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TEXAS INSTRUMENTS

# microLaser Plus, microLaser Turbo, microLaser XL, microLaser XL Turbo Laser Printers User's Manual

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## Glossary

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*microLaser Plus, microLaser Turbo, microLaser XL, and microLaser XL Turbo Printers User's Manual*
Part No. 2569551-0002
Original Issue: December 1991
Revision A: March 1992

Changes may be periodically made to the information in this publication. Such changes will be incorporated in new editions of this manual.

Record the serial number and purchase date in the spaces provided below. The serial number is recorded on the label on the back of the printer. All correspondence concerning your printer should include both the serial number and the date you purchased it.

(circle one) ***microLaser:*** ***Plus*** ***Turbo*** ***XL*** ***XL Turbo***

**Serial Number:** _____ **Purchase Date:** _____



The equipment, as well as the programs that TI has created to use with them, are tools that can help people better manage the information used in their business; but tools—including TI products—cannot replace sound judgment nor make the manager's business decisions.

Consequently, TI cannot warrant that its products are suitable for any specific customer application. The managers must rely on their own judgment of what is best for their business.

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# Preface

This manual describes the operation of the Texas Instruments *microLaser™ Plus*, *microLaser Turbo*, *microLaser XL*, and *microLaser XL Turbo* printers.

The *microLaser Plus* and *microLaser XL* laser printers are compact, desktop printer suitable for use with individual workstations or small clusters of workstations.

The *Turbo* designation indicates the presence of a Turbo board, which contains a Reduced Instruction Set Computing (RISC) processor to enhance performance of PostScript printing.

The *microLaser Plus* and *microLaser Turbo* printers can print up to 9 pages per minute (16 for the *microLaser XL* and *microLaser XL Turbo* printers) on pages up to 8½ by 11 inches. (The printers can handle paper up to 8½ by 14 inches at slower speeds.)

## Standard Configuration and Features

A printer has the following standard configuration and features.

- 512K bytes of system memory
- Centronics®-type parallel interface
- One paper tray
  - Letter-size (8½ × 11 inch) on the *microLaser Plus* printer
  - A convertible tray that can accommodate either letter or legal (8½ × 14 inch) paper on the *microLaser XL* printer

- A4 size (210 mm by 297 mm) on international (220v–240v) models of all printers

- HP™ LaserJet™ Series II (HPII) emulation
- Seven resident HPII fonts (10-pitch and 12-pitch Courier, Courier Bold, and Courier Italic and 16.66-pitch Line Printer), in both portrait and landscape orientations
- Four user-definable *personal printer configurations* to allow easy switching between print jobs (non-Turbo printers only)
- Landscape and portrait orientations for all HPII fonts—resident, downloaded, or on font cards
- Automatic slanting of HPII fonts when italic style is selected by escape sequence

## Options for Non-Turbo Printers

Non-Turbo printers have additional capabilities if you add the following user-installable options.

- Additional memory in 1 MB increments up to 4 MB
- Serial interfaces (RS-232-C, RS-422, and AppleTalk®)
- PostScript® Level 1 page description language with either 17 or 35 PostScript fonts (non-Turbo printers only)
- Additional fonts and printer emulations on memory cards
- Trays for different paper sizes (available in half-letter, executive, letter, legal (Letter/Legal on the *microLaser XL* printer), A4, and B5)

- A second, 250-sheet paper feeder (500 sheets on the *microLaser XL* printer)
- Automatic envelope feeder holding up to 40 envelopes (70 envelopes on the *microLaser XL* printer)

## Turbo Configuration and Features

The *microLaser Turbo* and *microLaser XL Turbo* printers have the following features in addition to the features of the standard configuration.

- PostScript Level 2 page description language with 35 resident PostScript Level 2 fonts (replaces the PostScript Level 1 page description language on non-Turbo printers)
- A RISC processor, which provides up to a six-fold increase in PostScript processing speed over the non-Turbo PostScript board
- 2 M Bytes of PostScript memory in addition to system memory installed on the controller
- Automatic emulator switching between the PostScript interpreter and the HPII emulator (eliminates the need for personal printer configurations)
- Concurrent communication over more than one channel when an optional communication board is installed
- QuickSet program for remotely configuring the printer

## Optional Turbo Configurations

If you add an optional Turbo board to the printer, you can also add the following options.

- Additional PostScript memory, either 1 M Bytes or 4 M Bytes
- Comm+SCSI board with RS-232-C, RS-422, and AppleTalk serial connections plus a SCSI interface for connecting to an external hard drive for permanent storage of PostScript soft fonts

## About This Manual

This manual is arranged so you can easily find the information you need. Each page has a heading describing the subject matter.

## Conventions Used in This Manual

Unless otherwise specified, references to the *microLaser Plus* printer include the *microLaser Turbo* printer, and references to the *microLaser XL* printer include the *microLaser XL Turbo* printer.

Several international symbols are used throughout this manual to advise you of important information.

This symbol indicates a **Note** concerning operating procedures or information you should know.

This symbol alerts you to a **Warning** or **Caution** to help you prevent injury to yourself or damage to your printer.

This symbol tells you the current section continues on the next page.

## Contents

**Chapter 1—Common Operations**—describes the basic operations of the printer, including turning the printer on and off, printing, adding fonts, and user-repaceable items.

**Chapter 2—Using the Control Panel**—describes the functions of the control panel, including the liquid crystal display (LCD), the touch switches, and the indicator lights.

**Chapter 3—Using the HPII Emulator**—describes how the HPII emulator functions, including how to configure application software for use with the printer. This chapter also contains instructions for creating personal printer configurations in non-Turbo printers for the HPII emulator.

**Chapter 4—PostScript Printing in a Non-Turbo Printer**—tells you everything you need to know to succeed with PostScript printing in a non-Turbo printer. This chapter also contains instructions for customizing personal printer configurations for PostScript printing.

**Chapter 5—Global Options for Non-Turbo Printers**—describes the options that apply to all personal printer configurations.

**Chapter 6—Using a Turbo printer**—describes the features of your printer when you have a Turbo board installed.

**Chapter 7—Configuring a Turbo Printer**—tells you how to configure the printer when a Turbo board is installed.

**Chapter 8—Handling Paper**—describes how to load paper, use the manual feed slot, and clear paper jams. The chapter also contains some guidelines for selecting the best paper and envelopes for use with the printer.

