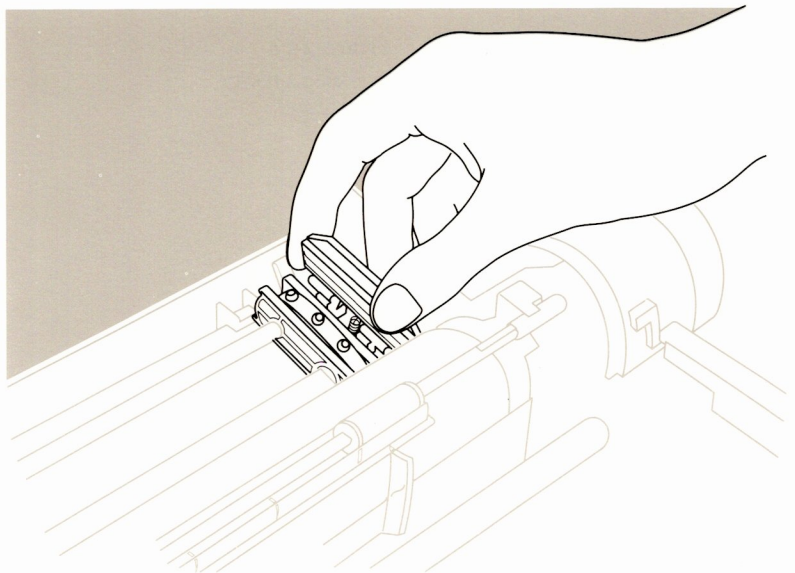
### Loading pin-feed paper

Loading pin-feed paper for the first time takes three steps: adjusting the **tractors** to accommodate your paper width, setting the printer to pin feed instead of friction feed, and rolling the paper in.

1. Get out your pin-feed paper. If the lead sheet is torn, wrinkled, or otherwise flawed, tear it off at the next perforation to present a clean edge to the printer.
2. Lift up and remove the **back cover** to get to the tractor, the device that pulls paper into the printer. Set the cover aside. (See Figure 2-10.)
3. Flip open both **paper clamps** by lifting them in an outward direction. The clamps should spring into an upright position. (See Figure 2-11.)

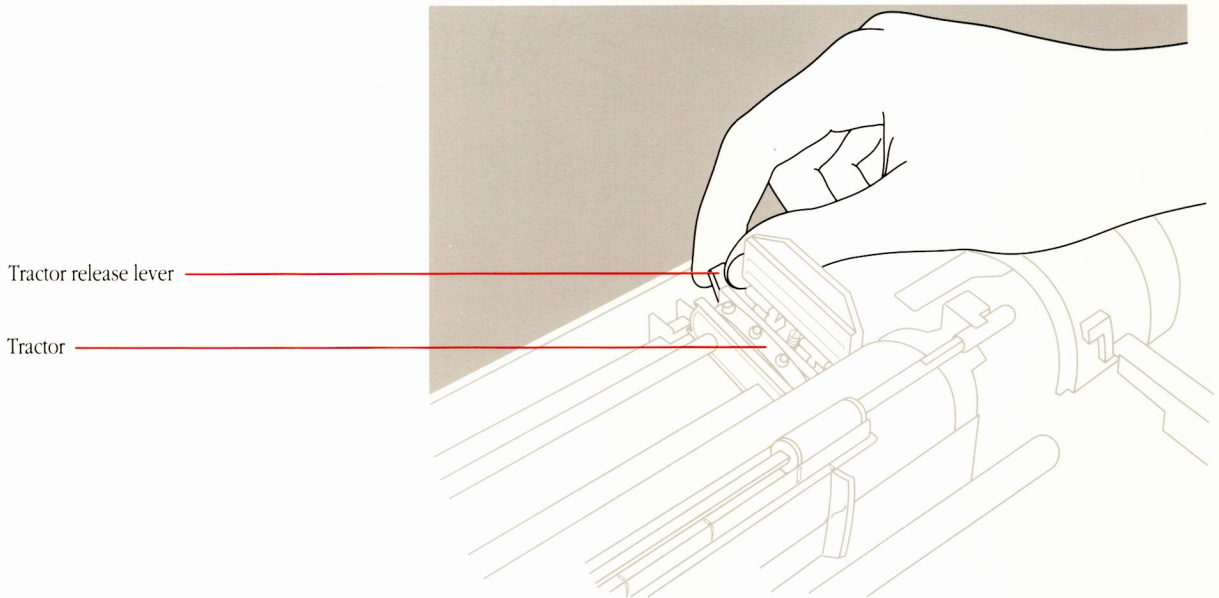


**Figure 2-10**  
Removing the back cover



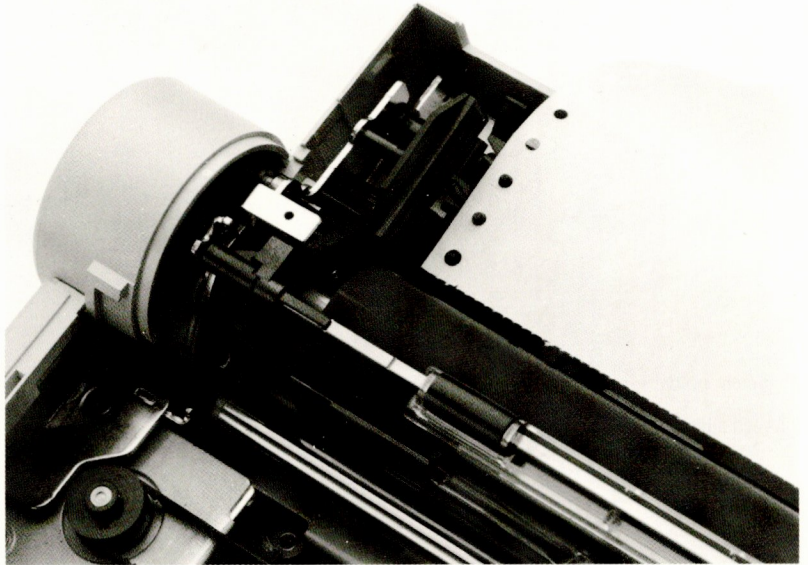
**Figure 2-11**  
Opening a paper clamp

4. Flip the **tractor release levers** into the up position by pushing them toward the front of the printer. (See Figure 2-12.) This frees the tractors so you can adjust them to the width of your paper.



**Figure 2-12**  
Releasing a tractor

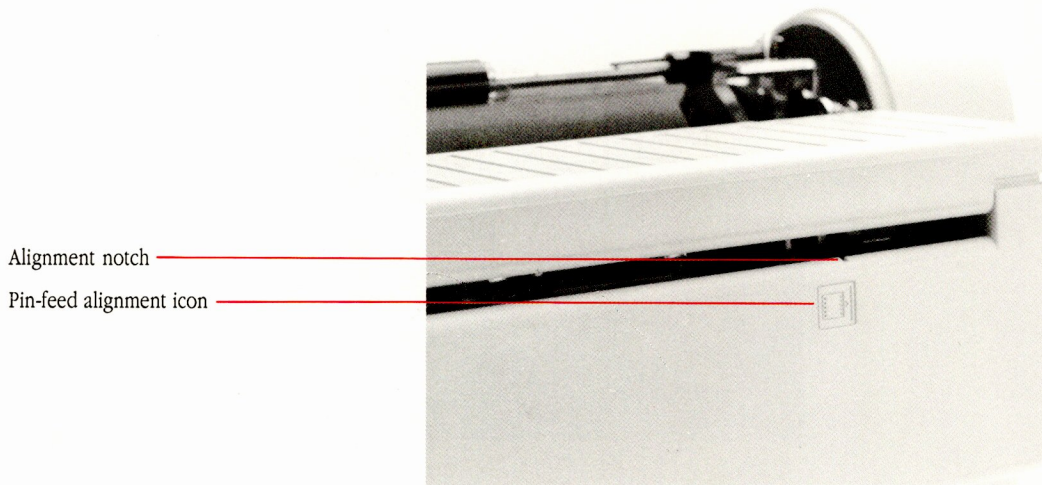
5. Lay down the lead sheet of paper so that the first three pins on the left-margin tractor poke through the first three pin holes on the left side of the paper. (See Figure 2-13.) Don't worry about the other side of the paper for the moment.



**Figure 2-13**  
Loading pin-feed paper

6. Close the left-margin paper clamp over the paper.
7. Find the **pin-feed alignment icon** on the back panel of the printer and the **alignment notch** directly above it. (See Figure 2-14.) Slide the tractor until the paper edge (not the perforation) is lined up with the notch and the vertical line on the icon.

With the paper properly aligned, printing begins ¼ inch from the perforation.

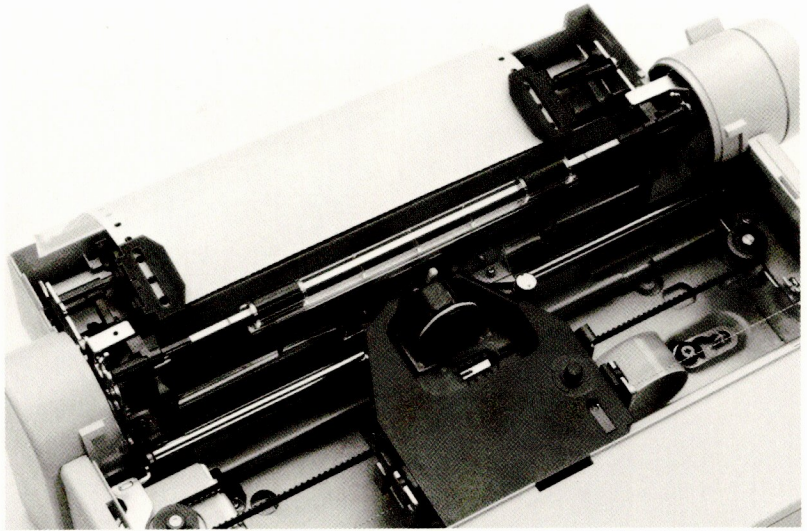


**Figure 2-14**

The pin-feed alignment icon

8. With the tractor and paper properly aligned, lock the left-margin tractor in place by pressing its lever into the down position.
9. Slide the other (right-margin) tractor so that its top three pins come up through the paper's first three holes.
10. Close the paper clamp and gently slide the tractor as far as necessary to take the slack out of the paper.

11. Press the right-margin tractor release lever into the down position.  
Figure 2-15 shows a properly aligned sheet of pin-feed paper.

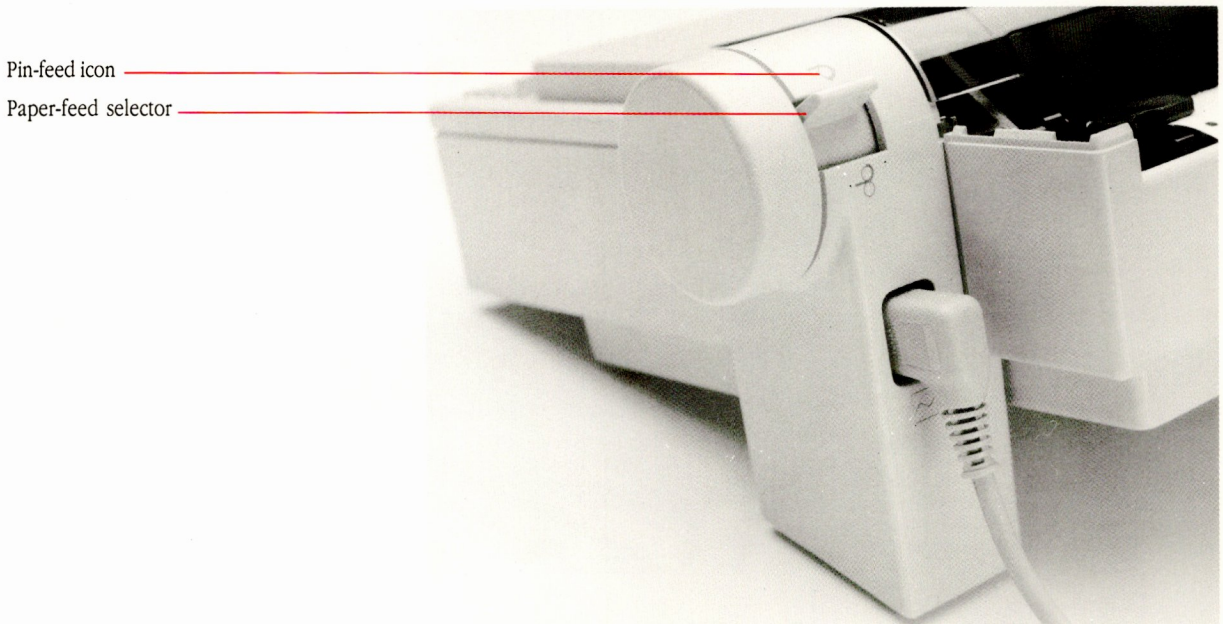


**Figure 2-15**

Pin-feed paper on the tractor

- ❖ *By the way:* Starting a fresh stack of pin-feed paper involves only opening the paper clamps, dropping the paper onto the pins, and closing the clamps. You'll need to readjust the tractor position only when you use paper with a different width.

12. Set the **paper feed selector** (located next to the **platen knob**) to the up position for pin feed. (See Figure 2-16.)



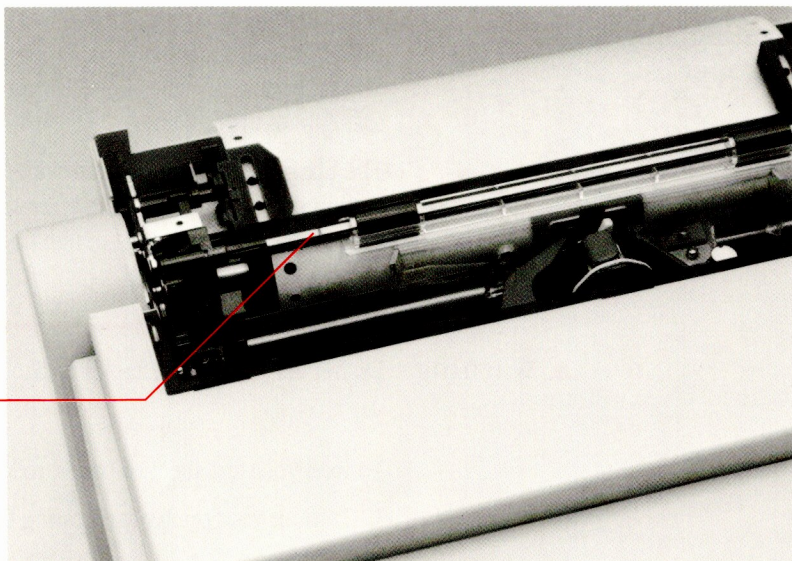
**Figure 2-16**

Paper feed selector set for pin feed

13. To load the paper into the printer, turn the platen knob clockwise until the leading edge of the paper is between the platen and the **paper bail**. (See Figure 2-17.)

Setting the top edge of the paper under the paper bail positions the paper so that you can tear off the last printed sheet without wasting a page.

Paper bail



**Figure 2-17**

Paper loaded under the paper bail

14. Put the back cover on.

With the top edge of the paper under the paper bail, printing begins approximately 1 inch from the top of the paper.

If you print from a Macintosh, however, the paper will usually roll back about  $\frac{3}{8}$  inch before printing begins. This makes it possible to get a top margin that is less than 1 inch.

You may also find that the application software you're using lets you set additional margins. The margin you set in an application is added on to the margin you set by placing the paper under the paper bail. Chapter 5 gives some tips on resetting software top margins.

When the paper is satisfactorily loaded, jump ahead to the section "Running the ImageWriter II Self-Test" toward the end of this chapter.

---

## Loading single sheets of paper

When loading single sheets of paper, you can take advantage of the ImageWriter II's automatic paper-loading feature. Slip in a piece of paper, press a button, and the printer automatically positions the paper for printing to begin on the first line.

The ImageWriter II works best with 16- to 24-pound bond. If you need to work with lighter papers (like onionskin), be sure to insert one or more backup sheets to provide enough thickness for the friction-feed mechanism.

---

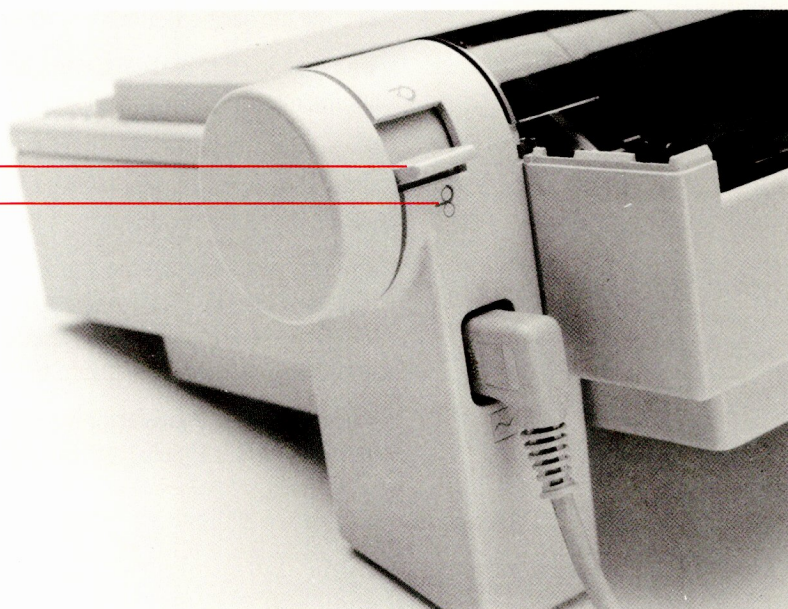
▲ **Warning** Do not use paper with staples or paper clips in your ImageWriter II. ▲

To load your test sheet of paper, follow these steps.

1. Turn on your printer by pressing the On/Off switch.
2. Set the **paper feed selector** (located next to the **platen knob**) to the down position for friction feed. (See Figure 2-18.) Choosing friction feed turns off the pin-feed mechanism.

Paper feed selector

Friction-feed icon

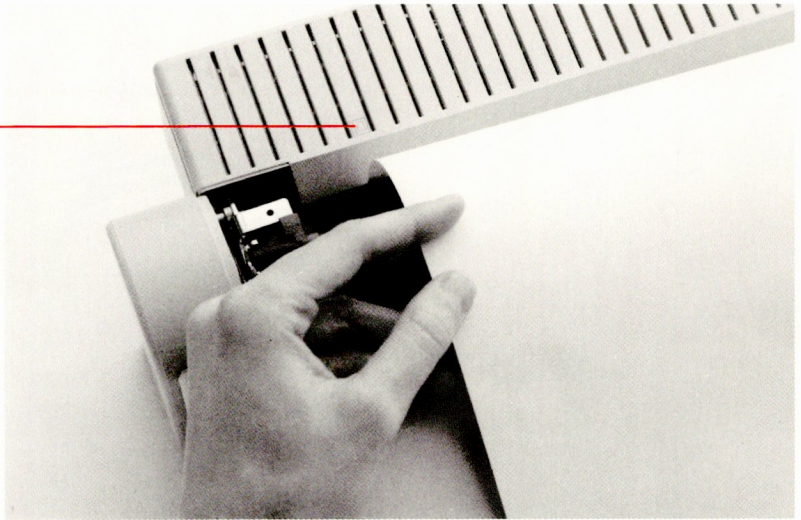


**Figure 2-18**

Paper feed selector set for friction feed

3. Slip the sheet of paper between the back cover and **platen**.
4. Find the single-sheet icon located near the left side of the back cover and place the paper so that it lines up with the vertical line on the icon. (See Figure 2-19.)