**Chapter 9—Printing Reports**—describes how to print and interpret the status, font, and diagnostic reports.

**Chapter 10—Care and Troubleshooting**—describes cleaning instructions as well as troubleshooting procedures to help you diagnose and solve problems without a service call.

**Appendix A—Printer and Paper Specifications**—describes the specifications for the printer as well as the acceptable limits on paper for use with the printer.

**Appendix B—Options**—provides a brief description of the various options available for the printer.

**Appendix C--HPII Symbol Sets**—shows the characters in the symbol sets for the resident HPII fonts.

**Appendix D—HPII Emulator Control Codes and Escape Sequences**—provides experienced users a list of control codes and escape sequences in effect when the HPII emulator is selected.

**Appendix E—Using Global Commands**—includes the global commands that are available to all emulators, both for Turbo and non-Turbo printers.

**Appendix F—Changing the System Language**—describes how to switch the messages that appear on the LCD and on Help sheets from English to German, French, Spanish, or Italian.

**Appendix G—Shipping the Printer**—describes how to prepare both printers for shipping and how to reinstall them after shipping.

**Appendix H—Connecting to a Macintosh Computer**—provides information you need to use the printer with a Macintosh® computer.

**Appendix I—Warranty and Service**—describes how to get service for your printer and describes the warranty in effect.

**Appendix J—Texas Instruments Sales and Support**—provides the numbers and addresses you need to contact Texas Instruments about your printer. This appendix includes the Texas Instruments worldwide sales and support offices.

For your convenience the manual also contains a glossary and an index.

## About Other Manuals

This manual contains all of the information you need to operate the printer on a daily basis.

For initial installation of the printer, refer to the Installation Instructions that accompany your printer. To reinstall the printer, see "Reassembling the Printer" in Appendix G of this manual.

For details about the HPII emulator and PostScript Level 1 and Level 2 interpreters, standard and optional communication interfaces, and other technical information, you should order the *microLaser Series Laser Printers Technical Reference Manual* (TI Part No. 2559876-0001).

For detailed information about how to maintain and repair the printer, you should order the *microLaser Personal Laser Printer Maintenance Manual* (TI Part No. 2559877-0001) or the *microLaser XL High-Speed Laser Printer Maintenance Manual* (TI Part No. 2569510-0001).

A manual accompanies each option for the printer to describe installation and operation of the option.

**Note:** If your local Texas Instruments reseller cannot provide these manuals, you can order them directly from TI Express by calling 1-800-847-2787.

# 1
# Common Operations

When you have installed your printer following the procedure in the *Installation Instructions* that accompany your printer, you are ready to begin operations. If you have not yet installed your printer, refer to the *Installation Instructions*.

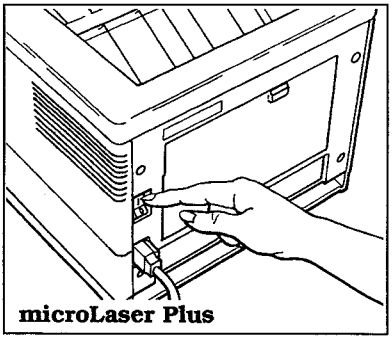
## This chapter tells you about

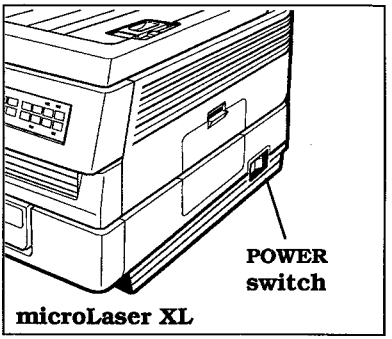
- Turning the printer on and off
- Preparing to print
- Adding fonts and emulators on memory cards

## Contents

# Turning On the Printer

To turn on the printer, set the Power switch to the on (I) position as shown in the following illustrations.




When you turn on the printer, it tests itself. You may notice some of the indicator lights blink on and off or you may hear some of the internal mechanisms activate.

When the LCD displays *Online*, the printer is ready to print a page. If you have selected the printer to go offline after completing the self-test, the LCD displays *Offline*.

---

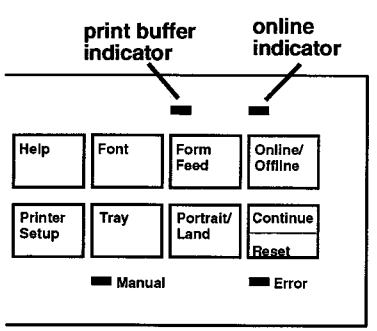
**Note:** The *microLaser XL* printer enters sleep mode immediately upon completing the self-test if no characters are in the print buffer. In sleep mode the printer reduces the speed of the cooling fan and the temperature of the fuser. This saves energy and wear on the printer and reduces the noise level.

Sleep mode ends automatically when you begin to print. You can tell when this happens by the change in the sound of the printer. After three minutes without print activity, the printer goes back into sleep mode.

---

If you turn off the printer with unprinted data in the print buffer, you lose that data. To avoid losing data, follow these steps when turning off the printer.

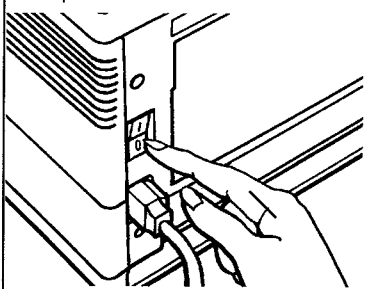
## HPII

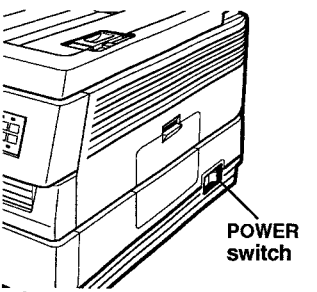



**a.** Check the print buffer indicator immediately above **Form Feed** If the yellow indicator is lighted, the print buffer holds unprinted data.

**b.** If the print buffer contains data, press **Form Feed** to print the data.

**c.** When the print buffer indicator is off, set the power switch to the off (**O**) position.



# Turning Off the Printer

## PostScript

To avoid losing data in the middle of a PostScript job, check the LCD on the control panel.

- If the LCD says *Idle*, it is safe to turn off the printer.
- If the LCD says *Processing*, the printer is in the middle of a print job. Wait until all pages print and the LCD says *Idle*.
- If the LCD says *Waiting*, the printer has paused in the middle of a print job. If the LCD does not say *Processing* after a short time, the print job is unlikely to complete, and you can safely turn off the printer.

Before sending data to your printer, you should make sure your printer is ready to receive the data. If your printer is set up incorrectly, you can waste time, paper, and toner and add unnecessary wear to the printer mechanism.

## Preparing to Print an HPII Print Job

To prepare your printer to print an HPII print job, follow these steps.

1. Check the print buffer indicator immediately above **Form Feed**. If the yellow indicator is lighted, you have unprinted data in the print buffer. Press **Form Feed** to print the page and clear the print buffer.

2. If you are unsure of the number of copies selected, check the number of copies and change it if necessary. Refer to Chapter 3 for non-Turbo printers or Chapter 7 for Turbo printers.

3. Make sure the printer is online. If it is online, the LCD displays *Online* and the green online indicator immediately above **Online/Offline** is lighted. If the printer is offline, press **Online/Offline** to put the printer online.

4. If you have a non-Turbo printer, make sure the current personal printer configuration is the one you want. When the printer is online, the LCD displays the emulation and number of the current personal printer configuration, for example, *HPII 1*. If the personal printer configuration is incorrect, refer to "Selecting a Personal Printer Configuration" in this chapter.

5. Make sure that you have an adequate amount of the right size and type of paper for printing. Change the paper and paper tray if necessary. For directions on changing paper, refer to Chapter 8, "Handling Paper."

After completing this quick check of your printer, follow the instructions with your software program for printing.

## Preparing to Print a PostScript Print Job

To prepare your printer to print a PostScript print job, follow these steps.

1. Check the LCD. It should say *Idle.*

   - If the LCD displays *Processing,* the printer is in the middle of a print job. Wait for it to finish.

   - If the LCD displays *Waiting,* the printer has stalled in the middle of a print job. To clear the print buffer, press **Online/Offline**. When the LCD displays *Rst to Kill Job,* press **Continue/Reset**.

2. Make sure the printer is online. If it is online, the LCD displays *Online* and the green online indicator immediately above **Online/Offline** is lighted. If the printer is offline, press **Online/Offline** to put the printer online.

3. If you have a non-Turbo printer, make sure the current personal printer configuration is the one you want. When the printer is online, the LCD displays the emulation and number of the current personal printer configuration, for example, *PS 1*. If the personal printer configuration is incorrect, refer to "Selecting a Personal Printer Configuration" in this chapter.

4. Make sure that you have an adequate amount of the right size and type of paper for printing. Change the paper and paper tray if necessary. For directions on changing paper, refer to Chapter 8, "Handling Paper."

After completing this quick check of your printer, follow the instructions with your software program for printing.

## Selecting a Personal Printer Configuration

A non-Turbo printer has four *personal printer configurations* that you can define during printer setup. A personal printer configuration allows you to define commonly needed configurations, which you can later recall with just a few steps. For example, if you have prepared personal printer configurations for word processing, spreadsheets, overhead projections, and envelopes, it takes only a few seconds to switch from one to the other.

Follow these steps to change personal printer configurations.

1. Press **Printer Setup**.
2. Press ▶ **Next**, if necessary, until the LCD displays *Setup:Pers Prt*.
3. Press ▼ **Select** to display the current personal printer configuration on the LCD.
4. Press ▶ **Next** until the LCD displays the personal printer configuration you want to use.
5. Press ▼ **Select** to select a personal printer configuration.
6. Press **Online/Offline**.

The printer goes back online. If the new personal printer configuration changes printer emulators, the printer initializes the new emulator before going online.

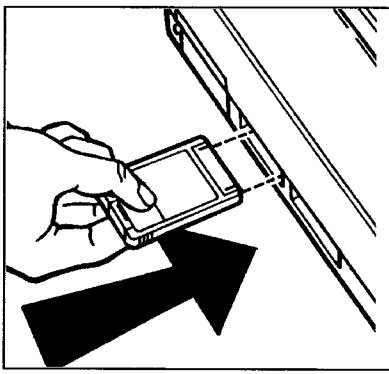
**Note:** You can also change the personal printer configuration with escape sequences from the host computer. Refer to "Using Global commands" in Appendix E.

## HPII Fonts on Font Cards

You can add HPII fonts to the printer using font cards. You can insert a font card in either of the two slots on the left side of the printer.

**Caution: Always turn the printer off before inserting a font card into the printer. Inserting a font card while the printer power is on can destroy data on the font card.**

To insert a font card, follow these steps.



**a.** Turn the printer off.

**b.** Hold the font card label-side up by the end opposite the pins.

**c.** Insert the font card into either of the slots on the left side of the printer and firmly push the card until it slides into place.

**d.** Turn the printer on.

After you have installed a font card, you can select fonts from it using the **Font** or **Printer Setup** switch or through software commands.

**Note:** Since the printer can rotate portrait fonts into landscape fonts, all fonts on a font card are available to you in both orientations. All fonts can also be converted to slanted fonts in response to escape sequences.

## Downloaded Fonts

A downloaded font is sent to the printer from the host and stored in the printer's memory. The downloaded font is available to the printer as long as the printer is *not* turned off, the font is *not* erased from memory, and the printer emulator is *not* changed. Downloaded fonts are specific to an emulator and cannot be used in other emulators.

The number of fonts that you can download at one time depends on the amount of memory in your printer and the size of the fonts.

- Downloaded HPII fonts require varying amounts of memory depending on the size, the weight, and symbol set of the characters.
- Most downloaded PostScript fonts require 65K to 80K bytes of memory.

The instructions for downloading fonts are supplied by the font vendor. Some software packages download fonts as needed. Other software packages require that you download a font manually before using it.