Single-sheet alignment icon



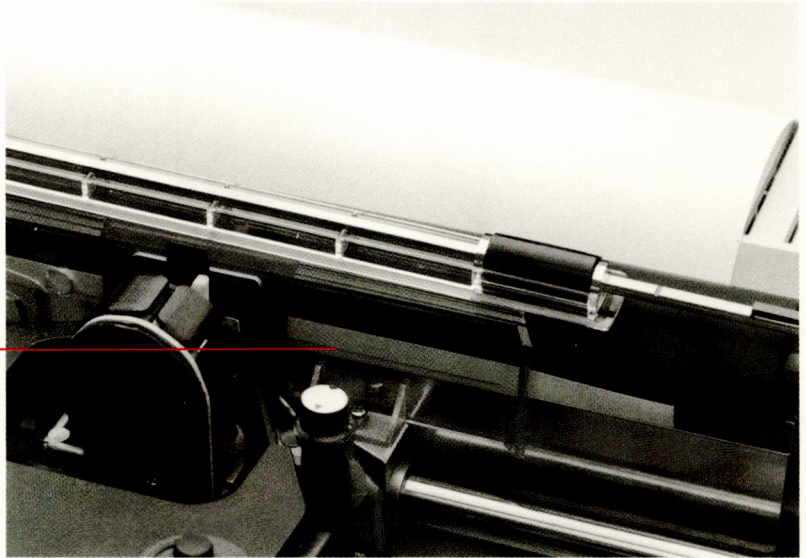
**Figure 2-19**

Aligning a single sheet of paper

5. Make sure that the paper is straight (just as you do when putting paper in a typewriter) and in deep enough for the platen to grip the paper.

6. Press the **Form Feed button** to load the page automatically. The ImageWriter II rolls the paper and positions it for printing on the first line of the page (indicated by the **print line** on the plastic paper guide).

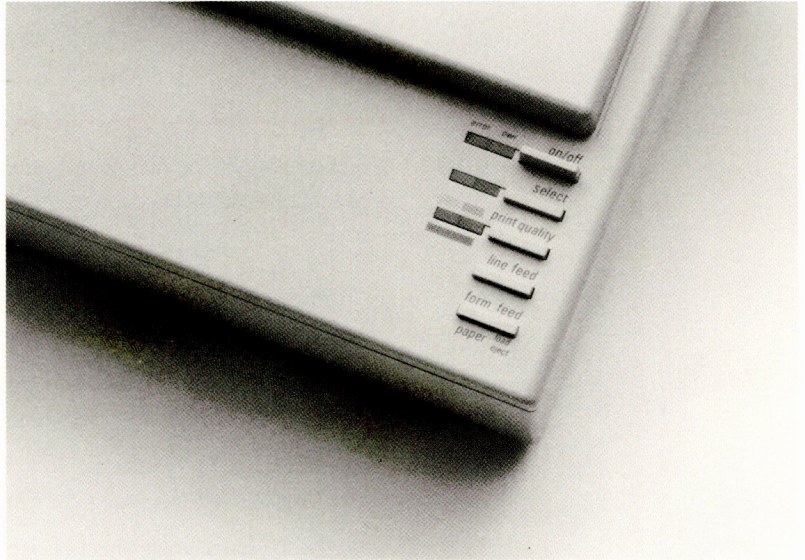
Print line



**Figure 2-20**  
Print line

If the paper doesn't load, check the **Select light**. It should be off. If the Select light is on, press the **Select button** and then the Form Feed button.

If the Error light did not go out after you loaded the paper, the paper probably didn't roll far enough into the printer. Turn the platen knob clockwise until the Error light goes out.



**Figure 2-21**  
Select and Form Feed buttons

- ❖ *By the way:* Although most people prefer automatic paper loading, you can crank the paper in by hand with the platen knob.

---

## Running the ImageWriter II self-test

Now that you have correctly loaded paper into your ImageWriter II, you're ready to run its self-test—a repeated printing of the ImageWriter II **character set**. When your ImageWriter II passes the test, you will know that any problems that might arise have developed in the software, the computer, or in the connection between the computer and printer.

❖ *Color testing:* If you have installed the color ribbon, this test will print all the colors the ImageWriter II can generate.

---

▲ **Warning** Never print when the ribbon and paper are not in place. Repeated printing on a bare platen can damage the platen and the printing element. ▲

1. Turn the ImageWriter II off by pressing the On/Off switch.
2. To start the self-test, press the Form Feed button and hold it down while you press the On/Off switch. Release both buttons simultaneously. As soon as the print head moves to the left margin, the printer will begin printing.
3. To stop the self-test, press the On/Off switch to turn the printer off.
4. If you loaded a single sheet of paper, roll the test page out by turning the platen knob.
5. If you have loaded pin-feed paper, roll the paper forward to position the perforation under the paper bail. This ensures that when you turn the printer back on, printing will begin an inch from the top. Tear off the test sheet.

ROM rev level —  
DIP switch settings

• BOMBAY (03)

- DIPSW1(00000100) DIPSW2(1101), '1=ON,0=OFF'

RAM= 0 KB AT=ON

[illegible]

**Figure 2-22**  
The ImageWriter II self-test

Examine the **printout** carefully.

- Are all characters complete?
- Are all characters well aligned?
- Is the spacing between characters and lines even?
- Are all the lines equally dark from beginning to end?

If you notice any problems, check this troubleshooting list to see if the ribbon is properly installed and the paper correctly loaded.

- Is the ribbon cartridge firmly seated in its carrier?
- Does the printing area of the ribbon lie between the ribbon guide and the paper guide?
- Is the ribbon loose?
- Is the paper straight?

Correct any problems and try the test again. If there's still a problem, see Chapter 6, "General Troubleshooting." If Chapter 6 doesn't help, contact your authorized Apple dealer.

---

## What's next

If your printer passed the test, you're ready to connect it to your computer or **network**. Go on to Chapter 3 to connect a Macintosh Plus, Macintosh SE or Macintosh II. Go to Chapter 4 to connect an Apple II computer. Go to Appendix A to connect a Macintosh 128K, a Macintosh 512K, or a Macintosh 512K Enhanced.

If you plan to connect your ImageWriter II to a LocalTalk network, see the *ImageWriter II/LQ LocalTalk Option User's Guide*.

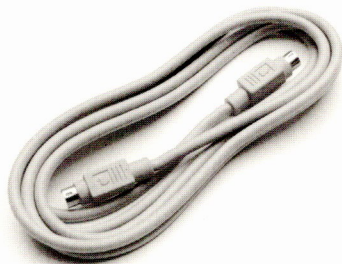
Once you've connected the ImageWriter II to your computer or network, if you have an ImageWriter II SheetFeeder, see the manual for the SheetFeeder to learn how to install this option.

---

## Connecting to Your Macintosh Computer

**T**HIS CHAPTER SHOWS YOU HOW TO CONNECT THE IMAGEWRITER II TO A Macintosh Plus, Macintosh SE, or Macintosh II computer. If you want to connect an older Macintosh computer, see Appendix A. If you want to connect the ImageWriter II to an Apple II computer, skip ahead to Chapter 4. If you plan to connect the ImageWriter II to an AppleTalk network system with a LocalTalk cable system, see the *ImageWriter II/LQ LocalTalk Option User's Guide*, then return to Chapter 5 in this book.

After you've connected the printer to your computer, this chapter goes on to tell you how to test the connection. The test verifies that the computer can send data to the printer and that the printer can print the data. Once the connection passes the test, if a problem arises, you know the problem is not with the way you connected the printer. You can trace the trouble to two *probable* areas: a connection came loose, or an application you're using (a word processing program or **spreadsheet**, for example) is improperly configured. To **configure** an application means to adjust its settings to match the requirements of another piece of software or a device (the ImageWriter II, for example).



**Figure 3-1**  
System/Peripheral-8 Cable

---

## Before you begin

This chapter assumes that you have installed the printer ribbon and loaded paper into the printer. You should also have completed a successful self-test of the ImageWriter II. If you have not completed these steps, see Chapter 2.

Before continuing, make sure you have the correct cable (the System/Peripheral-8 Cable).

---

### ▲ Warning

If your **serial interface cable** does not have the proper connectors, don't try to make it fit; see your authorized Apple dealer before continuing. ▲

A **printer resource** is a program that translates the files you print into the language that the printer understands.

To connect the ImageWriter II to your Macintosh Plus, Macintosh SE, or Macintosh II, you'll complete these four steps:

1. Check to make sure you have the correct ImageWriter II **printer resource** (also called the *printer driver*).
2. Plug the printer cable into the printer and the Macintosh.
3. Use the Chooser desk accessory to prepare your Macintosh to use the ImageWriter II.
4. Test the connection between the printer and the computer.

---

## Checking your resource file

A **startup disk** is any disk (3.5 inch or hard disk) that has all the necessary files—such as the Finder and System files contained in the System Folder—to set the computer into operation.

In order to use the ImageWriter with a Macintosh computer, you must have an ImageWriter printer resource in the System Folder on any disk that you use as a **startup disk**.

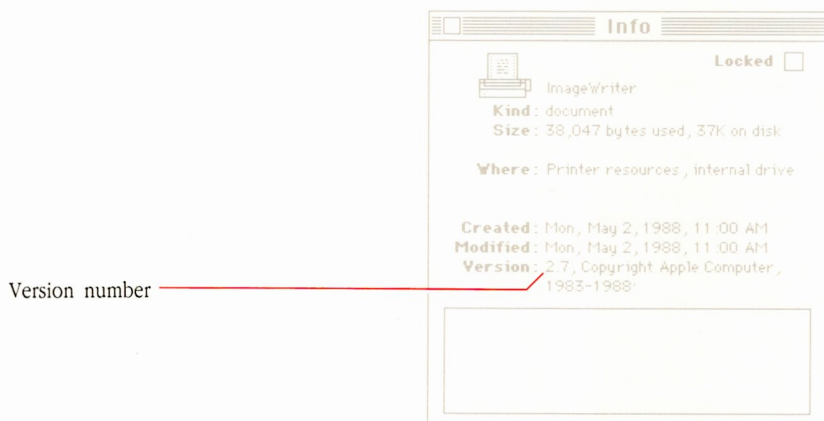
To find out if you have an ImageWriter II resource file, open the System Folder on your startup disk. You should see a file there named ImageWriter. If you do, you have the software you need. If not, you need to add the file to your System Folder. Your authorized Apple dealer sells System Software Updates that come with instructions on installing the software you need. Follow the instructions given with that package to install the ImageWriter resource on your startup disks.

---

## Old software?

If your system software is more than a year old, you may want to update it. Apple periodically updates system software to improve performance and fix problems.

To find out if you need to update your ImageWriter resource, open your System Folder, select the ImageWriter icon, and choose Get Info from the File menu. A window will appear that gives you information about your ImageWriter resource. The box at the bottom of the window tells you the version number for the ImageWriter resource (see Figure 3-2).



**Figure 3-2**  
Get Info window

If the version number is less than 2.7, you'll probably want to update your system software. To update the ImageWriter resource on your startup disks, obtain a System Software Update from your authorized Apple dealer and follow the instructions given with that package.

---

## Making Macintosh cable connections

With the correct printer resource installed, you can go on to connect the System/Peripheral-8 cable to your ImageWriter II and your Macintosh computer.

---

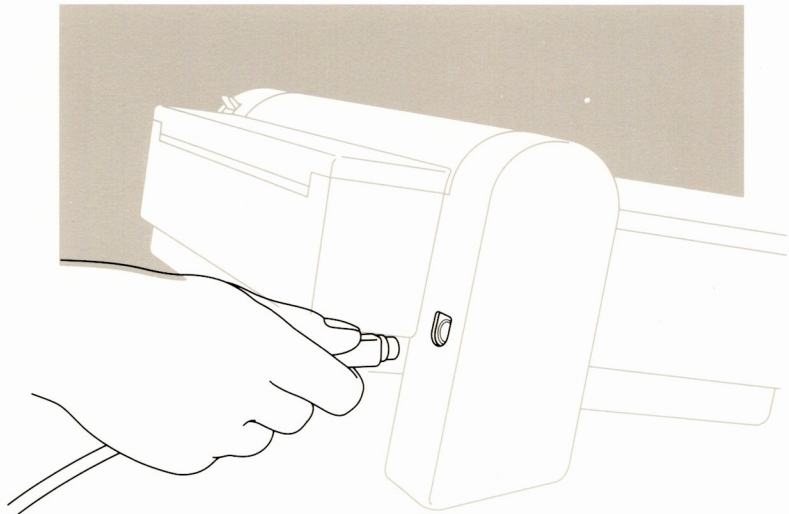
### ▲ Warning

Always make sure you have turned off both the computer and a peripheral device, such as a printer, before connecting or disconnecting them. Changing cables when the power is on can damage your equipment. ▲

1. Plug one end of the printer cable (both ends are the same) into the ImageWriter II's **serial interface socket**. (See Figure 3-3.)

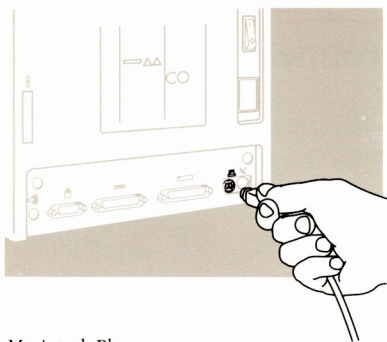
Make sure you get a firm fit. Loose connections can interfere with radios and televisions, scramble data, and even stop printing.

2. Hold the free end of the cable with the Apple logo facing up.

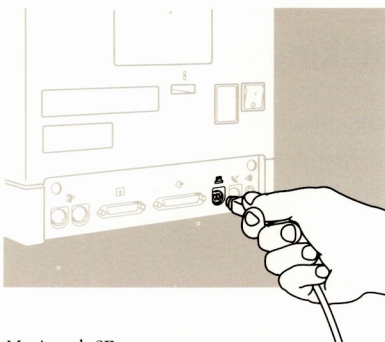


**Figure 3-3**

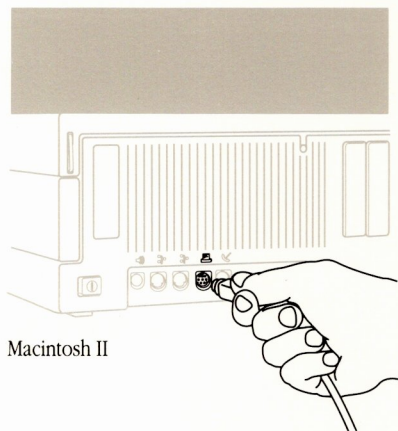
Plugging the printer cable into the printer



Macintosh Plus



Macintosh SE



Macintosh II

**Figure 3-4**

Connecting the printer cable to the Macintosh printer port

3. Plug the connector into the Macintosh printer **port**. (See Figure 3-4.) If another connector (such as LocalTalk) occupies the printer port, connect to the **modem** port.

---

## Selecting the ImageWriter II in the Chooser

With the printer resource installed and the printer cable connected to your printer and computer, you're ready for the final step—telling the computer what kind of printer you want to use, and which port you used to connect that printer. To do this, you use the Chooser desk accessory.

1. Make sure you have a startup disk in a drive, and then turn on the Macintosh. You can also start up using your hard disk if you have one.
2. Pull down the Apple menu and check that a desk accessory called Chooser is available. If it is not available, you need to update your system software. See your authorized Apple dealer to obtain a System Software Update and follow the instructions given with that package.
3. Select Chooser from the Apple menu.
4. Select the ImageWriter icon.
5. If you have connected the ImageWriter II to the printer port, choose the printer port icon. If you have connected the ImageWriter II to the modem port, choose the modem port icon.
6. Click the close box to save your configuration and put the Chooser window away.

You're ready to test the connection between the ImageWriter II and your Macintosh.



ImageWriter

**Figure 3-5**

The ImageWriter icon

---

## Testing Macintosh connections

Follow these steps to make sure that the connections between your printer and computer are working.

1. Press the Caps Lock key into its down position.
2. Hold down the Command and Shift keys while you press 4.

Your ImageWriter II should start printing the contents of the current Macintosh screen.

If it does not, check to make sure that both ends of the printer cable fit firmly into their ports. Also, open the Chooser and make sure that you've selected the ImageWriter icon and the icon for the correct port—either the printer or the modem port. Then go back and try the test again.

If the test still doesn't run, see Chapter 6, "General Troubleshooting."

---

## Connecting to Your Apple II Computer

**T**HIS CHAPTER SHOWS YOU HOW TO CONNECT YOUR IMAGEWRITER II TO AN Apple IIGS, Apple IIe, Apple IIc, Apple II Plus, and Apple II computer. If you want to connect your printer to a Macintosh Plus, Macintosh SE, or Macintosh II, see Chapter 3. If you want to connect an older Macintosh computer, see Appendix A. If you plan to connect the ImageWriter II to an AppleTalk network system with a LocalTalk cable system, see the *ImageWriter II/LQ LocalTalk Option User's Guide*, then return to Chapter 5 in this book.

To **configure** an application means to adjust its settings to match the requirements of another piece of software or a device (the ImageWriter II, for example).

After you've connected the printer to your computer, this chapter goes on to tell you how to test the connection. The test verifies that the computer can send data to the printer and that the printer can print the data. Once the connection passes the test, you'll know that any problem that arises is not caused by the way you connected the printer. You can trace the trouble to two probable areas: a loose connection or an improperly **configured** application (a word processing program or **spreadsheet**, for example).

---

## Before you begin

This chapter assumes that you have installed the printer ribbon and loaded paper into the printer. You should also have completed a successful self-test of the ImageWriter II. If you have not completed these steps, see Chapter 2.