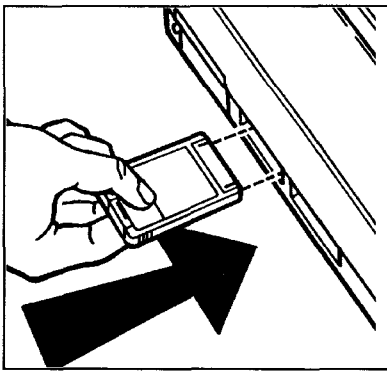
**Note:** Downloaded fonts occupy significant amounts of memory. If you frequently download a number of fonts, you may want to install additional memory boards.

## Adding Emulators

You can add printer emulators to the printer using emulation cards. The printer has two slots for font or emulation cards on the left side of the printer. You can insert an emulation card in either of these slots.

**Caution: Inserting an emulation card while the printer power is on can destroy data on the emulation card. Always turn the printer off before inserting an emulation card into the printer.**

To insert an emulation card, follow these steps.



**a.** Turn the printer off.

**b.** Hold the emulation card label-side up by the end opposite the pins.

**c.** Insert the emulation card into either of the slots on the left side of the printer and firmly push the card until it slides into place.

**d.** Turn the printer on.

After you have installed an emulation card, you can select it the same way as you select resident emulators.

- Using the printer setup process
- Using global commands described in Appendix E

Consumables refer to the components of the printer that you must replace from time to time. The frequency that you need to replace the consumables in your printer depend upon the type of printer you have and the type of printing you do.

Follow the installation instructions that accompany each consumable kit. Always dispose of used consumables in accordance with local regulations.

**Caution: Use only new consumables from Texas Instruments. Substandard supplies can permanently damage the printer and void warranties and maintenance contracts.**

## Adding Toner

A new toner cartridge supplies sufficient toner to print approximately 3,000 average pages (6,000 on the *microLaser XL* printer). On an average page, the toner covers 4 percent of letter-size paper. If you normally print pages with graphics or boldface, or if you have adjusted the contrast switch for darker printing, you may print fewer pages before adding toner. Similarly, if you normally print on small paper or print on only half a page, you can print more pages without adding toner.

The printer indicates it is out of toner by displaying the message *Add Toner* on the LCD.

When this message appears, the printer stops printing, goes offline, and lights the red **Error** indicator. When this occurs, you need to add toner before continuing.

**Note:** On the *microLaser Plus* printer, the toner cartridge remains attached to the developer cartridge. On the *microLaser XL* printer, the toner cartridge is discarded after you add toner.

## Changing the Developer Cartridge

A new developer cartridge should last approximately 25,000 average pages (30,000 on the *microLaser XL* printer).

When the number of pages on the developer cartridge reaches the expected life, the printer indicates you should replace the developer cartridge by displaying the message *Dvlp. Life Over* on the LCD.

When the number of pages on the developer cartridge reaches 110% of the expected life or the printer runs out of toner, whichever occurs first, the red **Error** indicator lights and processing stops until you replace the developer cartridge and add toner.

**Note:** On the *microLaser XL* printer when you print the first page after changing a developer cartridge, the printer performs a self adjustment which can last up to 90 seconds.

## Changing the OPC Cartridge

A new OPC cartridge should last approximately 50,000 average pages (60,00 on the *microLaser XL* printer). This means you should usually replace the OPC cartridge every other time you change the developer cartridge. When the number of pages on the OPC cartridge reaches the expected life, the printer indicates you should replace the OPC cartridge by displaying the message *OPC Life Over* on the LCD.

When the number of pages on the OPC cartridge reaches 110% of the expected life, the red **Error** indicator lights and processing stops until you replace the OPC cartridge.

**Note:** You do *not* need to replace the OPC cartridge until it reaches 110% of its expected life. As long as print quality remains adequate to your needs, you can wait to change the OPC cartridge.

# 2
# Using the Control Panel

## This chapter tells you about

- Interpreting messages on the liquid crystal display (LCD)
- Using the switches on the control panel in HPII and PostScript modes
- Interpreting the indicators

## Contents

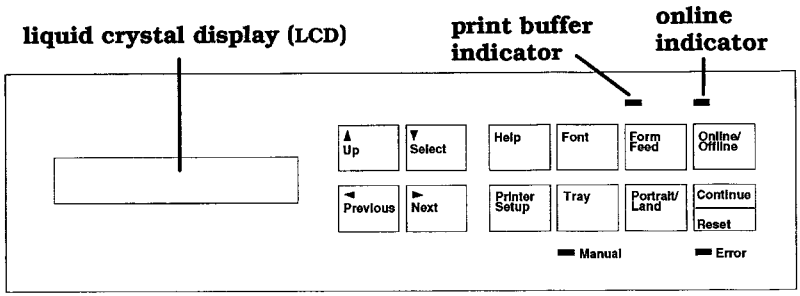
# Contents

# Overview of the Control Panel

The control panel tells you the current condition of the printer and gives you control over the operations of the printer. The control panel consists of the following.

- Liquid crystal display (LCD)
- Twelve touch switches
- Four indicators

The following illustration shows the control panel.



# Liquid Crystal Display (LCD)

The LCD on the control panel displays one line of up to 16 characters. The LCD informs you of the following.

- Printer status
- Error conditions
- Setup and other switch options

**Note:** The printer can display messages in German, French, Spanish, and Italian in addition to English. Refer to Appendix F for details.

## Printer Status Messages

The LCD informs you of the current status of the printer. When no error condition exists, the printer displays one of the following status messages.

| | |
|---|---|
| *Self Test* | The printer is testing its internal circuitry. The self-test occurs whenever you turn the printer on. When the test is over, the LCD displays *Test Completed.* |
| *Warming Up* | The fusing unit is warming up and is not yet hot enough to print. |
| *Online* | The printer can receive data from the host. Next to *Online*, the LCD displays the emulator and the number of the current personal printer configuration (on non-Turbo printers) or the active port (on Turbo printers) |
| *Offline* | The printer *cannot* process, receive, or print data. |
| *Mixing Toner* (microLaser XL only) | The printer is adjusting the mixture of toner in the developer to assure a consistent print density. The adjustment usually takes only a few seconds, but as the level of toner in the developer drops, the adjustment takes longer. |
| *Switching Ports* (Turbo only) | The printer is changing the active port. |

## Error Condition Messages

When a condition exists that requires your attention, the printer displays an error condition message on the LCD. The action you should take depends on the error condition.