Before continuing, make sure you have the correct cable for your computer:

- System/Peripheral-8 Cable for the Apple IIGS
- Apple IIc Peripheral-8 Cable for the Apple IIc
- Apple IIe Printer-8 Cable for the Apple II, Apple II Plus, or Apple IIe

---

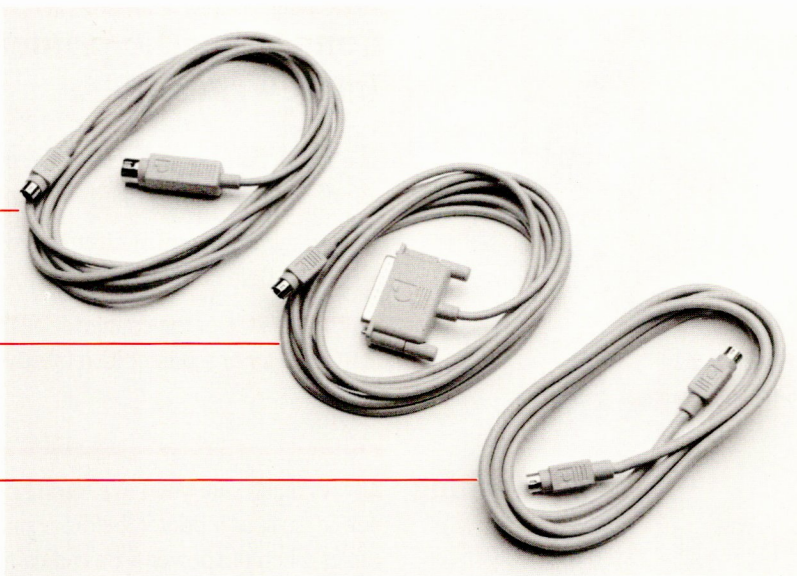
### ▲ **Warning**

If your serial interface cable does not have the proper connectors, don't try to make it fit; see your authorized Apple dealer before continuing. ▲

Apple IIc Peripheral-8 Cable for the  
Apple IIc

Apple IIe Printer-8 Cable for the  
Apple II, Apple II Plus, and Apple IIe

System/Peripheral-8 Cable for the  
Apple IIGS



**Figure 4-1**  
Apple II serial interface cables

To connect the ImageWriter II to your Apple II computer you'll follow these three steps:

1. Plug the printer cable into the ImageWriter II.
2. Install your serial interface card (not necessary on the Apple IIGS or Apple IIc).
3. Plug the printer cable into your Apple II computer.
4. Test the connection.



**Figure 4-2**  
8-pin mini-circular connector

---

## Connecting the printer cable to the ImageWriter II

The instructions for connecting the printer cable to the printer are the same for all Apple II computers. Just follow these two steps:

1. Find the **8-pin, mini-circular connector** on one end of your printer cable. (Both ends are the same for the Apple IIGS cable.)

The top side of the connector bears an Apple icon (for the Apple IIGS and Apple IIc) or a printer icon (for the Apple II, II Plus, and IIe).

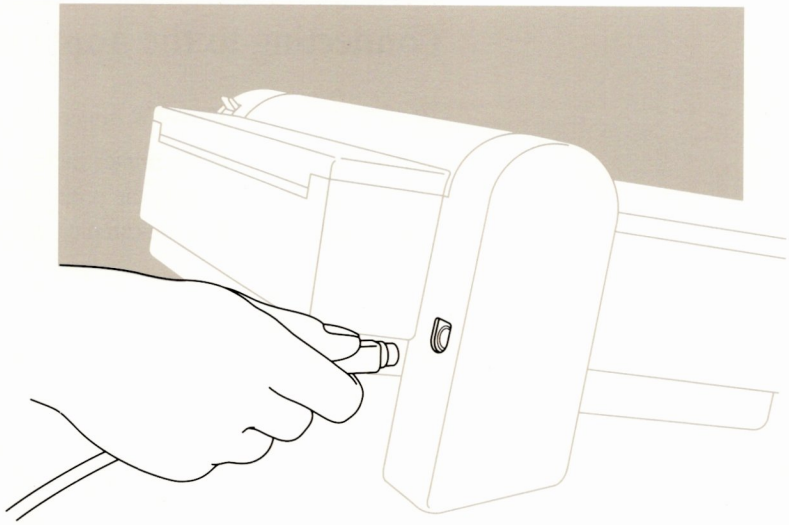
---

### ▲ **Warning**

Always make sure you have turned off both the computer and a peripheral device, such as a printer, before connecting or disconnecting them. Changing cables when the power is on can damage your equipment. ▲

2. Plug the connector into the ImageWriter II's **serial interface socket**. (See Figure 4-3.)

Make sure you get a firm fit. Loose connections can interfere with radios and televisions, scramble data, and even stop printing.



**Figure 4-3**

Plugging the printer cable into the printer

Now find the section of this chapter that discusses your computer. Instructions follow in this order:

- Apple IIGS
- Apple IIc
- Apple II, II Plus, and IIe

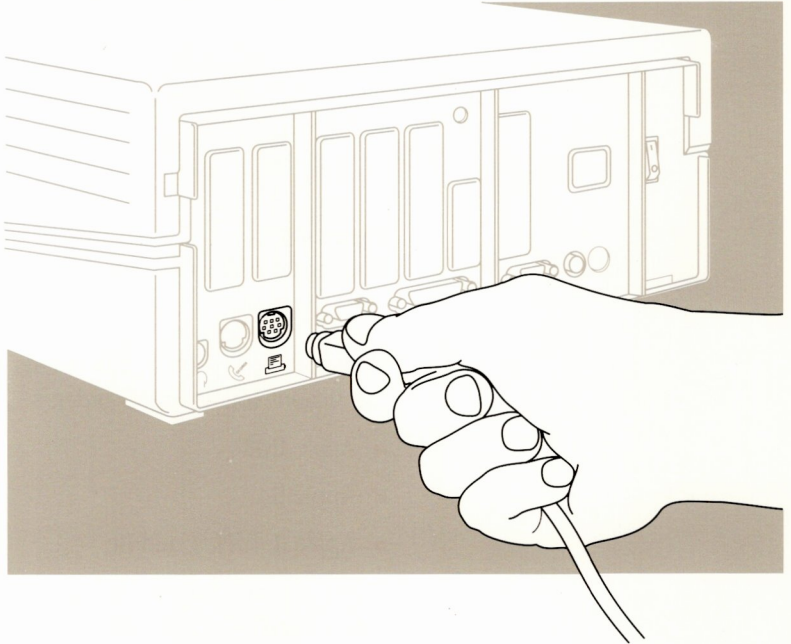
If you're connecting the ImageWriter II to an AppleTalk network system with a LocalTalk cable system, see the documentation that comes with the ImageWriter II/LQ LocalTalk Option.

---

## Connecting to the Apple IIGS

To connect your printer to the Apple IIGS, follow these steps.

1. Plug the free end of the printer cable into the printer **port** on the computer. If you're using the printer port for another connector (like a LocalTalk connector), you can plug the printer cable into the **modem** port.

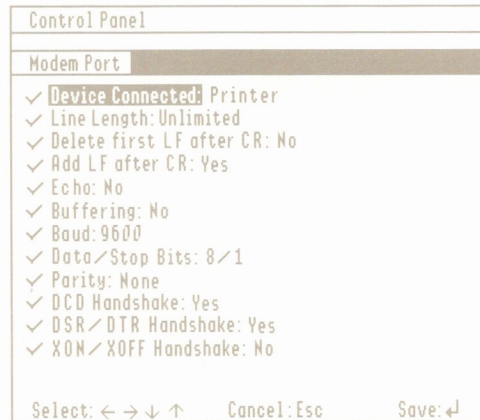


**Figure 4-4**  
Connecting the cable to the Apple IIGS

- If you connected the ImageWriter II to the printer port, you're finished connecting the printer. Go on to "Testing Apple IIGS Connections" just ahead.
- If you connected the printer to the modem port, you must use the Control Panel program to set your computer for this configuration. Go on to step 2.

The Command key is the key with the Apple symbol and the propeller symbol.

2. To get to the Control Panel program, turn the computer on and press Control-Command-Esc.
3. Press Down Arrow until the modem port option is highlighted. Press Return.
4. Match the settings to those in Figure 4-5. Use Up Arrow and Down Arrow to highlight the setting you want to change. Then use Left Arrow and Right Arrow to select the setting that matches Figure 4-5.



**Figure 4-5**  
Apple IIGS Control Panel settings

5. When all of the settings match Figure 4-5, press Return to save the settings. You'll return to the Main Menu.
6. Choose Quit.

You've finished connecting the printer to the Apple IIGS. You can now go on to test the connection.

---

## Testing Apple IIGS connections

Follow these steps to make sure that the connections between your printer and computer are working.

1. Remove any disks from the disk drives.
2. Turn the computer off, and then on again. Turn on the monitor and the printer. Make sure the select light is on. Ignore the “Check Disk Drive” message.
3. Press Control-Reset. The **Applesoft BASIC** prompt appears: `]`.
4. To send keyboard **output** to the printer, type `PR#1` and press Return.
5. Type any characters you want; `This is a test` will do. (These characters will not appear on the screen.) Press Return to send this message to the printer.

The ImageWriter II should respond by printing the characters you typed and the words “SYNTAX ERROR.” Don't worry about the error message. When you tested the printer you were actually typing in a programming language called BASIC. The error message just indicates that you didn't enter a proper BASIC command. (You weren't trying to.)

As long as the message printed, the connection passed the test. If it did not, check to make sure that both ends of the printer cable fit firmly into their ports and try the test again. If nothing happens, see Chapter 6, “General Troubleshooting.”

6. To return output to the screen, press Control-Reset.

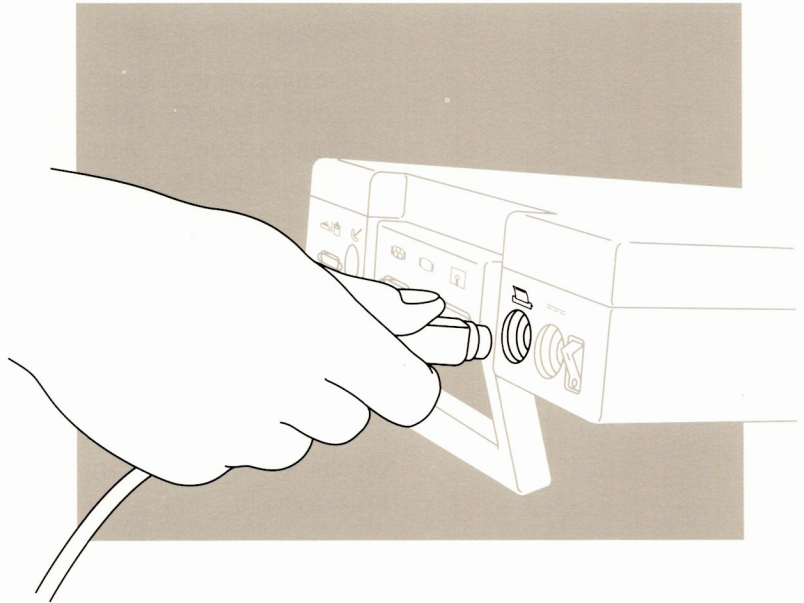
You can now skip ahead to Chapter 5 to find out how to get the most out of your ImageWriter II.

---

## Connecting to the Apple IIc

This is a very straightforward operation; just plug in the cable and test the connection.

1. Plug the free end of the printer cable firmly into the Apple IIc printer port. (See Figure 4-6.)



**Figure 4-6**  
Plugging the printer cable into the Apple IIc

2. Now test the connection. Remove any disks from the disk drives.
3. Turn on the monitor.
4. Turn on the printer and make sure that the Select light is on.
5. Turn on the computer; ignore the “Check Disk Drive” message.
6. Press Control-Reset. The **Applesoft BASIC** prompt appears: `]`.
7. To send keyboard **output** to the printer, type `PR#1` and press Return.
8. Type any characters you want; `This is a test` will do. Note: These characters will not appear on the screen. Press Return to send this message to the printer.

The ImageWriter II should respond by printing the characters you typed and the words “SYNTAX ERROR.” Don’t worry about the error message. When you tested the printer you were actually typing in a programming language called BASIC. The error message just indicates that you didn’t enter a proper BASIC command. (You weren’t trying to.)

As long as the message printed, the connection passed the test. If it did not, check to make sure that both ends of the printer cable fit firmly into their ports and try the test again. If nothing happens, see Chapter 6, “General Troubleshooting.”

9. To return output to the screen, press Control-Reset.

Go now to Chapter 5 to learn how to get the most out of your ImageWriter II.

---

## Connecting to the Apple II, II Plus, or IIe

Connecting the ImageWriter II to an Apple II, II Plus, or IIe requires four steps:

1. Prepare your computer.
2. Configure a **serial interface** card.
3. Install the card and connect it to the printer cable.
4. Test the connection.

The following sections take you through these steps in detail. This chapter tells you how to configure and install an Apple II Super Serial Card. If you have another serial card, see the documentation that came with your card.

---

### Preparing your computer

Before you configure and install the serial interface card, follow these steps to get your computer ready.

1. Turn off your computer, but do not unplug it.

---

#### ▲ **Warning**

Never open your computer, handle its circuitry, or install an interface card unless you have turned off the computer's power switch. This is important; you could damage your computer and interface cards by working inside the computer while the power is on. ▲

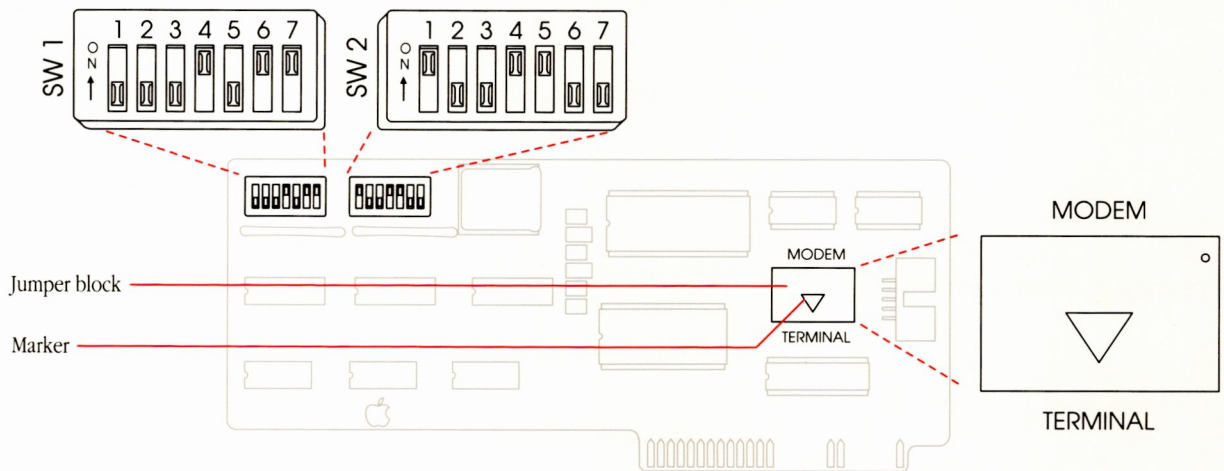
2. Grasp the back edge of the lid and lift up. Set the lid aside.
3. Discharge any static electricity you may have collected by touching the power supply (the big box in the rear left corner of the computer).
4. If the serial interface card is in your Apple II, remove it.

You are now ready to configure your serial interface card to work with the ImageWriter II.

## Configuring the Apple II Super Serial Card

Configuring the Apple II Super Serial Card takes two steps: setting the jumper block and setting the **DIP switches**. See Figure 4-7.

1. Make sure that the triangle-shaped marker on the jumper block points to the terminal setting. If it does not, gently unplug the block from the card (using a flat-bladed screwdriver or a chip puller), rotate it accordingly, and plug it back into the card.



**Figure 4-7**  
The Apple II Super Serial Card

2. Set the switches as indicated in Table 4-1 and Figure 4-7.

**Table 4-1**  
Super Serial Card switch settings

Switch 1	Function	Switch 2	Function
1 Open	9600 baud	1 Closed	8 data, 1 stop bit
2 Open	9600 baud	2 Open	No delay
3 Open	9600 baud	3 Open	Line width 80/ video off
4 Closed	9600 baud	4 Closed	
5 Open	Printer mode	5 Closed	Linefeed after <b>carriage return</b>
6 Closed	Printer mode	6 Open	Interrupts off
7 Closed	Normal CTS	7 Open	Normal CTS

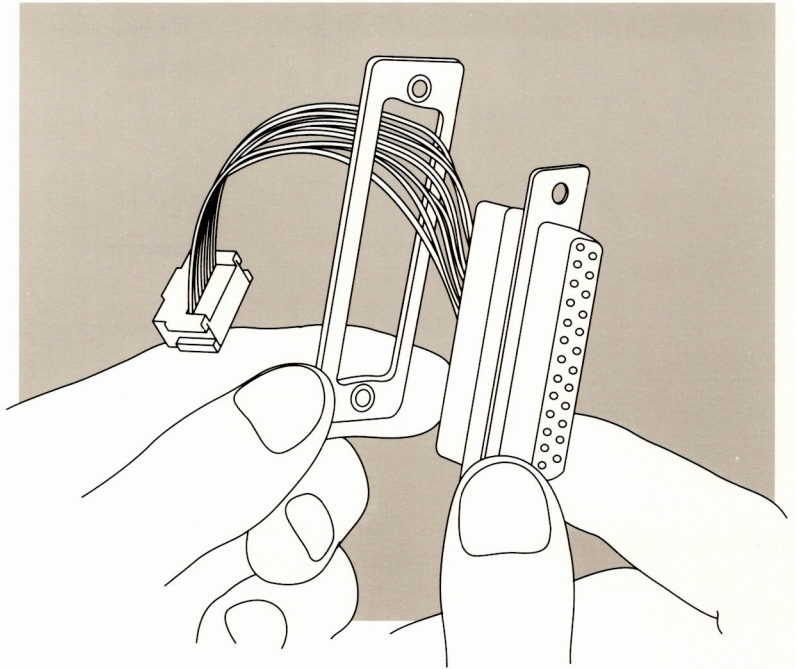
**Note:** On some Super Serial Cards, *Open* is used for *Off*; *Closed* is used for *On*.

## Installing and connecting the Apple II Super Serial Card

With your card properly configured, follow the instructions in this section to install the card and connect the printer cable.

- ❖ *Other serial interface cards:* To install a serial interface card other than the Apple II Super Serial Card, see the documentation that came with your card.

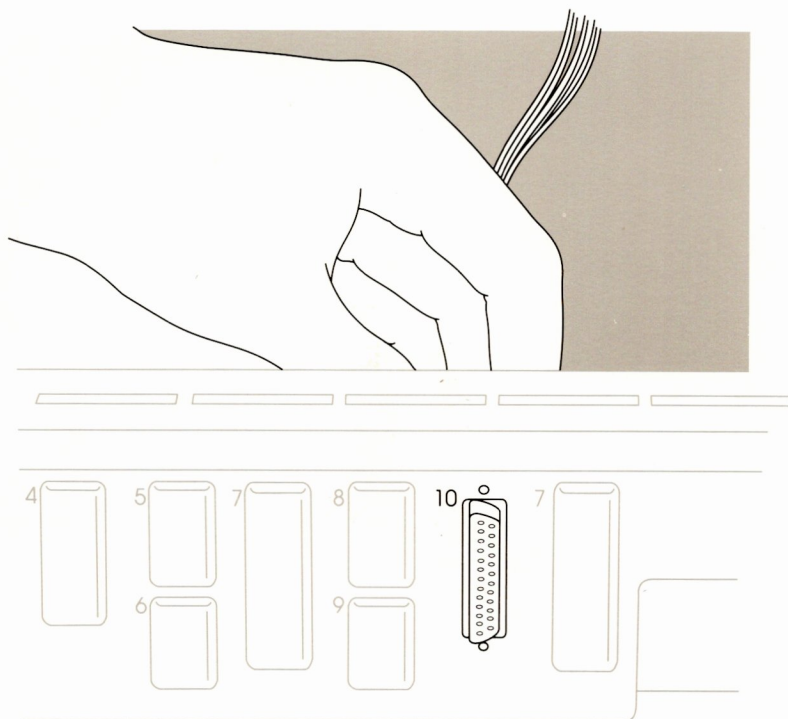
1. Slide the nut plate onto the ribbon cable as shown in Figure 4-8. Make sure the nuts on the nut plate face *away* from the 25-pin connector.



**Figure 4-8**

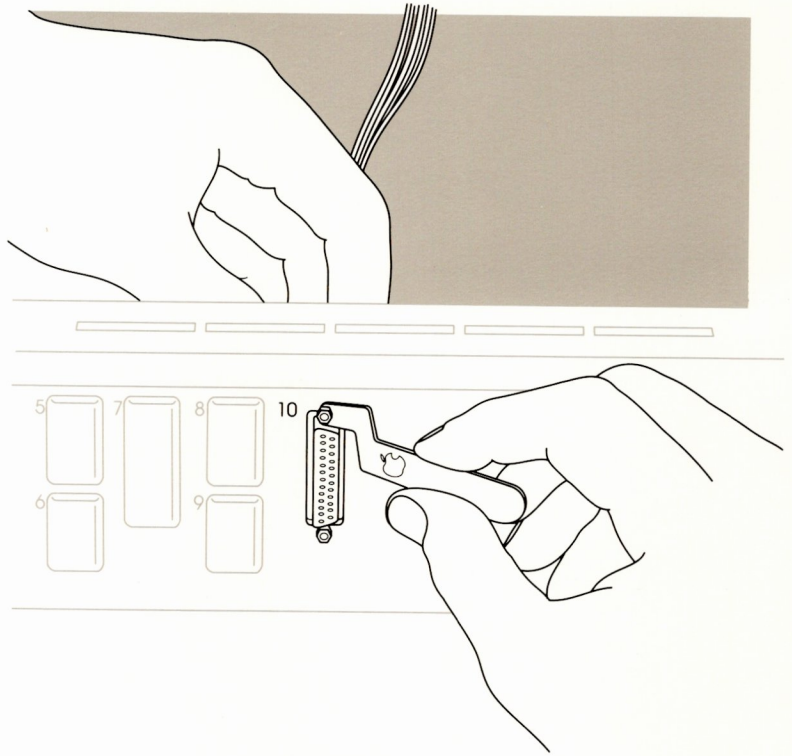
Sliding the nut plate onto the ribbon cable

2. Hold the connector and nut plate up to one of the large openings in the back panel as shown in Figure 4-9. It's best to choose one of the openings near slot 1.



**Figure 4-9**  
Positioning the connector

3. Attach the 25-pin connector to the back panel using the screws and wrench that came with the Super Serial Card. (See Figure 4-10.) Don't overtighten the screws or you could bend the connector.

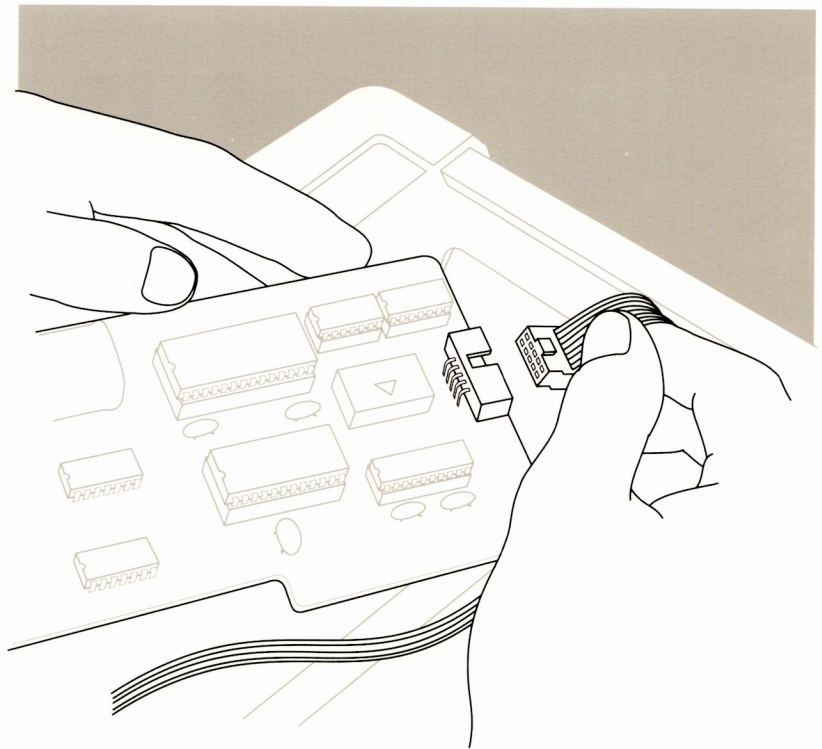


**Figure 4-10**

Attaching the connector to the back panel

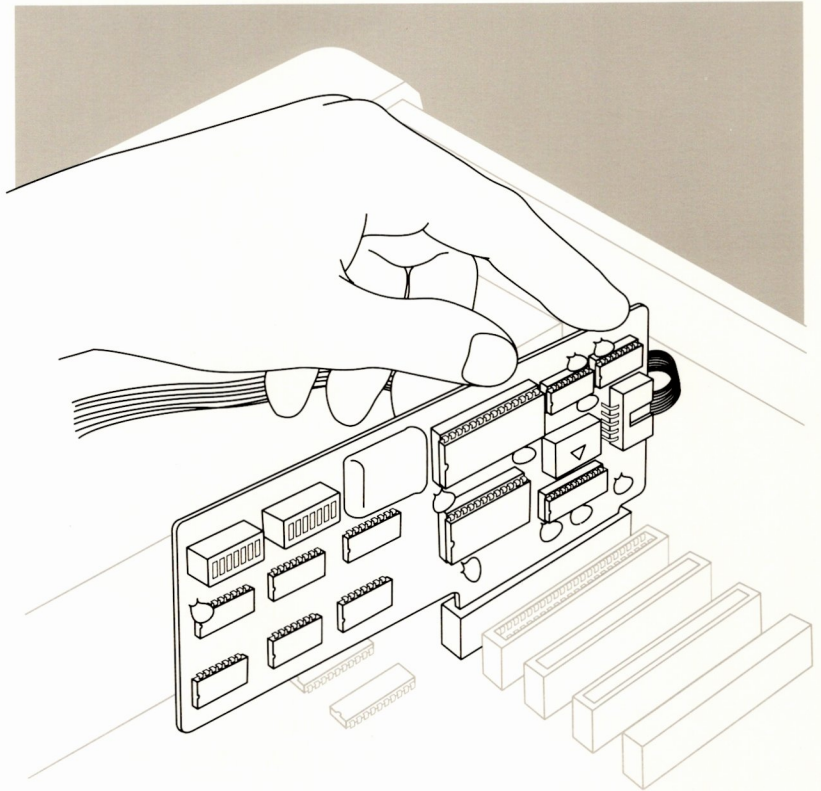
- ❖ *Apple II, Apple II Plus:* If you are connecting your Super Serial Card to an Apple II or an Apple II Plus, you'll need a special clamp to attach the cable to the back panel. Ask your dealer for service parts 805-0084 and 805-0085.

4. Connect the ribbon cable to the Super Serial Card as shown in Figure 4-11.



**Figure 4-11**  
Connecting the ribbon cable to the card

5. Put the card in slot 1. Install the card by rocking from back to front as shown in Figure 4-12. Don't rock it from side to side, and don't touch the gold "fingers" along the bottom edge of the card.



**Figure 4-12**

Installing the Super Serial Card in slot 1

6. Connect the cable from your printer to the connector attached to the back panel of your computer.
7. Replace the cover.

---

## Testing the connection

Follow these steps to test the connection:

1. Make sure that drive 1 is empty.
2. Turn on the monitor.
3. Turn on the printer and make sure that its Select light is on.
4. Turn on the computer.
5. If your computer automatically starts the disk drive, press Control-Reset to stop the disk drive and put a BASIC language prompt on the screen—a ] for **Applesoft BASIC** or a > for **Integer BASIC**.

If you have an Apple II without an Auto-Start ROM, press Reset-Control-B-Return to bring the Integer BASIC prompt to the screen.

6. To send the keyboard **output** to the printer, type PR#1. (If you put the printer card in a slot other than slot 1, type that slot number instead. For example, PR#2 if you put the card in slot 2.) Press Return.
7. Type any characters you want; This is a test will do. Press Return to send this message to the printer. Because you are sending characters to the printer, your typing will not appear on the screen.

The ImageWriter II should respond by printing the characters you typed and the words "SYNTAX ERROR." Don't worry about the error message. When you tested the printer you were actually typing in a programming language called BASIC. The error message just indicates that you didn't enter a proper BASIC command. (You weren't trying to.)

As long as the message printed, the connection passed the test. If it did not, check to make sure that both ends of the printer cable fit firmly into their ports and try the test again. If nothing happens, see Chapter 6, "General Troubleshooting."

8. To return output to the screen, press Control-Reset.



---

## Working With the ImageWriter II

**T**HIS CHAPTER DESCRIBES HOW TO

- create an efficient working environment for the ImageWriter II
- use the control panel
- work with pin-feed paper (controlling margins and removing the last page of a document)
- load multipart forms, envelopes, and address labels
- control print quality (using 2X fonts)
- print color graphics

You'll also find tips on using the ImageWriter II options.

You don't have to read through this chapter in any particular order. Simply turn to the topics that interest you.

---

## Creating an efficient working environment

Here are some points to keep in mind when setting up your working environment.

- Keep your ImageWriter II out of direct sunlight.
- Place it away from chemical fumes and containers filled with liquids—such as coffee cups, flower vases, and so on.
- Set up the ImageWriter II on a stable surface (no card tables, please). Desks, file cabinets, and printer stands work well.
- Operate the ImageWriter II in temperatures from 50° to 104° Fahrenheit (10° to 40° Celsius). You should not attempt to operate it outside this range.
- Avoid operating your ImageWriter II when the relative, noncondensing humidity goes beyond the 20% to 95% range. Don't store the printer in a place where relative, noncondensing humidity exceeds the 10% to 95% range.

If you use pin-feed paper, position the paper so that the paper flows easily into the printer. For best results, place the stack of paper behind the printer. Make sure the power cord does not lay across the paper path and cause the paper to jam as it enters the printer.

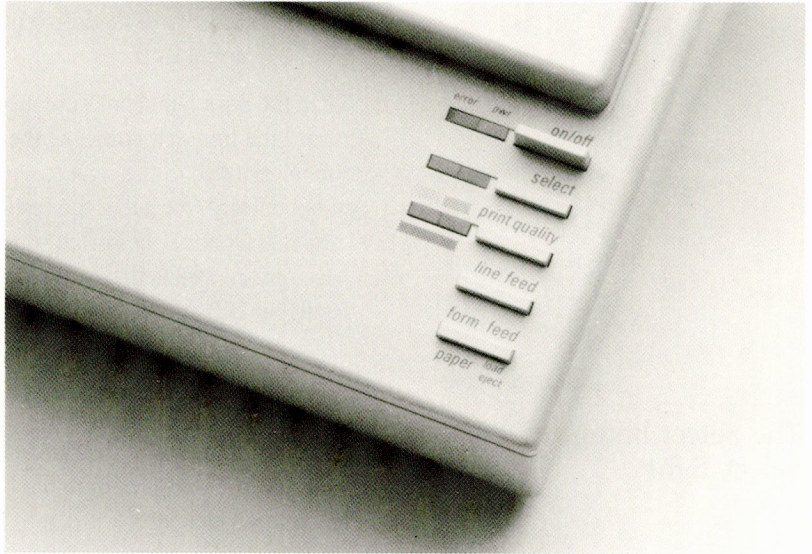
---

**▲ Warning** Keep the paper's path both into and out of the printer free of obstructions. Place the printer so that printed pages fall away from the printer. Piled-up pages can cause printer jams or unevenly printed lines. ▲

---

## Control panel details

This section shows you how to work with the various buttons and lights on the ImageWriter II **control panel**, shown in Figure 5-1.



**Figure 5-1**

The ImageWriter II control panel

---

### The On/Off switch and Power light

Turn the ImageWriter II on and off by pressing the On/Off switch. When the printer is on, the green Power light is on. When you turn the printer off, the Power light fades out.

---

## The Error light

The Error light can light in three ways: continuously on, blinking, or irregular blinking. Each state indicates a different problem area.

- When the Error light is on continuously, the ImageWriter II has run out of paper. Load the appropriate paper and press the Select button to continue printing.
- When the Error light blinks on and off, look for either of two causes. The front cover may be loose or off. Correctly seat it and press the Select button to continue. If the front cover is not the cause, check for paper or print mechanism jams.
- When the Error light blinks irregularly, check DIP switch SW2-4, located toward the front-left corner of the printer. (You may have to slide the ribbon cartridge to the right to see the DIP switches.) If you don't have an option card (for either the ImageWriter II 32K Memory Option or LocalTalk Option), the switch should be set to open. If you have either of these options installed, the switch should be closed. See Appendix B for details on DIP switch settings.

---

## The Select button and Select light

When you press the Select button, the Select light turns on or off. When the Select light is on, it means the printer is *selected*. That is, the printer can receive and print data sent from the computer. When the Select light is off, it means that you can work with the ImageWriter II control panel.

Only the On/Off switch works when the Select light is on. To do things like choose print quality or issue a form feed, you must press the Select button to turn off the Select light.

When you start the ImageWriter II with paper loaded, the Select light comes on automatically. When you run out of paper, the Error light comes on and the Select light goes out. The computer then stops sending data and the printer stops printing. After you add more paper, you can resume printing without losing any text. To resume printing, press the Select button to reselect the printer.

- ❖ *By the way:* When the Select light goes out because you've run out of paper, you can press the Select button without loading more paper. Each time you press the Select button, one line will print. You can squeeze several more lines onto a page, but be careful not to print on the bare platen.

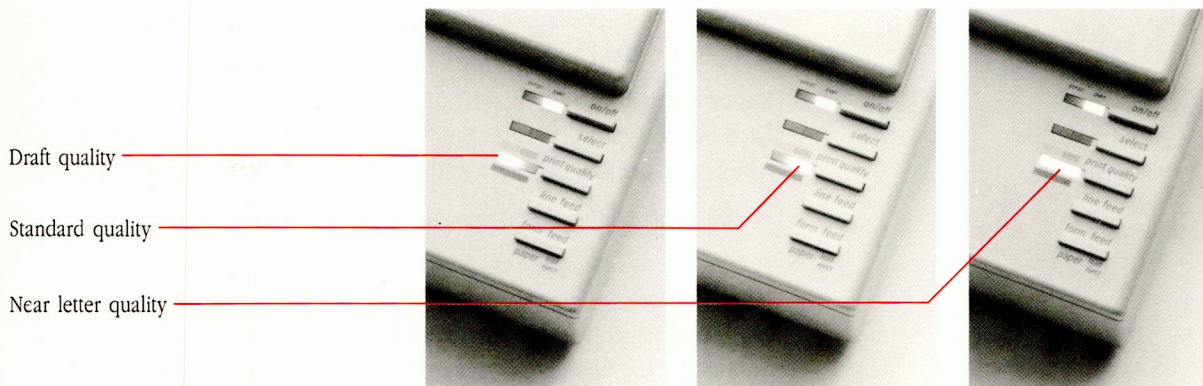
## The Print Quality button and lights

The ImageWriter II has three levels of print quality:

- **draft:** high speed (250 characters per second) for printing the least dense characters. Choose draft quality when you want a printout quickly for reviewing or editing.
- **standard:** medium speed (180 characters per second) and character density. Standard quality is good for everyday work.
- **near letter quality (NLQ):** (45 characters per second) high density characters for presentations and formal communications.

Make sure the Select light is *off* before choosing a print quality. (If the light is on, press the Select button.)

By pressing the Print Quality button repeatedly, you can “walk” through the three settings. Figure 5-2 shows the selection in terms of the lights.



**Figure 5-2**  
Print Quality selection lights

When only the left light is on, you get draft quality. When the right light is on, quality is standard. Both lights on means near letter quality.

- ❖ *Important for Macintosh owners:* Choosing either Faster or Best quality in the Print command dialog box **overrides** any quality setting on the printer. However, if you choose Draft quality in the dialog box, the quality will be that currently selected at the printer—either draft, standard, or NLQ.

---

## The Line Feed button

To use the Line Feed button, the Select light must be off. If you press and release the Line Feed button the paper advances one line. If you press and hold down the Line Feed button, the printer will perform repeated **line feeds** up to four times. After the fourth line feed, the printer automatically performs a form feed.

---

## The Form Feed button

The Form Feed button has three related functions:

- **Form Feed.** When using pin-feed paper, pressing the Form Feed button advances the paper one full page-length.
- **Paper Load.** When loading a single sheet of paper, pressing the Form Feed button causes the printer to load the sheet with the print head  $\frac{1}{8}$  inch below the top edge of the paper. Printing begins from this position (unless you have set margins in your software, in which case the margins are measured from this position).

Macintosh users printing on single sheets of paper should be sure to select Hand Feed in the Print dialog box.

- **Paper Eject.** When a print job finishes in mid-page, pressing the Form Feed button ejects or pushes out the current page. If you're using pin-feed paper, the printer advances the paper to the top of the next page.

When the Select light is on, pressing the Form Feed button has no effect.

- ❖ *Printing an occasional single sheet:* If you're using pin-feed paper, and find you have to use a single sheet of paper (if you want your cover page on colored paper, for example), don't despair. Back the pin-feed paper out from under the platen (unless you're using labels or multipart forms), but leave it clamped in the forms tractor. Then switch the paper feed selector to friction feed and load your single sheet. Don't forget to reset the paper feed selector after you've printed the single page.

---

## Working with pin-feed paper

This section provides tips for using pin-feed paper. Specifically it talks about

- how to adjust where the printer prints the first line on a page
- how to control margins

---

### Controlling where the top line prints

When you turn on the printer, the ImageWriter II assumes that the paper is positioned with the top edge just under the paper bail. As long as you leave the printer turned on, the printer remembers this position as the top of a page.

This means that when you press the Form Feed button, or when an application issues a form feed when it reaches the bottom of a page during a print job, the ImageWriter II knows how far it must advance the paper to begin printing on the top of the next page.

If you advance or load paper independently of the software, you can cause the ImageWriter II to misjudge the position of the page breaks. For example, if you interrupt a print job and then advance the paper (either manually or by pressing the Line Feed button), the software won't register that you've set a new paper position. The result is that the next page break will occur somewhere in the middle of the page instead of at the end of a page.

You can easily tell the printer where the perforations between pages are by following these steps.

1. Press the On/Off switch to turn off the printer.
2. Turn the platen knob to advance the paper to the top of first page.
3. Press the On/Off switch again to restart the printer.

The printer registers this position as the top of a page and advances form feeds and software page breaks to the top of the next page.

---

## Controlling margins

The way you set margins varies depending on what application you're using. Usually you're able to set top, bottom, left, and right margins from within the application you're using.

### Top and bottom margins

When setting a top margin, remember that the top margin you specify will be measured from wherever the printer has registered the top of the page. In general, if you turn on the printer with 1 inch of paper extending above the print line, and then set a 1 inch top margin in your application, the result will be 2 inches of blank space above the first printed line.