- When an error requires no immediate attention, the error condition message alternates with printer status messages. For example, when the page count on the developer cartridge reaches the expected life, the LCD alternates *Dvlp. Life Over* with the status message.

- If an error requires immediate attention, the LCD displays only the error condition message and the red **Error** indicator lights. You must correct the error condition before continuing. For example, if the LCD displays *Clear Paper Jam*, you must locate and clear the jam and then press **Continue/Reset** before resuming printing.

- If an error condition is detected during the power-up self-test, you can usually continue using the printer in a limited fashion. For example, if the power-up self-test detects an error in the only 1 MB memory board in your printer, you can still print using the HPII emulator, which does *not* require the memory. You need to press **Continue/Reset** to continue following a power-up error message.

## Menu Messages

By pressing some control panel switches, you can enter a menu. The printer displays menu items as messages on the LCD during the selection process. These messages are described in the sections for the individual switches in this chapter and in the setup chapters.

# Switches

The 12 touch switches on the control panel are a primary means of controlling the printer.

The following describes the functions of the different touch switches on the control panel.

| | |
|---|---|
| **Online/ Offline** | Selects whether the printer is online (can receive and process data) or offline (cannot process data); with the *Busy Offline* setup option, you can determine whether a non-Turbo printers can receive data while offline (see Chapter 5) |
| **Printer Setup** | Defines personal printer configurations for non-Turbo printers and ports for Turbo printers; prints reports; establishes global printing parameters |
| **Help** | Prints information to help you set up and operate the printer |
| **▲ Up, ▶ Next, ▼ Select, ◀ Previous** | Move you through menu messages so that you can select which options to use |
| **Font** | Selects the typeface, pitch, and symbol set of the font (*non-functional in PostScript mode*) |
| **Portrait/ Land** | Selects the orientation of the image on the page, either portrait or landscape (*non-functional in PostScript mode*) |
| **Form Feed** | Prints data currently in the print buffer (*non-functional in PostScript mode*) |
| **Tray** | Selects which paper tray supplies the paper or whether to use manual feed |
| **Continue/ Reset** | Returns the printer to service after an error has occurred |

# Pressing a Switch

The location of the switches is indicated by colored squares on the control panel. The mechanical portion of the switches is hidden behind the plastic of the control panel. To use a switch, follow these steps.

1. Place the tip of your finger in the middle of the colored square that indicates the switch.

2. Press the switch. You should feel the mechanical portion of the switch depress, and you may hear a faint clicking sound.

3. Remove your finger from the switch.

You may notice a slight delay from the time that you press a switch until the message on the LCD changes. For example, you can expect a pause when the printer goes online.

# Online/Offline Switch

Pressing **Online/Offline** determines whether the printer is online or offline with the host. **Online/Offline** works as a toggle switch.

- Pressing **Online/Offline** while the printer is online takes the printer offline.
- Pressing **Online/Offline** while the printer is offline puts the printer back online.

## Online Condition

The online condition is the active state for the printer. The online printer can receive and print data from the host.

When the printer is online, the green online indicator immediately above **Online/Offline** lights and the LCD displays the message *Online* followed by the emulator and number of the current personal printer configuration (for non-Turbo printers) or the active port (for Turbo printers).

The following switches work while the printer is online.

- **Printer Setup**
- **Tray**
- **Form Feed** (HPII mode only)
- **Portrait/Land** (HPII mode only)
- **Font** (HPII mode only)

**Note:** If you press one of these switches while the printer is online, the printer returns online immediately after you select one of the configurable values. If you press one of these switches while the printer is offline, the printer remains offline until you press **Online/Offline**.

## Offline Condition

The offline printer *cannot* process or print data. The printer must be offline for you to use the following switches.

- **Help**
- **Continue/Reset**
- **▲ Up**
- **◀ Previous**
- **▼ Select**
- **▶ Next**

On a non-Turbo printer, the printer must also be offline to change the following setup parameters.

- The formlength value if HPII is the emulator.
- The PostScript communication option (including AppleTalk) if *PostScript* is the emulator.

The printer can be offline for two reasons.

- You took it offline by pressing **Online/Offline**.
- An error forced it offline.

If you took the printer offline, the printer signals the host to stop sending data *unless* you have a non-Turbo printer and have set the *Offline Busy* option to *No*. See the section entitled "Busy Offline" in Chapters 5.

If the printer was forced offline by an error, the red **Error** indicator lights and the LCD displays an error message. The printer never receives data while it is offline because of an error. To put the printer back online after an error, you must correct the error and press **Continue/Reset**.

# Help Switch

Pressing **Help** prints useful information to help the beginner or infrequent user. The information contained on the help sheets varies depending on what you are doing when you press **Help**. For example, if you are in the printer setup process, pressing **Help** prints information you need at the current menu level.

The printer must be offline for **Help** to function.

Before pressing **Help**, make sure the print buffer is empty.

- In HPII mode, check the yellow print buffer indicator immediately above **Form Feed**. If the indicator is lighted, press **Form Feed** to print the page before pressing **Help**.

- In PostScript mode, the LCD should say *Idle*. If it says *Processing*, allow the print job to complete before pressing **Online/Offline**. If it says *Waiting*, the LCD displays *Rst to Kill Job* when you press **Online/Offline**. When this happens, press **Continue/Reset** to clear the print buffer and continue.

**Note:** The printer can print help sheets in German, French, Spanish, and Italian in addition to English. Refer to Appendix F for details.

# Arrow Switches

The arrow switches (**▲ Up**, **▼ Select**, **◀ Previous**, and **▶ Next**) help you select the options from the menus displayed on the LCD after you press any of the following switches.

- **Printer Setup**
- **Font**
- **Tray**
- **Portrait/Land**

When the LCD displays a menu, pressing arrow switches moves you through your options as follows.

- Pressing **◀ Previous** or **▶ Next** displays other values at the same level on the menu.
- Pressing **▼ Select** selects the displayed value and moves you down to the next lower level on the menu. If you are on the lowest level, pressing **▼ Select** selects the currently displayed value and keeps you on the same level.
- Pressing **▲ Up** moves up to the next higher level.