If you're printing from a Macintosh, however, pin-feed paper will usually roll back about  $\frac{3}{8}$  inch before printing begins, making your top margin  $\frac{3}{8}$  inch less. You can use your application software to compensate for this roll back. Some applications allow you to add carriage returns or headers to the tops of pages. Others let you specify a top margin in the Page Setup dialog box (usually found in the File menu).

In addition, some applications for the Macintosh automatically add a margin which will be added on to the  $\frac{3}{8}$ -inch margin acquired when the paper is under the paper bail.

❖ *Note:* Because applications differ in how they determine where printing begins on a page, the best way to set your margins is to try printing a test page with an application before you print your document. For example, if you're using a word processing program, type a line of text across the top of the page, print the page, and notice where the line prints. Then adjust your software to achieve the margins you want. You can do the same kind of trial run by drawing a horizontal line across the top of the page in a graphics program.

When you set a bottom margin, remember to take into account that 1 inch more paper above the print head means 1 inch less paper below the last line of text. For example, if you want a 2-inch bottom margin, and you turn on the printer with 1 inch of paper above the print line, you need to set your software for a 3-inch bottom margin to compensate for the extra inch on the top of the page.

## Left and right margins

When working with pin-feed forms and labels, you may need to adjust the left margin to start printing at the left edge of the paper. Usually the application software you're using allows you to adjust these margins (see the application's documentation). If it does not, simply try printing a sample form or label to determine where your software begins printing. Then slide the left tractor over so that the form is in the proper position for left-margin printing. Set the right tractor to take up the slack in the form or labels.

---

## Removing the last pin-feed page

If you're working with pin-feed paper, you might notice that when a print job ends, some of the last page remains inside the printer. Choose any of three ways to make it easier to tear off the last page.

- You can solve the problem by turning the printer off, turning the platen knob so that the perforation is just above the paper bail, and then turn the printer back on. The printer will stop at this position after each print job making it easy to tear off the last page. (Remember to adjust your top and bottom margins in your application to correct for the extra paper above the print line.)
- With the Select light off, eject the page with a form feed.
- Leave the last page of the document in the printer until you print another document. Then tear off the page.

### △ Important

Do not back out labels or multipart forms. They could separate and jam the printer. △

---

## Loading forms, labels, and envelopes

To print on multipart forms and envelopes, you need to adjust the printer for thicker paper.

---

### Adjusting for paper thickness

To adjust for thicker paper, forms, or labels, you need to set the **paper thickness lever**. The lever clicks through four positions. In its standard (up) position, the lever sets a thickness for one sheet of paper (16- to 24-pound bond). You can change to the second position by pushing the lever down. The second position is for a two-sheet thickness. The next position is for three sheets and the last for four.

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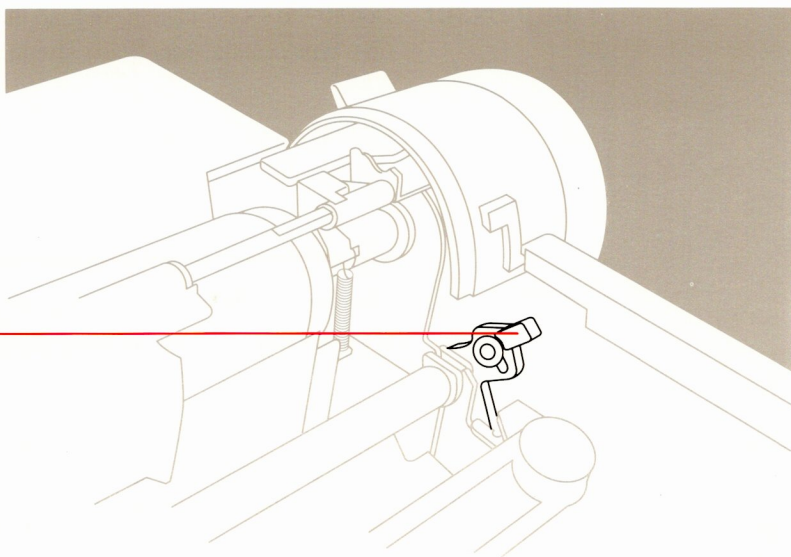
#### ▲ Warning

Never use a form, label, or envelope that is thicker than four sheets of 16-pound bond. Too much paper may cause lines to register incorrectly or may jam the printer. ▲

Follow these steps to set the lever.

1. To get at the lever, remove the front cover. The lever is at the right end of the **carrier rod**.
2. Before setting the lever, count the sheets in an individual form. For envelopes, try a two-sheet thickness, and for mailing labels, a three-sheet thickness.
3. Click the lever to the appropriate setting.
4. After adjusting the paper thickness lever, replace the front cover. If the cover is off or not properly seated, the ImageWriter II will not print.

Paper thickness lever



**Figure 5-3**  
The paper thickness lever

## Finding the correct tractor position

When working with pin-feed forms or labels, you may have to adjust the tractors. See Chapter 2 for an explanation of how to adjust the tractors.

Before you adjust the tractors, a little experimentation is in order; follow these steps.

1. Load a few pages of ordinary pin-feed paper and print your form or a few labels on this paper so that you can see where the program sets the left margin. Use the pin-feed icon (on the back of the printer, to the left) to help you align the form or label sheet.
  2. Remove the test paper and load your form or labels. Set the left tractor so that the point where you want to begin printing on your form or label corresponds with the left margin actually delivered by the program.
- ❖ *By the way:* If the Error light comes on, signifying that the printer is out of paper, you may have set the left tractor too far to the right. Readjust the tractor and try again.

△ **Important** Don't try to set the margins beyond the red rings on the paper bail. These rings represent the print head's absolute boundaries. △

3. With the left tractor set, set the right tractor to take the slack out of the forms or label sheet.

---

▲ **Warning** When using labels, do not turn the platen knob counterclockwise. This could cause a label to come off in the printer, possibly causing damage. ▲

4. When you have finished your form or label printing, you may want to make a note on your sample printout page of the settings you used, for future reference. Be sure to reset paper thickness before reloading regular paper.

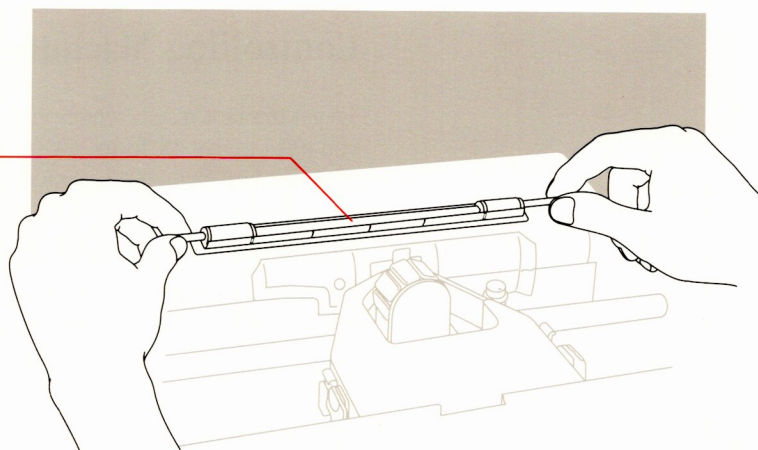
---

## Loading envelopes

Follow these steps to load and print envelopes.

1. Remove the front cover and set the paper thickness lever to the appropriate thickness (usually two sheets).
2. Replace the front cover.
3. Set the paper-feed selector to friction feed.
4. Remove or tip back the front cover window.
5. Lift up the paper bail until it locks into place. (See Figure 5-4.) This elevated position ensures that your envelopes won't jam in the bail during the printing process. Leave the bail in this position until you've finished printing your envelopes.

Paper bail



**Figure 5-4**  
Setting the paper bail for envelopes

6. Align the envelope with the single-sheet icon on the back cover.
7. Turn the platen knob to draw the envelope into the desired position for printing.
8. Issue your software's print command.
9. If necessary, turn the platen knob to eject the envelope from the printer when printing stops.
10. When you are finished with envelopes, press gently on both sides of the paper bail to return it to its normal position.
11. Be sure to reset the paper thickness lever and, if necessary, the paper feed selector before returning to normal printing.

---

## Controlling Macintosh text quality

To get the best results when printing text in Best mode using a Macintosh, you need to use **2X fonts**. 2X (two times) fonts are simply **fonts** that are twice the size as the fonts shown on your screen. For example, if you want to get the best results printing a page of text using the Geneva 12-point font, you need to have a Geneva 24-point installed in your System file.

Figure 5-5 shows 12-point Geneva printed in Best mode with and without the 2X font installed. Note the difference in quality.

12-point Geneva with 24-point Geneva installed.

12-point Geneva without 24-point Geneva installed.

**Figure 5-5**

Print quality comparison

---

### How 2X fonts work

Images on a Macintosh screen and on an ImageWriter printout are created by small dots grouped in the shape of the image on the display or printout. The more tightly the dots are grouped, the better the resolution (clarity) of the image. Resolution is usually expressed in dots per inch (dpi).

The Macintosh display creates images using 72 dpi, and in its highest quality mode, the ImageWriter II prints using twice that resolution, 144 dpi. That's why when the Macintosh prepares to print Best quality text on an ImageWriter II, it looks for a font that is twice the size of the font on the Macintosh display.

Displayed fonts contain only enough information to create an image at 72 dpi. But a font that is twice the size of the displayed font contains twice the amount of information on the shape of the image. The Macintosh can use the extra information contained in the larger font to fill in the dots necessary to create the smaller image at twice the resolution (144 dpi, the resolution the ImageWriter II uses).

Geneva and New York 9-point fonts come on most Macintosh System files with their 2X equivalents (18-point) already installed. To find out what 2X fonts are available on your system, you can use the Font/DA Mover (see your *System Software User's Guide* or the owner's guide that came with your Macintosh). Simply look at the available fonts in your System file and note which font families have one font size that doubles a font size in the same family (Times 9-point and Times 18-point, for example). Then, when you want the best quality output, format your text using one of these fonts in the smaller size, and select Best mode in the Print dialog box. You can print text without the 2X font, but the output will not be as clear.

To find more 2X fonts to add to your system, you can use the Font/DA Mover to search through the System files that came with any applications you might have. Your authorized Apple dealer may also sell font packages that contain a variety of fonts in many sizes. Use the Font/DA Mover to add these fonts to the System files you use on your startup disks.

---

## Printing in color

To print in color, you need a program that can send color commands to an ImageWriter II. How the application uses the color capability of the ImageWriter II is different from application to application. For this reason, this guide can only give you basic information on color printing. To find out how to use the ImageWriter II's color capabilities, check your application's documentation.

The **default** color for the ImageWriter II is black, and only color software can make it print differently. See Appendix B for information on programming in color.

To print in color, install a color ribbon cartridge, just as you do a black ribbon. With the color ribbon installed, the ImageWriter II can print up to six colors plus black. With black as one of the ribbon's colors, you can mix your color graphics with black text. However, if you intend to print a document using only black text, it's a good idea to switch to a black ribbon. This preserves the black band on the color ribbon.

- ❖ *Don't overdo it:* The color feature on the ImageWriter II is meant mainly as a highlighting tool. If you print large amounts of color text and graphics, your ribbon will wear out quickly.

---

## ImageWriter II options

This section gives descriptions of three ImageWriter II options, and a few tips on using them. The options include the

- ImageWriter II SheetFeeder
- ImageWriter II 32K Memory Option
- ImageWriter II/LQ LocalTalk Option

For complete details on an option's operation, see the option's manual.

---

### The ImageWriter II SheetFeeder

If you plan to use your ImageWriter II to do large print jobs on cut-sheet paper, consider adding an ImageWriter II SheetFeeder to your printer. The SheetFeeder automatically loads up to 100 sheets of paper, sparing you the tedium of hand-loading paper for large print jobs.

Here are a few tips on using the SheetFeeder:

- Before working with the ImageWriter II SheetFeeder, make sure that the paper feed selector is in the friction-feed (down) position.
- Before loading a stack of paper, flip through the stack to loosen any pages that might be stuck together.
- Never load more than 100 sheets of paper at a time.

See the *ImageWriter II SheetFeeder Installation Manual* for more information.

- ❖ *Note:* You cannot use pin-feed paper when the ImageWriter II SheetFeeder is in place.

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### The ImageWriter II 32K Memory Option

If you're working with an Apple II computer, you should consider adding the 32K Memory Option. When you issue a print command with the memory option installed, the memory option quickly takes the data to be printed from your computer and feeds the data to the printer, freeing your computer to go on to other tasks. The memory option has a 32,000-character memory, enough to handle 16- to 20-page documents.

- ❖ *Note for Macintosh users:* In most cases, the memory option has no effect when working with a Macintosh, because of the way Macintosh sends text to the printer.

The ImageWriter II continues to print until it has processed all the characters in the option's memory. To pause while printing, press the Select button. Press it again to resume printing. If you need to cancel printing, turn off the printer, pause a few seconds, and turn it on again.

If the memory option doesn't seem to work, check DIP switch SW2-4. It should be in the closed position. See Appendix B for details on DIP switches.

---

## The ImageWriter II/LQ LocalTalk Option

If your workplace has several computers, you probably already have them linked with an AppleTalk network system. LocalTalk (a cable system used to connect computers and devices in an AppleTalk network system) allows you to link computers with each other for electronic mail, with file servers for file sharing and bulletin board applications, with print spoolers that enhance the speed of your print jobs, and with printers so that several computers can share the same printer.

In fact, the ImageWriter II/LQ LocalTalk Option lets you connect your ImageWriter II to up to 31 computers. You can connect Macintosh 512K or newer computers, or any Apple II computer with AppleTalk capability.

To enable the option, set DIP switch SW2-4 to closed. To disable the LocalTalk Option, first unplug the LocalTalk cable from the printer. Then set SW2-4 to open.

**▲ Warning** When disabling the LocalTalk Option, you must unplug from the LocalTalk network before resetting the DIP switch. Failure to unplug can stop the whole network from functioning. ▲

You must configure your software to work with the LocalTalk cable system with the ImageWriter II. See the *ImageWriter II/LQ LocalTalk Option User's Guide* to read about configuring your software, and about these topics:

- installing the LocalTalk card in your printer
- connecting your ImageWriter II to the LocalTalk cable system
- printing over the network
- testing and troubleshooting the LocalTalk installation
- disconnecting and reconnecting the network

---

▲ **Warning** Do not connect an ImageWriter II to a LocalTalk cable system without a LocalTalk card installed or without the card enabled. If you do, you will disable your entire network. ▲

See Appendix B in this manual for more information on DIP switch settings, and the documentation that comes with your network for more information about the AppleTalk network system.

---

## General Troubleshooting

**T**HIS CHAPTER LISTS COMMON PROBLEMS AND SUGGESTS SOLUTIONS. OFTEN, THE problems you encounter are easy to understand—such as a loose printer cable or having the Select button in the wrong position.

If there seems to be a more complex problem, run the printer's self-test. See the section "The ImageWriter II Self-Test" at the end of this chapter. If there are problems with the self-test, you've isolated the problem to the printer. Check that the ribbon cartridge is correctly seated, that there is no slack in the ribbon, and that the printing area of the ribbon is between the ribbon guide and the paper guide. Try the self-test again. If there is still a problem, contact your authorized Apple dealer.

If the self-test is successful, you'll know that the problem is not with the printer. The problem could be

- a poor connection or flaw in the printer cable and its connectors
- improperly configured software
- improperly set DIP switches in the printer
- a hardware failure, an improperly set jumper block, or DIP switches in the interface card (if the serial interface cable connects to one)
- a hardware failure in the computer

**△ Important** Proper environment and maintenance can prevent many problems. See Chapter 7 for details on care and maintenance. △

The following sections describe problems you might encounter, and help you diagnose and solve the problems. If none of the suggestions here help solve your problem, see your authorized Apple dealer.

---

## You can't turn on the printer

If pressing the printer's power switch doesn't light the printer's power light, check these potential problem sources:

- Is the power cord plugged in? Make sure that the power cord is firmly seated in the ImageWriter II power socket and your power outlet.
- If you're using a power strip, is it plugged in? Is it turned on?
- Is power available to the power outlet? You may want to try plugging something else into it, like a radio or lamp. If the appliance doesn't work, the problem probably lies somewhere in your electrical system. Is the outlet controlled by a wall switch? Is the problem a blown fuse or tripped circuit breaker? You might try plugging the ImageWriter II into another outlet that you know is working.
- If you determine that the printer is properly plugged in and turned on and that power is available to its outlet (the test appliance works), the problem may be a blown fuse in the printer. Take the printer to your authorized Apple dealer for fuse replacement. (The fuse is internal and should be replaced only by an authorized Apple dealer.)

---

## The printer is on, but nothing happens

Several things can cause this problem.

- Is the ImageWriter II Select light on? You must *select* the printer by pressing the Select button so that the Select light comes on, or it cannot receive data from the computer.
- Is the ribbon properly installed? Is it jammed? Remove the printer's front cover and check that the ribbon cartridge is correctly seated and that the print area is between the ribbon guide and the paper guide.
- Are you using the correct printer cable? See Chapter 3 for Macintosh computers, Chapter 4 for Apple II computers.
- Is your serial interface card jumper block set to terminal? See Chapter 4.
- Are the baud settings between the printer and the software or between the printer and interface card correctly matched? (See the section "Mismatched Baud," later in this chapter.)
- If you're using the LocalTalk Option, is the printer correctly connected to the network? See the *ImageWriter II/LQ LocalTalk Option User's Guide*.
- Is the printer cable plugged into the correct port? The cable will fit into both the printer port and the modem port on the Apple IIGS and Macintosh computers. Either port will work, but you must use the Macintosh Chooser desk accessory or the Apple IIGS Control Panel program to tell your computer which port you've used for the ImageWriter II. See Chapter 3 for Macintosh computers, Chapter 4 for the Apple IIGS.
- ❖ *Note:* Some applications for the Apple IIGS ask you to complete additional steps to choose a printer for each print job. For information on how to print with a particular application, see the documentation for that application.

---

### ▲ **Warning**

Never adjust or change a cable or an interface card when the computer is on. ▲

---

## Error light problems

The red Error light's three states indicate three problem areas:

- The Error light is on.

You are out of paper. Load a fresh supply of paper and press the Select button to print.

- The Error light is blinking.

There are two causes for the blinking Error light. The front cover may be loose or not on. Correctly seat the front cover and press the Select button to continue. If the front cover is not the cause, check to see if anything has jammed the print mechanism.

- The Error light is blinking irregularly.

When the Error light blinks irregularly, take a look at DIP switch SW2-4, located toward the front-left corner of the printer. (You might have to slide the ribbon deck to the right to see the DIP switches.) If you don't have an option card (the ImageWriter II 32K Memory Option or LocalTalk Option), the switch should be set to open. If you have either of these options installed, the switch should be closed. See Appendix B for details on DIP switch settings.