# Font Switch

In HPII mode, pressing **Font** displays the font portion of the setup menu on the LCD.

**Note:** The **Font** switch does *not* function when the printer is in PostScript mode.

When you define the font, you determine what the printer uses to represent data received from the host. The following three factors together determine the font.

- Typeface
- Pitch/point size
- Symbol set

## Typeface

The typeface is the name that describes the shape of the font. The printer has the following resident typefaces.

| | |
|---|---|
| Courier | 10 pitch and 12 pitch |
| **Courier Bold** | 10 pitch and 12 pitch |
| *Courier Italic* | 10 pitch and 12 pitch |
| **Line Printer** | 16.66 pitch only |

If you add fonts to the printer by inserting a font card or by downloading fonts, the names of the additional typefaces also appear on the LCD for you to choose. The printer assigns typeface names to unnamed downloaded fonts, using *DF1* for the first downloaded font, *DF2* for the second, and so on.

If you select the typeface of a nonresident font and then remove the font card or erase the downloaded font, the printer defaults to the Courier typeface.

## Pitch/Point Size

The pitch or point size defines the size of the characters in the font.

- Pitch is the number of characters per inch, which defines the size of fixed-width typefaces such as Courier and Line Printer. The larger the number, the smaller the characters in the font.

- Point size is the height of a font, which defines the size of proportional typefaces such as Times Roman and Helvetica. The larger the number, the larger the characters in the font.

The printer displays on the LCD only those pitches or point sizes for the selected typeface currently in printer memory—whether resident, downloaded, or on a font card.

If you select the pitch or point size of an added font and then remove the font card or erase the downloaded font, the printer selects the nearest available size for that typeface. If the typeface is no longer available, the printer uses the closest available size in the Courier typeface.

The following table shows the maximum characters per line in the different pitches.

| Orientation | Paper Size | 10 cpi | 12cpi | 16.66 cpi |
|---|---|---|---|---|
| Portrait | Letter | 80 | 96 | 133 |
| | Legal | 80 | 96 | 133 |
| | A4 | 77* | 93* | 129* |
| | Half letter | 50 | 60 | 83 |
| | B5 | 67 | 80 | 111 |
| Landscape | Letter | 106 | 127 | 176 |
| | Legal | 136 | 163 | 226 |
| | A4 | 112 | 135 | 188 |
| | Half letter | 81 | 97 | 135 |
| | B5 | 94 | 113 | 157 |

*The printer can fit as many characters on A4 paper as on letter paper if you send the printer the correct global command. (Refer to Appendix E.)

## Symbol Set

The symbol set determines which character to print to represent data received from the host. For example, the dollar sign character ($) has a hexadecimal value of 24. This same data value can be rendered as ¤ in the ISO-2 symbol set and ¥ in the ISO-57 symbol set. Refer to Appendix B for the complete charts of resident HPII symbol sets.

You can select only those symbol sets that are available in the selected typeface. The resident typefaces support all of the following symbol sets.

| | | |
|---|---|---|
| Roman-8 | ISO-11 | ISO-61 |
| ECMA-94 | ISO-14 | ISO-69 |
| PC-8 | ISO-15 | ISO-84 |
| PC-8 DN | ISO-16 | ISO-85 |
| PC-850 | ISO-17 | German |
| ISO-2 | ISO-21 | Spanish |
| ISO-4 | ISO-25 | Legal |
| ISO-6 | ISO-57 | Roman extension |
| ISO-10 | ISO-60 | |

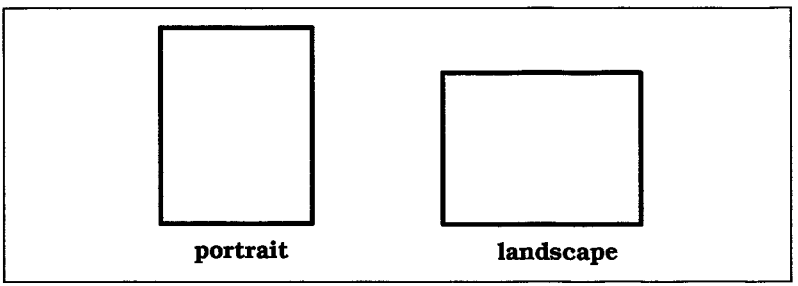
**Note:** The factory default value for symbol set is PC-8, which is compatible with most PC applications. If your application assumes the same default as a LaserJet printer, you should probably change the symbol set to Roman-8.

# Portrait/Land Switch

In HPII mode pressing Portrait/Land lets you change the orientation of the printing on the page.

**Note: Portrait/Land** does *not* function while the printer is in PostScript mode.

The printer can print across the width of a page (portrait orientation) or the length (landscape orientation). All fonts—whether resident, downloaded or from a font card—are usable in either orientation.




- Most routine printing, such as correspondence, sales proposals, and reports, is printed in portrait orientation.
- Spreadsheet reports, overhead projector presentations, and full-page graphics are often printed in landscape orientation.

If you change orientation in the middle of a print job, the printer prints the data in the print buffer and then changes orientation for subsequent pages.

# Form Feed Switch

Pressing **Form Feed** in HPII mode prints all of the data in the print buffer. The printer does *not* need to be offline for the **Form Feed** switch to function.

**Note: Form Feed** does *not* function while the printer is in PostScript mode.

Under most circumstances you do *not* need to press **Form Feed** to print the data in the print buffer because the printer automatically prints when one of the following occurs.

- The host sends enough lines to exceed the selected form length.
- The host sends a form-feed character (ASCII 0CH).
- A partial page is in the print buffer when a Turbo printer switches active ports.

If the host stops sending data to the printer without meeting one of these three conditions, the printer does *not* print the contents of the print buffer. When the print buffer contains data, the yellow print buffer indicator lights immediately above **Form Feed**. Pressing **Form Feed** prints this data.

The **Tray** switch defines how to feed paper to the printing mechanism. When you press **Tray**, you have the following options depending on the configuration of your printer.