---

## You get a printout, but it's nothing like you expected

Problems including odd spacing, garbled characters, missing characters, or unexpected characters inserted in your printout are usually a result of mismatched settings between the printer and the software or between the printer and the interface card. These mismatches can stem from

- incorrect configuring of an application program's settings
- incorrect DIP switch settings on the interface card
- incorrect DIP switch settings on the ImageWriter II

## △ Important

Do not turn off the printer while it is printing a document. Interrupting a print job in this way can cause the printer to print garbled text when you turn it back on.

When you start up your computer system, turn on your computer before you turn on your printer. The computer may send out random characters during startup that might print if the printer is already turned on. △

When diagnosing a problem, check for software problems first. Chances are the problem doesn't lie with the printer's switches, unless someone has reset them. The switches are factory-set to standard specifications. See Appendix B for details on DIP switch settings and how to change them.

Software problems happen when a program's settings are not the same as the printer's. The process of changing software settings is called **configuring**.

If you suspect a configuration problem, read the material on configuration in your application program manual and check it against the standard settings for the ImageWriter II in Appendixes B and D. If you find a discrepancy, reconfigure the program to match the printer's specifications.

You might also try printing something from a different program—one you know works. If it works and the problem program doesn't, you probably need to reconfigure the problem software.

Mismatched DIP switch settings can cause the same problems as misconfigured software. The switch settings tell the printer or interface card how to communicate with the computer. If the settings on the printer or interface card don't match the settings your computer and software expect, the communication gets garbled, and garbled printouts result.

The ImageWriter II has two DIP switch blocks. Serial interface cards have their own DIP switch blocks. If you're using a Macintosh or an Apple IIc, or an Apple IIGS through a serial port, you need only concern yourself with the ImageWriter II's DIP switches.

The following sections discuss some common printout problems, and tell you how to diagnose and solve them.

---

## Missing, jumbled, or random characters

These problems are caused by mismatched baud or mismatched **data byte** information (including **data byte length**, **parity**, **stop bit**, and **start bit** settings).

### Mismatched baud

The baud is the speed at which the computer or interface card sends data to the printer. When these speeds are mismatched, the printer can produce a garbled printout. The ImageWriter II is set to 9600 baud at the factory.

Switches SW2-1 and SW2-2 should both be closed. If you own a Macintosh, an Apple IIc, or if you connected the printer to an Apple IIGS through a serial port, check these switches.

If you have an Apple II, II Plus, or IIe, and you're *not* using an Apple Serial Communications Card, make sure your serial card is set to 9600 baud. If you *are* using an Apple Serial Communications Card or other card set to 300 baud, you must reset the ImageWriter II to 300 baud. Switches SW2-1 and SW2-2 should both be open for 300 baud.

The manual that came with your interface card will tell you what baud the card uses.

---

### ▲ Warning

Never adjust switches or work with an interface card when the computer is on. You could harm the computer and the interface card. ▲

### Data byte mismatches

Data byte mismatches are another common cause of printout problems. These problems can occur through improper software and serial interface card settings. Data byte mismatches include mismatches for

- data byte length
- start bit
- stop bit
- parity setting

The ImageWriter II is *permanently* set for an 8-bit data byte with one start bit, one stop bit, and no parity. Check to make sure that your software settings match these settings. If you have an interface card, check its settings as well.

---

## Intermittently dropped or random characters

Mismatched **communications protocols** or a hardware failure (like a flawed connector or cable) can cause intermittent problems.

Communications protocols tell a computer when to send data and when to pause in sending. A protocol mismatch can cause intermittent loss of characters or intermittent random characters. The ImageWriter II is factory set for the **hardware handshake** (also known as **Data Terminal Ready** or DTR) protocol. DIP switch SW2-3 should be set to open. Closing this switch results in the **XON/XOFF** protocol.

Check the protocol settings for your software and for your interface card (if you have one). If your software or card can be configured for DTR protocol, configure it for that protocol. If it cannot, but it supports XON/XOFF, set the ImageWriter II's DIP switch SW2-3 to the closed position to match the setting for the card or software.

---

## Spacing problems

If the printout shows the entire document printing on one line or it's double- or triple-spaced when you wanted single spacing, the problem is line feed. A line-feed character causes the printer to advance the paper one line every time your software sends a carriage return (meaning the end of a line).

If the whole document printed on one line, it means that no line-feed character was sent to advance the paper. The printer, the software, and the interface card can all issue line feeds. If you want single-spaced documents as your standard, you must set *one and only one* of the three to add a line feed after a carriage return.

The ImageWriter II is factory set so that it does not add a line feed after a carriage return. (That is, switch SW1-8 is factory set to open.) If your system uses an interface card, set the interface card to add the line feeds. If your system does not have an interface card (Macintosh, Apple IIGS, and Apple IIc), or if you don't want to reset the card, set your software to send the line feed. Some software can't send line feeds, in which case you'll have to reset switch SW1-8 to the closed position to send a line feed after a carriage return.

If you have unwanted double spacing, the printer is receiving two line feeds for each carriage return. Reset either the software, the card, or the printer to not send a line feed. If you have triple spacing, suppress line feeds at two points (preferably at the printer and the software).

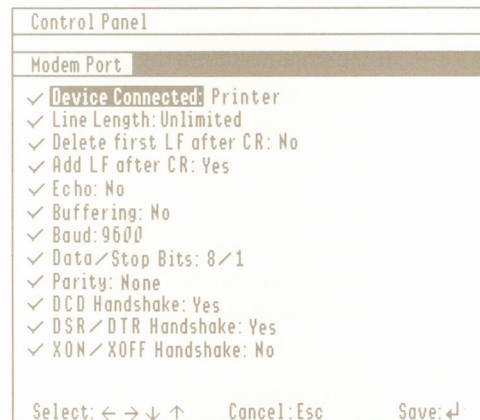
## Apple IIGS problems

The Command key is the key with the Apple symbol and the propeller symbol.

If you're using an Apple IIGS with your ImageWriter II and you can't get the printer to print, or if the printouts you get are not what you expected, you may need to adjust the Apple IIGS Control Panel settings.

1. Turn on your computer and press Control-Command-Esc.
2. Press Down Arrow until the Modem Port or the Printer Port option is highlighted (whichever you connected the printer to). Press Return.
3. Match the settings to those in Figure 6-1.

❖ *Note:* Some applications for the Apple IIGS ask you to complete additional steps to choose a printer for each print job. For information on how to print with a particular application, see the documentation for that application.



**Figure 6-1**  
Apple IIGS Control Panel settings

---

## Paper and print quality problems

If characters don't print clearly or start to look lighter with each line, check the following:

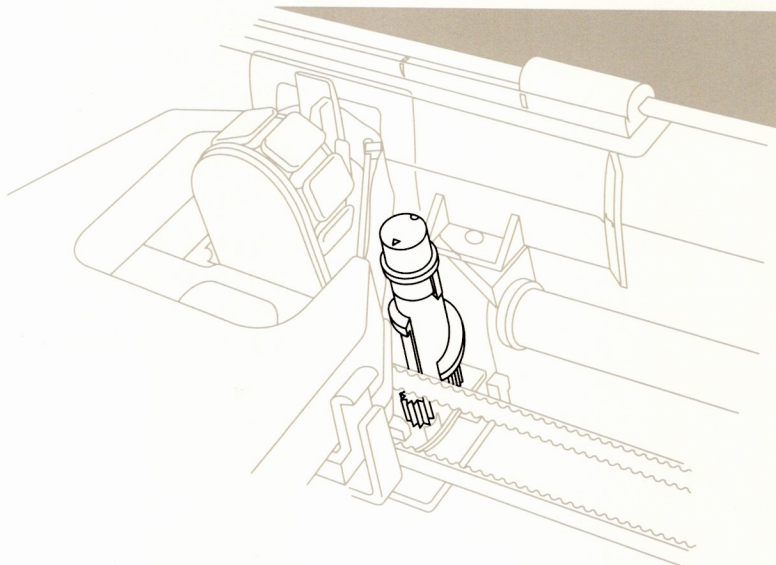
- Is your ribbon cartridge correctly mounted? (See Chapter 2.)
- Have you correctly threaded the ribbon between the ribbon guide and paper guide?
- Is the paper thickness lever set to the appropriate position? An incorrect setting can cause a poor impression (including missing dots).
- Is the ribbon worn out?
- Did printing take place across the ribbon seam? When the printer types across the ribbon seam, characters print lighter for a line or so.
- If the paper is feeding incorrectly, make sure that you've set the paper feed selector to the correct setting—friction feed (the down position) for cut-sheet paper, pin feed (the up position) for pin-feed paper. Also, make sure that you are not inserting pages at an angle.
- If you are using the SheetFeeder with the ImageWriter II and have paper problems, see the *ImageWriter II SheetFeeder Installation Manual*.
- If the ImageWriter II's ribbon and paper feed selectors appear to be set and working correctly, but you're not getting good quality printouts, check that the print quality on the ImageWriter II is set to the near letter quality setting (see Chapter 5). If you're a Macintosh user you should also check your application software's Print dialog box to make sure that you've selected Best mode.
- If you want to get the best quality text printing from a Macintosh, make sure that you format your text using a font for which there is a 2X font available. For example, use Geneva 12-point if you have a Geneva 24-point installed in your System File. (See Chapter 5 for more on 2X fonts.)

---

## Color ribbon problems

Occasionally, an unwanted color may show up on a printout. Typically, an underscore character or the very bottom or top of a character prints in a different color from the text directly above it. Three things can cause this problem:

- The ribbon cartridge is not firmly in position on the ribbon cartridge deck. Press down on the cartridge to make sure it's secure. If you hear the ribbon snap into place, you have solved the problem.
- The color ribbon is old. Older ribbons tend to bleed colors across boundaries. Replace the ribbon with a new one.
- The ribbon cartridge is not properly aligned to the print head. To solve this problem follow these steps:
  1. Remove the cover from the ImageWriter II and locate the ribbon adjustment assembly to the right of the ribbon cartridge. See Figure 6-2. Notice the two position markers. Their position is factory set for optimum performance on most ribbons. You can turn the red ring to move the ribbon up or down across the print head.



**Figure 6-2**  
Ribbon adjustment assembly

2. Push the red ring down to free it. If the color overlap is at the bottom of characters you print, turn the ring clockwise. If the overlap is at the top of characters, turn the ring counterclockwise. How far you turn the ring depends on how much color overlap you see. Turning the ring 180 degrees moves the ribbon .014 inch. Never turn the ring more than 180 degrees (half a turn) in one direction; you could break the mechanism.
3. Release the ring when you have turned it to the desired position. The ring will pop up and lock into place.
4. Replace the ImageWriter II's cover.
5. Run the ImageWriter II self-test and study the areas you were having trouble with. Readjust the ribbon alignment if necessary.

---

## The ImageWriter II self-test

The self-test tests the printer only, not its communications, cables, connectors, or the computer. Here's how to run the test.

---

**▲ Warning** Be sure the printer has paper before running the self-test. Printing without paper can damage the print head, the platen, or both. ▲

1. Turn off the printer and wait for a few seconds.
2. Press the Form Feed button and hold it down while pressing the On/Off switch. Release both buttons at the same time. Let the ImageWriter II print a half a page or so.
3. Turn off the printer to stop the test.
4. Study the printout. All characters should print clearly. If the problem you saw when printing from the computer appears in the test, the problem probably lies with the printer. Contact your authorized Apple dealer for assistance.



---

## ImageWriter II Care and Maintenance

A GOOD ENVIRONMENT PLUS OCCASIONAL CLEANING WILL KEEP YOUR ImageWriter II printer in top working condition for years to come.

In addition to describing the appropriate operating environment for the ImageWriter II, this chapter tells you how to clean your printer, and who to turn to if it needs servicing.

---

## Operating environment

Apple designed the ImageWriter II to work well in any clean, indoor location. The ImageWriter II operates reliably in temperatures from 50° to 104° Fahrenheit (10° to 40° Celsius). You should not attempt to operate it outside of this range. The safe noncondensing humidity range is from 20% to 95%. You can safely *store* the ImageWriter II in more extreme temperatures—from -40° to 116° Fahrenheit (-40° to 47° Celsius). The safe storage range for noncondensing humidity is 10% to 95%.

---

**▲ Warning** Avoid using the ImageWriter II in a dusty environment or exposing the printer to chemical or solvent fumes (including steam from a coffee maker). Do not set containers filled with liquids—such as cups of coffee—on or near the printer. Do not leave the printer in direct sunlight for long periods of time. ▲

---

## Cleaning the case

Wipe the case with a soft, damp (not wet) cloth. To remove stains or dirt, add a drop of liquid detergent to a damp cloth before wiping.

**△ Important** Don't clean the case with household cleansers, ammonia, powders, abrasives, or solvents (such as cleaning fluid). Any of these can mar the finish of the ImageWriter II. △

---

## **Cleaning the inside of your ImageWriter II**

It's a good idea to clean the inside of your ImageWriter II once a month, mainly to remove paper dust and bits of paper. The ImageWriter II does not need lubrication thanks to special materials in the print mechanism.

To clean the inside of your ImageWriter II, you should have either a soft, clean brush or small can of compressed air. You could also use a clean, lint-free cloth. Here's how to do it:

1. Turn off the printer and remove the front cover.
2. Remove the ribbon cartridge by gently bending aside either of the support tabs and popping out the cartridge.
3. Brush or blow away any dust that may have accumulated.
4. If the carrier rod is dirty, wipe it with a clean, soft, lint-free cloth. Clean up any other dirt you might find.
5. Replace the ribbon cartridge and front cover.

You're ready to print again.

---

## **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, CA 95014  
USA

Apple also offers service options designed to meet your needs. One of these is the *AppleCare*® Service Agreement (available in the United States, Canada, and Australia only), which extends full warranty coverage up to three years. Your *AppleCare* 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.

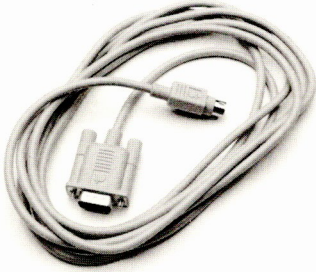
You can purchase *AppleCare* at any time, but it's a good idea to purchase it with your system, or at least before your warranty has expired, to avoid an owner-paid inspection.

## Appendixes



## Connecting to Macintosh 128K, 512K, and 512K Enhanced Computers

**T**HIS APPENDIX SHOWS YOU HOW TO CONNECT THE IMAGEWRITER II TO A Macintosh 128K, Macintosh 512K, and Macintosh 512K enhanced computer. If you want to connect to a newer Macintosh computer, see Chapter 3. If you want to connect the ImageWriter II to an Apple II computer, see Chapter 4. If you plan to connect the ImageWriter II to an AppleTalk network with a LocalTalk cable system, see the *ImageWriter II/LQ LocalTalk Option User's Guide*, then return to Chapter 5 in this book.



**Figure A-1**  
Macintosh Peripheral-8 Cable

After you've connected the printer to your computer, this chapter goes on to tell you how to test the connection. The test verifies that the computer can send data to the printer and that the printer can print the data. That way if a problem arises, you can trace the trouble to two *probable* areas: a loose connection or an improperly **configured** application (a word processor or **spreadsheet**, for example).

---

## Before you begin

This chapter assumes that you have installed the printer ribbon and loaded paper into the printer. You should also have completed a successful self-test of the ImageWriter II. If you have not completed these steps, see Chapter 2.

Before continuing, make sure you have the correct cable—the Macintosh Peripheral-8 Cable.

---

### ▲ Warning

If your serial interface cable does not have the proper connectors, don't try to make it fit; see your authorized Apple dealer before continuing. ▲

---

## Connecting your computer

To connect the ImageWriter II to your Macintosh 128K, Macintosh 512K, or Macintosh 512K enhanced, you'll complete these four steps:

1. Check to make sure you have the correct ImageWriter II **printer resource**.
2. Plug the printer cable into the printer and the Macintosh.
3. Use the Chooser desk accessory to prepare your Macintosh to use the ImageWriter II.
4. Test the connection between the printer and the computer.

---

## Checking your resource file

In order to use the ImageWriter with a Macintosh computer, you must have an ImageWriter printer resource in the System Folder on any disk that you use as a **startup disk**.

To find out if you have an ImageWriter II resource file, open the system folder on your startup disk. You should see a file there named ImageWriter. If you do, you have the software you need. If not, you need to add the file to your System Folder. Your authorized Apple dealer sells System Software Updates that come with instructions on installing the software you need. Follow the instructions given with that package to install the ImageWriter resource on your startup disks.

---

## Making Macintosh cable connections

With the correct printer resource installed, you can go on to connect the Macintosh Peripheral-8 Cable to your ImageWriter II and your Macintosh computer.

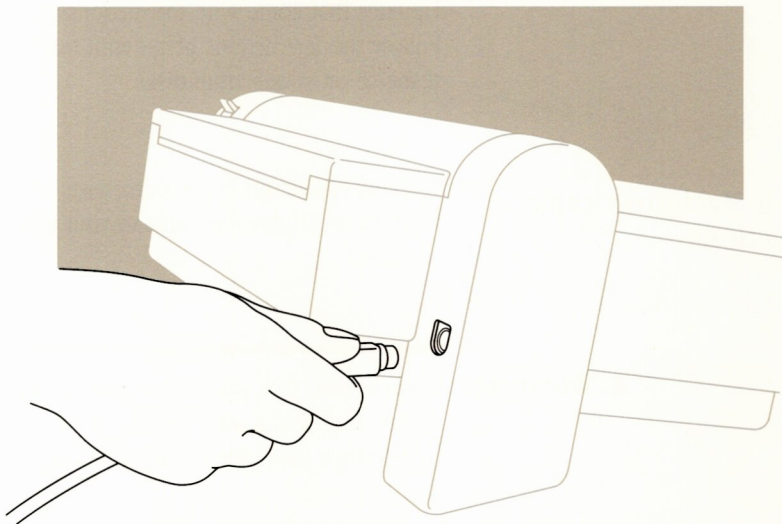
---

### ▲ Warning

Always make sure you have turned off both the computer and a peripheral device, such as a printer, before connecting or disconnecting them. Changing cables when the power is on can damage your equipment. ▲

1. Plug the 8-pin mini-circular connector on the printer cable into the ImageWriter II's **serial interface socket**. The Apple icon should face up. (See Figure A-2.)

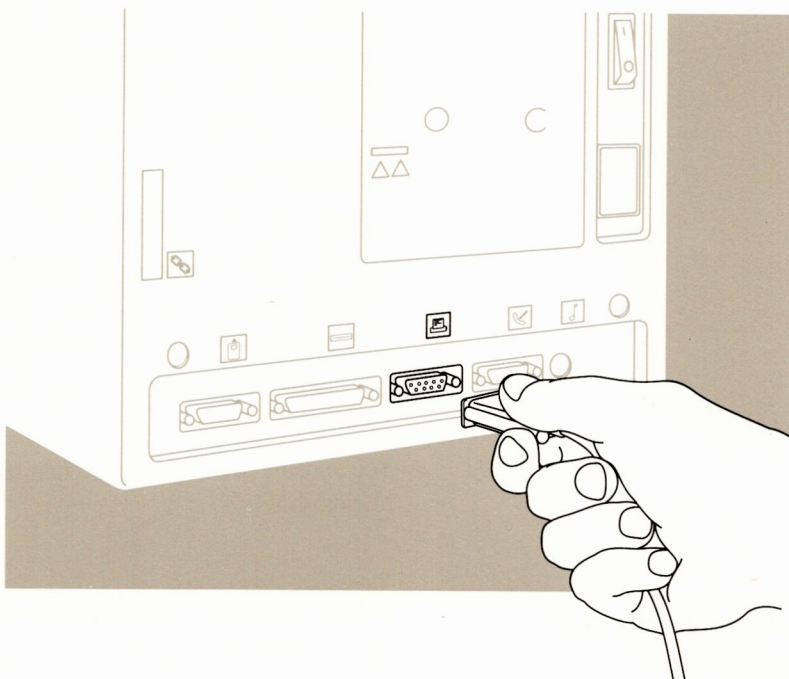
Make sure you get a firm fit. Loose connections can interfere with radios and televisions, scramble data, and even stop printing.