- Tray 1—the standard paper tray
- Manual—the manual feed slot used for nonstandard stock, such as envelopes, card stock, transparencies, pressure-sensitive labels, or alternate paper sizes
- Tray 2—appears if the optional paper feeder is installed
- Limitless—appears if the optional paper feeder is installed
- Envelope—appears if the envelope feeder is installed

**Note:** If you change how you want to feed paper in the middle of a HPII print job, the printer prints the data in the print buffer and then changes the tray for subsequent pages. You cannot use **Tray** to change trays in the middle of a PostScript job.

Refer to Chapter 8, "Handling Paper," for a description of how to use the standard paper tray and the manual feed slot. Refer to the manual included with the optional paper feeder and envelope feeder for use of those options.

## Using Limitless Mode

When limitless mode is selected, the printer tries to feed paper from the optional paper feeder. If the optional paper feeder is empty and the standard paper tray holds the same size paper as the optional paper feeder, the printer switches automatically to the standard paper tray.

**Note:** If you reload the optional paper feeder, the printer switches back to the optional paper feeder even if the standard paper tray contains paper.

# Continue/Reset Switch

The **Continue/Reset** switch has the following functions depending on when and how you press it.

- Continuing after an interruption
- Performing a complete system reset

The printer must be offline for **Continue/Reset** to function.

## Resuming Printing

The printer indicates a user action is required by alternating a *Hit Reset* message on the LCD with another error message. The following circumstances are the most commonly encountered error conditions requiring you to press **Continue/Reset**.

- Paper jams
- Low toner
- Memory exceeded
- Communication errors
- Opening the side-access door on the *microLaser XL* printer

**Note:** If the printer is configured for PostScript, the *Hit Reset* message does *not* appear.

### Reset Following Paper Jams

The printer detects when a paper jam occurs but *cannot* detect when you have cleared the jam. Pressing **Continue/Reset** lets the printer know you have removed the obstruction. Refer to Chapter 7, "Handling Paper," for the procedure to follow when clearing a paper jam.

### Reset After Adding Toner

When the printer runs out of toner, the LCD displays *Add Toner* and the **Error** indicator lights. You *cannot* proceed until you install a complete toner kit. After adding toner

and changing the cleaning pad and waste toner bottle, press **Continue/Reset** to resume printing.

## Reset Following Memory Errors

If you have downloaded fonts or are trying to print a large graphic, the printer can run out of memory while processing a page. Pressing **Continue/Reset** clears the error condition but does *not* correct the cause To prevent a recurrence of the error, do one of the following.

- Install additional, optional memory.
- Reduce the number of downloaded fonts.
- Reduce the size or resolution of graphics.

**Note:** If you have filled memory with downloaded fonts, you might need to perform a complete system reset described on the next page before printing a status or font report.

## Reset Following Communication Errors

If the printer detects an error in transmitted data, the printer goes offline, displays *Comm Error* on the LCD, and lights the **Error** indicator. If you press **Continue/Reset** following a communication error, the printer resumes processing and ignores any recurrence of the communication error.

Sometimes resuming processing is *not* the best response to a communication error. For example, if the communication error is the result of an incompatibility between the host and the printer, resuming processing leaves the incompatibility uncorrected, so the printer prints only garbled data.

# Continue/Reset Switch

The best response for many communication errors is to use **Continue/Reset** to perform a system reset, and then to correct the underlying problem before restarting the print job. Refer to the following section entitled "Performing a Complete System Reset."

**Note:** When the printer is stopped by a communication error, you can press **Printer Setup** and change the communication parameter without performing a system reset.

## Reset After Opening the Side-Access Door

If you open the side-access door on a *microLaser XL* printer without replacing the waste toner bottle, the LCD displays a false waste-toner error when you try to print. The HPII message is *Replace Waste Toner Bottle*; the PostScript message is *Waste Toner Full.*

You can clear this error condition by pressing **Continue/ Reset**. If pressing **Continue/Reset** does *not* clear the error, refer to "Correcting a False Waste Toner Error" in Chapter 10.

## Performing a Complete System Reset

You can force a complete system reset by pressing and holding **Continue/Reset** for several seconds until the LCD displays ***Reset***. A system reset does the following.

- Returns the system configuration to the defaults for the current personal printer configuration (for non-Turbo printers) or the current port (for Turbo printers)
- Clears the receive buffer and the print buffer
- Erases all downloaded fonts and macros *not* designated as permanent fonts

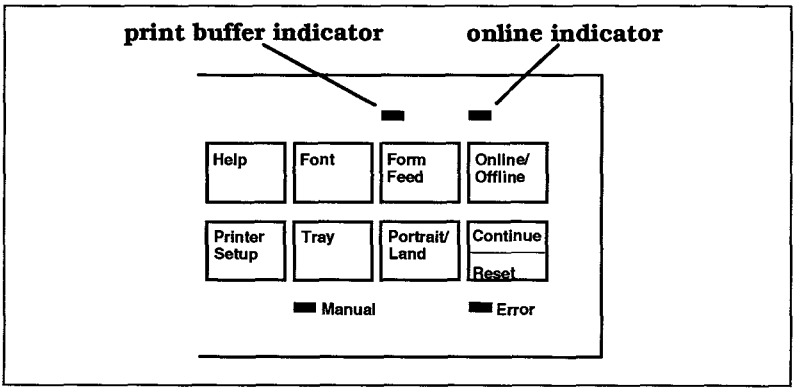
A system reset can be helpful under the following circumstances.

- You want to free some memory without erasing permanent downloaded fonts or macros.
- You want to clear both the receive buffer and the print buffer to cancel additional printing on a job.
- You want to return the printer to the known state of the personal printer configuration or port and remove changes made by escape sequences.

# Indicators

The control panel has the following four indicators to help you tell at a glance the condition of the printer.

- Online (above **Online/Offline**)
- Print buffer (above **Form Feed**)
- **Manual**
- **Error**




## Online Indicator

The green online indicator, immediately above **Online/ Offline**, does the following.

- Lights when the printer is online
- Blinks while the printer is receiving data (unless communicating over an AppleTalk line)

When the printer is online, it can receive, process, and print data. When the printer is offline (the online indicator is off), the printer *cannot* process or print data. A Turbo printer can never receive data while offline. A non-Turbo printer can receive data while offline depending on the value of the Offline Busy option.