**Figure A-2**

Connecting the printer cable to the ImageWriter II

2. Hold the free end of the cable with the Apple icon facing up.
3. Plug the connector into the Macintosh printer **port**. (See Figure A-3.) If another connector (such as LocalTalk) occupies the printer port, connect to the **modem** port.



**Figure A-3**

Connecting the printer cable to the Macintosh printer port

---

## Selecting the ImageWriter II in the Chooser

With the printer resource installed and the printer cable connected to your printer and computer, you're ready for the final step—telling the computer what kind of printer you want to use, and which port you used to connect that printer. To do this, you use the Chooser desk accessory.

1. Make sure you have a startup disk in a drive and then turn on the Macintosh. You can also start up using your hard disk if you have one.
2. Pull down the Apple menu and check that a desk accessory called Chooser is available. If it is not available, you need to update your system software. See your authorized Apple dealer to obtain a System Software Update and follow the instructions given with that package.
3. Select Chooser from the Apple menu.
4. Select the ImageWriter icon.
5. If you have connected the ImageWriter II to the printer port, choose the printer port icon. If you have connected the ImageWriter II to the modem port, choose the modem port icon.
6. Click the close box to save your configuration and put the Chooser window away.

You're ready to test the connection between the ImageWriter II and your Macintosh.

---

## Testing Macintosh connections

Follow these steps to make sure that the connections between your printer and computer are working.

1. Press the Caps Lock key into its down position.
2. Hold down the Command and Shift keys while you press 4.

Your ImageWriter II should start printing the contents of the current Macintosh screen.

If it does not, check to make sure that both ends of the printer cable fit firmly into their ports. Also, open the Chooser and make sure that you've selected the ImageWriter icon and the icon for the correct port—either the printer or the modem port. Then go back and try the test again.

If the test still doesn't run, see Chapter 6, "General Troubleshooting."

## Controlling Printer Output

**I**F YOU NEED TO CHANGE PRINTER OUTPUT OR DO SOME TROUBLESHOOTING, THERE are several ways to change ImageWriter II default settings. This appendix tells you how to change the default settings.

For most people, changing the settings on the ImageWriter II is unnecessary because the default settings are adequate to handle their printing needs. In addition, programs like AppleWorks on the Apple II, and nearly all Macintosh applications, let you control printer output without changing the printer's settings.

If you do decide to change the settings, you can use any of four methods:

- Many Apple II application programs let you type in a **setup string**—a group of characters beginning with Esc or Control that change printer settings.
- You can write your own program in languages like BASIC or Pascal. Such a program becomes necessary when an application doesn't provide commands or allow setup strings to control printer output.
- You can reset ImageWriter II DIP switches. Once you flip a switch, the setting stays in effect until you reset the switch. For example, you might prefer to print in pica (10 characters per inch) most of the time, instead of the default, elite (12 characters per inch). If you can't change this setting from your word processing software, you can reset the relevant switches.
- If you use AppleWorks, you can create your own printer modifications and save them as a "custom printer" setup.

Before you consider what changes you might make, you should become familiar with the standard settings. The next section covers standard ImageWriter II settings.

---

## Standard settings for the ImageWriter II

Here is a partial list of standard settings for the ImageWriter II. These are the settings you're most likely to want to change. For a complete list, see Appendix D.

Maximum line width	8 inches
Left margin	0
Character set	American
Characters per inch	12
Lines per inch	6
Lines per page	66
Line feed after carriage return	None
Baud	9600 baud
Protocol	Hardware Handshake
Horizontal tabs	Cleared

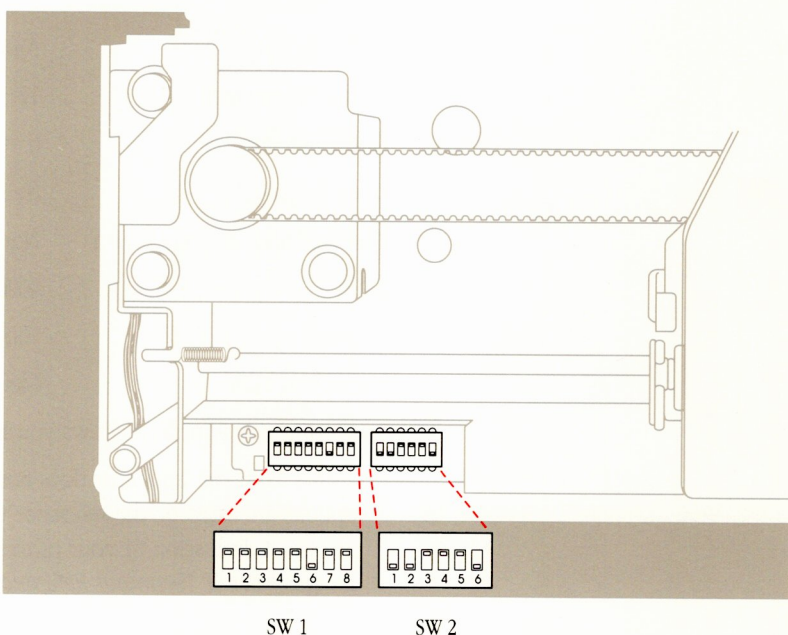
The rest of this appendix shows you how to change these settings.

❖ *By the way:* This appendix does not show all the possible options. All options are listed on the reference card at the back of this book. For a thorough discussion of your printer and its output options, see the *ImageWriter II Technical Reference Manual*.

---

## Changing settings with DIP switches

The ImageWriter II has two DIP (dual in-line package) switch blocks, designated SW1 and SW2. Both are located toward the lower-left corner of the printer. (You may have to slide the ribbon deck to the right in order to see them.) See Figure B-1.



**Figure B-1**  
Location of DIP switches

SW1 has eight switches and SW2 six switches (two of which you should never change: SW2-5 and SW2-6). Tables B-1 and B-2 show the default settings for each block and describe the functions of the switches.

If you are reading this section to help with troubleshooting, compare the actual switch settings on your printer with those shown in Figure B-1.

---

**▲ Warning** Do not touch switches SW2-5 and SW2-6. These are reserved for authorized Apple technicians to adjust hammer-fire timing. ▲

**Table B-1**

Default settings for SW1

Switch	Setting	Concern	Default
1	Open	Character set	American
2	Open	Character set	American
3	Open	Character set	American
4	Open	Page length	66 lines
5	Open	Skip performance	No
6	Closed	Characters per inch	Elite (12 cpi)
7	Open	Characters per inch	Elite (12 cpi)
8	Open	Line feed after carriage return	None

**Note:** Some references to DIP switches use *off* for *open* and *on* for *closed*.

**Table B-2**

Default settings for SW2

Switch	Setting	Concern	Default
1	Closed	Baud	9600
2	Closed	Baud	9600
3	Open	Communications protocol	DTR (handshake)
4	Open	Option card	No card

**Note:** SW2-5 and SW2-6 are factory-set. Do not change their settings.

### △ Important

If you have the 32K Memory Option or LocalTalk card, SW2-4 should be closed. If you have installed an Apple Serial Communications Card or other interface card that transmits at 300 baud, switches SW2-1 and SW2-2 should both be open. △

To explore the other available DIP switch options, see Appendix D.

---

## Using control characters and escape sequences

You can change various settings on the ImageWriter II by sending the printer either a **control code** or an **escape sequence**. Essentially, both of these send instructions to the printer. For example, there are instructions you can use that tell the printer to change to bold type, issue a form feed, and return to normal type.

With members of the Apple II family, you can communicate these instructions to the printer by pressing certain keys (after a PR#1 or as a setup string) or by writing commands into a program. For example, entering Control-L as a setup string sends a single-character instruction telling the printer to perform a form feed.

❖ *Note:* Beyond its command menus, the Macintosh can command the printer through programs, but not through typing a direct command.

**ASCII** stands for *American Standard Code for Information Interchange*. This code is a standard character set used by many computers and peripheral devices to process and communicate data.

If you wanted to write a program to send a form feed instruction to the printer, you would write a line using the control character's **ASCII** code, which is 12. Appendix C has a complete list of all ASCII codes. To send a form feed, an Applesoft BASIC program would have the line

```
40 PRINT CHR$(12)
```

You can also type escape sequence characters directly to the printer using the Esc (Escape) key (from within an application or after a PR#1 instruction). For example, to have the ImageWriter II print in boldface type, you would press Esc !

In a program, you would need to supply the ASCII codes for Esc (27) and for ! (33). As an alternative, you could enclose the exclamation point in double quotation marks—"!". Thus, your program line would look like this

```
50 PRINT CHR$(27); CHR$(33)
```

or this

```
50 PRINT CHR$(27); "!"
```

---

## Commonly used printer instructions

This section gives the most commonly used control codes and escape sequences. For others, see the reference card at the back of this manual and the *ImageWriter II Technical Reference Manual*. A sample configuration program follows these instructions.

- ❖ *By the way:* If you have an application program that you need to configure for printing, pay close attention to the following codes. Configuration programs often prompt you for information such as the code for boldface type, for underlining, and so on.

When typing sequences, do not include the spaces between the symbols or the hyphens that separate the word *Control* from the control character. Control means press the Control key and hold it down while pressing the character key. Esc means press the Esc key and then release it before pressing the next key.

Uppercase and lowercase are meaningful in escape sequences. That is, Esc-N and Esc-n are *different* instructions. If your Apple computer cannot generate lowercase characters, you'll need to write your instructions with ASCII character codes.

On the other hand, the case of characters makes no difference when writing control codes. Writing Control-n and Control-N in a program sends the same instruction.

**Table B-3**  
Turning special features on and off

Feature	On	ASCII	Off	ASCII
Boldface	Esc !	27 33	Esc "	27 34
Underlining	Esc X	27 28	Esc Y	27 89
Superscripts	Esc x	27 120	Esc z	27 122
Subscripts	Esc y	27 121	Esc z	27 122
Half-height characters*	Esc w	27 119	Esc W	27 87
Slashed zeros	Esc D Control-@ Control-A	27 68 0 1	Esc Z Control-@ Control-A	27 90 0 1

\*Half-height characters look best when printed in conjunction with 17 cpi.

**Table B-4**  
Selecting special features

Feature	Keystrokes	ASCII Equivalent
<b>Character size</b>		
Extended (9 cpi)	Esc n	27 110
Pica (10 cpi)	Esc N	27 78
Elite (12 cpi)	Esc E	27 69
Semicondensed (13.4 cpi)	Esc e	27 101
Condensed (15 cpi)	Esc q	27 113
Ultracondensed (17 cpi)	Esc Q	27 81
<b>Proportional spacing</b>		
Proportional pica	Esc p	27 112
Proportional elite	Esc P	27 80
<b>Lines per inch</b>		
6 lines per inch	Esc A	27 65
8 lines per inch	Esc B	27 66
<b>Print quality*</b>		
Draft	Esc a 1	27 97 49
Standard	Esc a 0	27 97 48
Near letter quality (NLQ)	Esc a 2	27 97 50

\*These codes override the control panel button setting.

**Table B-5**  
Selecting character sets

Language	Keystrokes	ASCII Equivalent
American	Esc Z Control-G Control-@	27 90 7 0
British	Esc Z Control-D Control-@ Esc D Control-C Control-@	27 90 4 0 27 68 3 0
German	Esc Z Control-C Control-@ Esc D Control-D Control-@	27 90 3 0 27 68 4 0
French	Esc Z Control-A Control-@ Esc D Control-F Control-@	27 90 1 0 27 68 6 0
Swedish	Esc Z Control-B Control-@ Esc D Control-E Control-@	27 90 2 0 27 68 5 0
Italian	Esc Z Control-F Control-@ Esc D Control-A Control-@	27 90 6 0 27 68 1 0
Spanish	Esc D Control-G Control-@	27 68 7 0
Danish	Esc Z Control-E Control-@ Esc D Control-B Control-@	27 90 5 0 27 68 2 0

**Table B-6**  
Alternate character sets

American	#	\$	@	[	\	]	â	`	{		}	~
British	£	\$	@	[	\	]	â	`	{		}	~
German	#	\$	§	Ä	Ö	Ü	â	`	ä	ö	ü	ß
French	£	\$	à	•	ç	§	â	`	é	ù	è	“
Swedish	#	\$	@	Ä	Ö	Å	â	`	ä	ö	å	~
Italian	£	\$	§	•	ç	é	â	ù	à	ò	è	ì
Spanish	£	\$	§	i	Ñ	¿	â	`	•	ñ	ç	~
Danish	#	\$	@	Æ	Ø	Å	â	`	æ	ø	å	~
Decimal	35	36	64	91	92	93	94	96	123	124	125	126
Hexadecimal	\$23	\$24	\$40	\$5B	\$5C	\$5D	\$5E	\$60	\$7B	\$7C	\$7D	\$7E

❖ *By the way:* To type a Spanish hyphen, press the single quotation mark key.

## Selecting Color

The color options work only when you have installed a color ribbon. The color option instruction is

Esc K *n*  
27 75 *d*

Here, the letter *n* represents a color number you must enter and *d* is the ASCII equivalent. For example, the escape sequence to turn on red printing is Esc K 1, which has the ASCII equivalent 27 75 50.

	Number (n)	ASCII code (d)
Black	0	48
Yellow	1	49
Red	2	50
Blue	3	51
Orange	4	52
Green	5	53
Purple	6	54

## Setting left margin

The escape sequence for setting the left margin is

Esc L *nnn*  
27 76

*nnn* stands for any three-digit number. For example, if you were to enter Esc L035, the printer would begin printing in the 36th character position, calculated from the zero position (not first position) marked by the left red ring on the paper bail.

## Setting where the top line prints

With pin-feed paper, use this escape sequence to make the current paper position the place where the ImageWriter II will print the top line on each page:

Esc v  
27 118

---

## A sample BASIC program

This program, written in Applesoft BASIC, gives a brief demonstration of how to turn various printer commands off and on and ends with a form feed to eject the printed page.

```
10 REM Demo printer controls
20 Print CHR$(4); "PR#1": Rem send to printer
30 Let ESC$ = CHR$(27): Rem save some keystrokes
40 Print "This is the default font"
50 Print ESC$; CHR$(33): Rem bold on
60 Print "This is boldface"
70 Print ESC$; "X": Rem underline on
80 Print "And this is underline bold"
90 Print ESC$; CHR$(34): Rem bold off
100 Print "And this is underline only"
110 Print ESC$; "Y": Rem underline off
120 Print "Back to default"
130 Print ESC$; CHR$(81): Rem ultracondensed
140 Print "No bold, no underline for ultracondensed"
150 Print "Okay, push the paper"
160 Print CHR$(12): Rem form feed
170 Print ESC$; "E": Rem elite type on
180 Print CHR$(4); "PR#0": Rem back to the screen
```

For more details on settings, see Appendix D, the reference card at the end of the book, and the *ImageWriter II Technical Reference Manual*.



## ASCII Codes

**Table C-1**

ASCII codes for normal characters

ASCII code	char	ASCII code	char	ASCII code	char	ASCII code	char
0	NULL	32	SPACE	64	@	96	`
1	SOH	33	!	65	A	97	a
2	STX	34	"	66	B	98	b
3	ETX	35	#	67	C	99	c
4	EOT	36	\$	68	D	100	d
5	ENQ	37	%	69	E	101	e
6	ACK	38	&	70	F	102	f
7	BELL	39	'	71	G	103	g
8	BS	40	(	72	H	104	h
9	HT	41	)	73	I	105	i
10	LF	42	*	74	J	106	j
11	VT	43	+	75	K	107	k
12	FF	44	,	76	L	108	l
13	CR	45	-	77	M	109	m
14	SO	46	.	78	N	110	n
15	SI	47	/	79	O	111	o
16	DLE	48	0	80	P	112	p
17	DC1(XON)	49	1	81	Q	113	q
18	DC2	50	2	82	R	114	r
19	DC3(XOFF)	51	3	83	S	115	s
20	DC4	52	4	84	T	116	t
21	NAK	53	5	85	U	117	u
22	SYN	54	6	86	V	118	v
23	ETB	55	7	87	W	119	w
24	CAN	56	8	88	X	120	x
25	EM	57	9	89	Y	121	y
26	SUB	58	:	90	Z	122	z
27	ESC	59	;	91	[	123	{
28	FS	60	<	92	\	124	
29	GS	61	=	93	]	125	}
30	RS	62	>	94	^	126	~
31	US	63	?	95	_	127	DEL

Table C-2

ASCII codes for inverse characters

ASCII code	char	ASCII code	char	ASCII code	MouseText	ASCII code	char
128	@	160	SPACE	192	🍏	224	`
129	A	161	!	193	🍏	225	a
130	B	162	"	194	▶	226	b
131	C	163	#	195	⌂	227	c
132	D	164	\$	196	✓	228	d
133	E	165	%	197	☑	229	e
134	F	166	&	198	↶	230	f
135	G	167	'	199	≡	231	g
136	H	168	(	200	←	232	h
137	I	169	)	201	⋮	233	i
138	J	170	*	202	↵	234	j
139	K	171	+	203	↑	235	k
140	L	172	,	204		236	l
141	M	173	-	205	↶	237	m
142	N	174	.	206	■	238	n
143	O	175	/	207	⏪	239	o
144	P	176	0	208	⏩	240	p
145	Q	177	1	209	⏪	241	q
146	R	178	2	210	⏩	242	r
147	S	179	3	211		243	s
148	T	180	4	212	└	244	t
149	U	181	5	213	→	245	u
150	V	182	6	214	▒	246	v
151	W	183	7	215	▒	247	w
152	X	184	8	216	□	248	x
153	Y	185	9	217	□	249	y
154	Z	186	:	218		250	z
155	[	187	;	219	◆	251	{
156	\	188	<	220		252	
157	]	189	=	221	≠	253	}
158	^	190	>	222	□	254	~
159	_	191	?	223		255	DEL



## **ImageWriter II Printer and Interface Specifications**

**Table D-1**

## Printer specifications

Print method:	<b>Dot matrix</b> , logic seek (line by line)		
Printing speed:	Draft maximum	250 cps @ 10 cpi	
	Standard maximum	180 cps @ 10 cpi	
	NLQ maximum	45 cps @ 10 cpi	
Character format:	Draft characters—up to 12 dots wide by 8 dots high		
	Standard characters—up to 7 dots wide by 8 dots high		
	NLQ characters—up to 16 dots wide by 16 dots high		
	Custom (down-loaded) characters—up to 16 dots wide by 8 dots high		
Standard characters	96 ASCII (alphanumeric and symbols)		
	28 European language characters		
	32 MouseText characters		
Vertical dot spacing:	1/72 of an inch		
Printed line length	8 inches maximum		
Horizontal <b>pitches</b> :	Characters per inch	Characters per line	Dots per inch (approx.)
	17	136	136
	15	120	120
	13.4	107	107
	12	96	96
	10	80	80
	9	72	72
	Proportional-1	variable	160
	Proportional-2	variable	144
Paper feed direction:	Forward and reverse		
Line spacing:	1/144 to 99/144 inch, selectable in increments of 1/144 inch		
Line feed speed:	Maximum 24 lps @ 6 lpi		

**Table D-1 (continued)**

## Printer specifications

---

Paper width:	3.5 to 9.5 inches pin to pin (pin feed), 10 inches maximum		
Paper thickness:	0.05–0.28 millimeter (0.002–0.011 inch) Original plus 3 copies maximum		
Paper feed method:	Selectable, friction or friction/pin-feed		
Paper types:	Single sheets Pin-feed paper (hole centers 4.0–9.5 inches)		
Ribbon:	Cassette containing black-inked fabric ribbon, 13 mm wide by 13,000 mm long, continuous Four-color ribbon, optional, 21 mm wide by 18,000 mm long, continuous		
Power options			
American:	120 volts AC $\pm$ 10%, 60 hertz		
Universal:	100 volts AC $\pm$ 10%, 50/60 hertz 120 volts AC $\pm$ 10%, 50/60 hertz 140 volts AC $\pm$ 10%, 50/60 hertz 200 volts AC $\pm$ 10%, 50/60 hertz 220 volts AC $\pm$ 10%, 50/60 hertz 240 volts AC $\pm$ 10%, 50/60 hertz		
Power consumption			
Operating:	180 watts maximum		
Standby:	20 watts maximum		
Data interface:	8-bit serial		
Weight:	11.36 kilograms (25 pounds)		
Dimensions:	Width	Depth	Height
	431.8	304.8	127.0 millimeters
	17.0	12.0	5.0 inches
Ambient Temperature			
Operating:	10° to 40° C (50° to 104° F)		
Storage:	–40° to +47° C (–40° to +116° F)		
Humidity			
Operating:	20% to 95% relative humidity, noncondensing		
Storage:	10% to 95% relative humidity, noncondensing		

---

**Table D-2**

ImageWriter II DIP switch settings

	<b>SW1-1</b>	<b>SW1-2</b>	<b>SW1-3</b>
American (default)	Open	Open	Open
Italian	Closed	Open	Open
Danish	Open	Closed	Open
British	Closed	Closed	Open
German	Open	Open	Closed
Swedish	Closed	Open	Closed
French	Open	Closed	Closed
Spanish	Closed	Closed	Closed
<b>SW1-4</b>			
Form length 11 inches (default)	Open		
Form length 12 inches	Closed		
<b>SW1-5</b>			
Perforation skip inactive (default)	Open		
Perforation skip active	Closed		
<b>SW1-6</b>		<b>SW1-7</b>	
10 cpi	Open	Open	
12 cpi (default)	Closed	Open	
17 cpi	Open	Closed	
160 dpi (proportional)	Closed	Closed	
<b>SW1-8</b>			
Carriage return only (default)	Open		
Carriage return plus line feed	Closed		

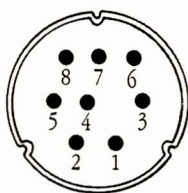
**Table D-2 (continued)**  
ImageWriter II DIP switch settings

	<b>SW2-1</b>	<b>SW2-2</b>
300 baud	Open	Open
1200	Closed	Open
2400	Open	Closed
9600 (default)	Closed	Closed
		<b>SW2-3</b>
Hardware handshake protocol (default)		Open
XON/XOFF protocol		Closed
		<b>SW2-4</b>
Option disabled (no option card, default)		Open
Option enabled		Closed

**▲ Warning** Do not adjust DIP switches SW2-5 and SW2-6. They are factory set to control hammer-fire timing. ▲

**Table D-3**  
Interface specifications

Data input form:	8-bit asynchronous serial: 1 start bit, 8 data bits, 1 stop bit (no parity)
Data input codes:	Characters: ASCII, 8- or 7-bit Graphics: 8-bit binary
Transmission speed:	300, 1200, 2400, or 9600 baud
Input <b>buffer</b> size:	2K, 32K with 32K Memory Option
Printer connector:	Mini-circular connector, 8-pin socket or equivalent
Cable connector:	Mini-circular connector, 8-pin plug or equivalent



**Figure D-1**  
8-pin mini-circular connector pinouts

**Table D-4**  
8-pin mini-circular connector pin assignments

Pin no.	Symbol	Description	Direction
1	DTR	Data Terminal Ready	Output
2	DSR	Data Set Ready	Input
3	TxD-	Transmit data -	Output
4	SG	Signal ground	
5	RxD-	Receive data -	Input
6	TxD+	Balanced transmit +	Output
7	NC	No connection	
8	RxD+	Balanced receive +	Input
Shield	PG	Protective ground	

**Table D-5**  
Mini-circular to RS-232 connections

Mini-circular connector (RS-422/423)	DB25-P (RS-232-C)	Symbol
1	5*	CTS
1	6*	DSR
1	8*	DCD
2	20	DTR
3	3	RXD
4†	7	GND
5	2	TXD
6	—	NC
7	—	NC
8†	—	GND
Shield		Shield

\*Jumpered together at DB25.

†Jumpered together at mini-circular connector.

---

# Glossary

**alignment notch:** The notch on the back panel that indicates where to position the left edge of a sheet of pin-feed paper.

**Applesoft BASIC:** An extended version of the BASIC programming language used with the Apple II family of computers.

**AppleTalk Network System:** The system of network software and hardware used in various implementations of Apple's communications network.

**application software:** A program that applies a computer's capabilities to some particular task, such as word processing, database management, graphics, or spreadsheet work.

**ASCII:** An acronym for *American Standard Code for Information Interchange*, pronounced ask-ee. A code for representing text characters and other data inside a computer and between a computer and any peripheral device.

**back cover:** The cover at the rear of the ImageWriter II that protects the pin-feed paper tractor.

**baud:** A unit of data transmission speed: the number of signal events per second. Sometimes, but not always, equivalent to *bits per second*.

**bit:** A contraction of *binary digit*. The smallest unit of data. A bit is either a zero or a one, an off or an on. The ImageWriter II takes a data byte composed of 8 bits.

**buffer:** An area of the computer's memory used as a *holding area* where information can be stored by one program or device and then read out by another at a different speed.

**byte:** A unit of information, often amounting to a single text character. A byte consists of eight bits.

**card:** See **peripheral card**.

**carriage return:** An ASCII character (decimal 13) that ordinarily causes a printer or display device to print the character following it at the left margin.

**carrier rod:** The metal rod on which the print-head assembly rides.

**cartridge support tabs:** The two plastic tabs that secure the ribbon cartridge to the ribbon cartridge deck.

**character set:** The entire set of characters that a printer can print.

**communications protocol:** A format or set of rules for sending and receiving data.

**computer paper:** See **pin-feed paper**.

**configuration:** The hardware and software elements that constitute a computer system.

**configure:** To change software or hardware actions by changing settings. You can configure hardware (a printer or interface card) by resetting physical elements like DIP switches or jumper blocks. Configurations can also be set or reset in software.

**continuous-form paper:** See **pin-feed paper**.

**control character:** A nonprinting character that controls or modifies the way information is printed or displayed. In the Apple II computer family, control characters have ASCII values between 0 and 31, and can be typed from a keyboard by holding down the Control key while pressing some other key.

**control code:** One or more nonprinting characters—included in a text file—whose function is to change the way a printer prints the text. For example, a program may use certain control codes to turn boldface printing on and off. See also **control character**.

**control panel:** On the ImageWriter II, the cluster of buttons and lights near the lower-right corner of the printer.

**Control Panel:** On the Macintosh and Apple IIGS, the software desk accessory through which you can set things like mouse-button click speed and speaker sound.

**data byte:** The basic unit of data the computer sends to the printer.

**data byte length:** The number of bits in a data byte. The ImageWriter II receives data in 8-bit data bytes.

**Data Terminal Ready:** The default communications protocol for the ImageWriter II. Also known as *DTR* or *hardware handshake*.

**default:** A value, action, or setting that a computer system assumes unless the user gives an explicit instruction to the contrary. For example, unless told otherwise, the ImageWriter II begins printing with a left margin set to the default value of zero.

**DIP switch:** *DIP* is an acronym for *dual in-line package*. A small block containing a number of switches. Setting these switches sets options on the device of which the switch is a part, like a printer or an interface card.

**dot matrix printer:** A printer, like the ImageWriter II, that forms characters with patterns of dots using the impact of print head wires on a ribbon.

**draft quality:** The fastest and least dense of the three print qualities available on the ImageWriter II. Draft mode is meant mainly for quick printouts of drafts for review or editing. Compare **standard quality** and **near letter quality**.

**8-pin mini-circular connector:** The small, round connector on the serial interface cable that plugs into the printer. Also known as an *8-pin mini-DIN connector*.

**eject:** To move paper out of the printer. You can eject paper by pressing the Form Feed button or by turning the platen knob clockwise.

**end-of-line character:** Any character that tells the printer that the preceding text constitutes a full line and may now be printed.

**Error light:** The red light that indicates a problem with the printer, such as being out of paper.

**escape sequence:** A sequence of keystrokes, beginning with the Escape key (Esc) or with the ASCII code for the escape character. Such sequences issue commands to the printer that control text formatting in a printout.

**expansion slot:** A connector inside some computers in which a **peripheral card** can be installed. Used for increasing functionality. Sometimes called a *peripheral slot*.

**fan-fold paper:** See **pin-feed paper**.

**font:** A complete set of type in one size and style of character.

**format:** The general shape and appearance of a printer's output, including page size, character width and spacing, line spacing, and other design matters.

**form feed:** An ASCII character (decimal 12) that causes a printer or other paper-handling device to advance to the top of the next page.

**Form Feed button:** A button on the ImageWriter II control panel that causes the printer to advance to the top of the next page.

**front cover:** The lid that covers the front of the ImageWriter II. Remove the front cover to gain access to the ribbon cartridge and DIP switches. The front cover must be firmly in place or the ImageWriter II will not print.

**front cover window:** The clear plastic piece in the upper portion of the front cover.

**hardware handshake:** A protocol that tells the computer to start or stop sending data by setting the RTS (Request to Send) line logic state. The ImageWriter II changes the line's state depending on the capacity of its input buffer. Also known as the *Data Terminal Ready* protocol. Compare **XON/XOFF**.

**hexadecimal:** The representation of numbers in terms of powers of sixteen, using the ten digits 0 through 9 and the six letters A through F. Often used instead of decimal numbers in programming and commonly referred to as *hex*. Programmers precede hex numbers with a dollar sign (\$), for example, \$14 or \$C9.

**icon:** An image that graphically represents an object, a concept, or a message.

**ImageWriter II/LQ LocalTalk Option:** A peripheral card that enables the printer to serve up to 31 computers on an AppleTalk network system.

**ImageWriter II SheetFeeder:** A device that holds up to 100 sheets of paper, feeds them individually into the printer, and stacks the printed pages.

**ImageWriter II 32K Memory Option:** A peripheral card that gives the ImageWriter II a 32,000-character memory buffer. This memory holds documents of up to 16 to 20 pages, freeing you to work at the computer while the printer prints.

**Integer BASIC:** A version of the BASIC language that processes numbers in integer (fixed-point) form rather than in decimal (floating-point) form. Available for the Apple II family of computers.

**interface:** Hardware or software that links the computer to a device, such as a printer or modem.

**interface card:** See **peripheral card**.

**K:** Short for *kilobyte*; equals 1024 bytes. A unit of measure for computer or disk memory.

**line feed:** The ASCII character that causes the printer to move the paper forward by one line.

**Line Feed button:** A button on the ImageWriter II control panel that causes the printer to advance the paper to the next line.

**line feed pitch:** The number of lines of text printed per vertical inch.

**LocalTalk cable system:** A system of connectors, cables, and cable extenders used to link computers and network devices, such as printers, print servers, and file servers, together in an AppleTalk network system.

**modem:** Acronym for *MODulator/DEModulator*; a peripheral device through which a computer can send and receive data over telephone lines.

**near letter quality (NLQ):** The highest quality print mode on an ImageWriter II. Although this mode prints more slowly than lesser quality print modes, the output is of high enough quality for important letters and reports. Compare **draft quality** and **standard quality**.

**network:** A group of individually controlled computers linked with each other and with peripherals. Through hardware and software, the computers can share information and other resources.

**On/Off switch:** A switch on the control panel of the ImageWriter II that you press to turn the printer on or off.

**output:** Data transferred from a computer to an external device such as a video display, printer, disk drive, or modem.

**override:** To modify or cancel one instruction with another. For example, you might override a DIP switch setting with an escape sequence.

**paper bail:** The metal bar that runs across the top of the platen. Its two rollers and plastic bar hold the paper next to the platen.

**paper clamps:** The clamps that keep pin-feed paper from popping off the tractors.

**paper guide:** The clear plastic plate that rides between the print head and the platen.

**paper loading:** A function performed on single sheets of paper by the Form Feed button. The paper load function loads a sheet of paper and sets its top of form to 1/6 inch from the top edge of the paper.

**paper feed selector:** The lever next to the platen knob. The lever's position determines how the printer moves paper. Press the lever up for pin feed and down for friction feed.

**paper thickness lever:** The lever at the right end of the platen that sets the friction-feed mechanism for one to four sheets of paper. The up position is for a single sheet of 16- to 24-pound bond.

**parallel interface:** An interface that transmits multiple bits simultaneously (usually in one-byte lengths). Compare **serial interface**.

**parity:** A redundant bit added to a group of data bytes to check for evidence of a transmission error. The ImageWriter II does not read a parity bit.

**peripheral card:** A removable printed circuit board that plugs into an expansion slot in a computer. Such cards can either transfer computer data to a peripheral device, such as a printer or modem, or expand the computer's own capabilities by adding extra memory or an extra microprocessor.

**pin-feed alignment icon:** The icon on the back panel of the printer that shows you where to position the left edge of a sheet of pin-feed paper.

**pin-feed paper:** Paper designed for computer printers. Each vertical edge has regularly spaced holes (pin holes) that the printer uses to advance the paper. Perforations separate each sheet and the individual sheets can be folded like the letter Z for stacking. Also known as *fan-fold paper*, *continuous-form paper*, or *computer paper*.

**pitch:** The number of characters per inch printed on a horizontal line.

**platen:** The rubber roller that serves as a backing for the paper during printing and paper loading.

**platen knob:** The knob at the right side of the printer. Turning the knob clockwise advances paper into the printer.

**port:** A socket on the back of a computer where you plug in a cable to connect a peripheral device, another computer, or a network.

**power cord:** The cord that connects the printer to its source of electricity.

**Power light:** The green light that tells you when the printer is turned on.

**power socket:** The socket at the back of the printer into which you plug the power cord.

**PR#:** In the Apple II family of computers, the PR# command sends output to a slot. For example, PR#1 sends output to the device located in slot 1. PR#0 returns output to the video display.

**printer resource:** A program that controls the exchange of information between a printer and the computer. You must have a separate printer resource for each type of printer that you want to use. Sometimes called a *printer driver*.

**print head:** The printer part that actually prints characters.

**print line:** The red line on the paper guide that indicates where the printer prints on the paper.

**printout:** Text and graphics printed on paper by a printer.

**protocol:** See **communications protocol**.

**RAM:** See **random-access memory**.

**random-access memory (RAM):** The part of the computer's memory that stores information temporarily while you're working on it. A computer with 512K of RAM has 512 kilobytes of memory available to the user. Information in RAM can be referred to in an arbitrary or random order, hence the term *random-access*.

**read-only memory (ROM):** Memory whose contents can be read, but not changed. Information is placed into read-only memory once, during manufacture; it then remains there permanently, even when the computer's power is turned off. Compare **random-access memory**.

**ribbon cartridge deck:** The platform that holds the ribbon cartridge.

**ribbon guide:** The rectangle of plastic that rises over the print head. The ribbon travels *between* the ribbon guide and the paper guide.

**ROM:** See **read-only memory**.

**RS-232:** A common data communications interface standard. The ImageWriter II follows this standard.

**Select button:** The button that determines whether the printer can accept data from the printer or instructions from other buttons on the control panel.

**Select light:** When the Select light is on, the printer can receive data from a printer. With the exception of the On/Off switch, none of the control panel buttons work when the Select light is on. When the Select light is off, all buttons work, but the printer cannot print.

**serial interface:** An interface that transmits data sequentially, one bit at a time. Compare **parallel interface**.

**serial interface cable:** The cable that connects the serial ports of two devices, such as those of a computer and a printer. See **serial interface**.

**serial interface socket:** The ImageWriter II socket that accepts the serial interface cable's 8-pin, mini-circular connector.

**setup string:** A group of characters that sends a format command to a printer. Some application programs, such as spreadsheets, give you the option of changing format, such as character width, by entering a setup string before printing.

**shielded cable:** A cable with a special metallic wrapping around its wires. This wrapping reduces radio-frequency interference.

**slot:** See **expansion slot**.

**software:** A collective term for programs, the instructions that tell the computer what to do. Software is usually stored on disks.

**spreadsheet:** An application program used for financial planning, cost estimates, and other number-crunching tasks. In a spreadsheet, information is laid out in columns and rows.

**standard quality:** The medium speed, medium quality print mode on an ImageWriter II. Standard mode is meant for everyday use such as informal letters and memos. Compare **draft quality** and **near letter quality**.

**start bit:** In data transmission, the one or two bits preceding a data byte that indicate the beginning of a character.

**startup disk:** A disk with all the necessary program files—such as the Finder and System files contained in the System Folder for the Macintosh—to set the computer into operation. Sometimes called a *boot disk*.

**stop bit:** In data transmission, the one or two bits following a data byte that indicate the end of a character.

**TAB:** An ASCII character that commands a device, such as a printer, to begin printing at a preset location. Similar to a typewriter tab, except that you can set computer tabs both horizontally and vertically.

**top margin:** The distance from the top edge of a page to the first printed line of text.

**tractor:** A belt with pins that guides pin-feed paper into the printer. The ImageWriter II has two tractors, one for each column of pin holes.

**tractor release lever:** In the down position, the lever locks its tractor into position. The up position frees the tractor for adjustment to a different paper width.

**2X font:** Fonts that are twice the size (and therefore contain twice the amount of information about the shape of the image) as the fonts shown on your screen. Macintosh computers use 2X fonts when printing to an ImageWriter II in Best quality mode to create a higher resolution image of each character.

**wires:** The nine elements in the print head that strike the ribbon and create a dot pattern on the paper. The dot pattern can be a text character or part of a graphic image.

**XON/XOFF:** A communications protocol that tells the computer to start or stop sending data by sending the appropriate character: either an XON or an XOFF. The capacity of the ImageWriter II's input buffer determines which character the device sends. Compare **hardware handshake**.

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