## Print Buffer Indicator

The yellow print buffer indicator, immediately above **Form Feed**, lights when the print buffer contains unprinted data. If the printer has received software commands but no printable characters, the print buffer indicator remains off.

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**Note:** The print buffer indicator functions only in HPII mode. In PostScript mode, the LCD indicates whether the print buffer contains information. If the LCD displays *Processing* or *Waiting*, the print buffer contains data. If the LCD displays *Idle*, the print buffer is empty.

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## Manual Indicator

The yellow **Manual** indicator lights when the printer is ready to print a page that requires you to feed paper manually for one of the following reasons.

- You selected manual paper feeding during setup.
- You selected the *Manual* value using the **Tray** switch.
- You selected manual paper feeding through the software on the host.

## Error Indicator

The red **Error** indicator lights when a condition exists that requires your intervention. For some conditions, for example, the paper tray being ajar or empty, the printer turns off the **Error** indicator as soon as you correct the condition. Other conditions, such as paper jams and toner being out, require you to press **Continue/Reset** to turn off the **Error** indicator and clear the condition.

Conditions that require no immediate attention, for example, the developer cartridge being near the end of its life, display a message on the LCD but leave the **Error** indicator unlighted.

# 3
# Using the HPII Emulator

## This chapter tells you about

- Hardware used by the HPII emulator
- Configuring application software for the HPII emulator
- Preparing personal printer configurations to print with the HPII emulator in non-Turbo printers

## Contents

# HPII Hardware Considerations

All printers, Turbo and non-Turbo, are equipped with the HPII emulator. The HPII emulator requires only 512 KB of memory to function; however, the following circumstances may require you to add memory.

- Full page, high resolution graphics
- Numerous downloaded fonts or macros
- A large receive buffer (for basic printers) or several port receive buffers (for Turbo printers)

**Note:** Adding memory to the Turbo board does *not* increase the memory available to the HPII emulator. If you need to add memory for the HPII emulator, you must add a 1 MB memory board.

# Printing with Application Software

The HPII emulator gives you access to software written for the most widely distributed laser printer. Although the HPII emulator cannot match PostScript for flexible fonts or high resolution graphics, it does an adequate job in most cases, and it is preferable to PostScript under the following circumstances.

- You are printing from an application that does *not* have a PostScript driver.
- You are printing plain text or plain text and bit-mapped graphics and want to take advantage of the faster processing time of the HPII emulator.
- You want to use special fonts that are available only in the HPII emulator.

## Configuring Software for HPII Printing

To configure your application software to print with the HPII emulator, you should select the printer driver for HP LaserJet Series II. You might also see this listed as PCL4. Avoid selecting the drivers for HP LaserJet Series III and PCL5. These drivers are not fully compatible with the HPII emulator.

When your software is configured for the HPII emulator, most print features, such as fonts, margins, and orientation, are handled by the printer driver. The settings you have defined for the HPII emulator are usually not important.

## Printing in the Absence of a HPII Printer Driver

If you want to print from an application that does not have printer driver that is compatible with the HPII emulator, you can still take advantage of some of the features of your printer.

- You can define the font, orientation, tray, number of copies, and so on using the switches on the control panel.
- For non-Turbo printers, you can create up to 4 personal printer configurations to store frequently used configurations. Once you have created the personal printer configurations, you can recall them easy with just a few keystrokes. (See the procedure in this chapter for details.)
- The host can configure the printer remotely using the global commands described in Appendix E to change the printer setting.
- For Turbo printers, you can use the QuickSet utility to generate the global commands automatically.

# Using the Default HPII Configuration

The defaults for the four personal printer configurations are based on the option boards installed in the printer. Regardless of the option boards installed on your printer, at least one of the default personal printer configurations is set to the following values.

| | |
|---|---|
| Emulator | HPII |
| I/O | StdParallel |
| Tray | Tray1 |
| Orientation | Portrait |
| Form Length | 60 |
| Font | Courier, 10-pitch, PC-8 |

If these are the values you want to use, or if you are using application software that configures the printer for you, then you do not need to create a custom personal printer configuration. Use the procedures on the following pages to create a custom personal printer configuration.

# Changing the Font

A font is a pattern of characters the printer uses to represent data received from the host. The font is determined by the typeface, pitch/point size, and symbol set.

Follow these steps to change the font.

1. Select the HPII personal printer configuration that you want to change.

2. Press **Online/Offline** so that the LCD displays *Offline*.

3. Press **Font**. The LCD displays *Font:Typeface*.

4. Press ▼ **Select**.

5. Press ▶ **Next** until the name typeface you want to select appears on the LCD then press ▼ **Select**.

6. Press ▼ **Up** then ▶ **Next**. The LCD displays *Font:Pitch/Point*.

7. Press ▼ **Select**.

8. Press ▶ **Next** until the pitch or point size you want appears on the LCD then press ▼ **Select**.

9. Press ▲ **Up** then ▶ **Next**. The LCD displays *Font:SymSet*.

10. Press ▼ **Select**.

11. Press ▶ **Next** until the symbol set you want to select appears on the LCD then press ▼ **Select**. For most PC applications the symbol set should be the default, PC-8. For some applications written specifically for the HP LaserJet printer, the symbol set should be ROMAN-8. For international and other specialized needs, select one of the symbol sets shown in Appendix C.

12. Press **Online/Offline**.

# Changing the Orientation

Follow these steps to change the orientation.

1. Select the HPII personal printer configuration that you want to change.

2. Press **Portrait/Land**.

3. Press ▶ **Next** until the orientation you want to select appears on the LCD then press ▼ **Select**.

# Changing the Form Length

The *Form Length* value establishes the line spacing to use with the HPII emulator. The printer calculates the line spacing based on the following.

- Number of lines per page
- Size of the currently installed paper tray in the selected paper tray slot (if Manual is selected, the printer uses Letter size)

For example, the standard line spacing is six lines per inch, which yields 60 lines on a letter-size page. (Six lines are lost due to top and bottom margins.) If you load legal paper, the printer keeps the six lines per inch spacing, which yields 78 lines per legal-size page.

If you set a form length of 66 lines on a letter-size page (instead of the standard 60), the printer compresses the distance between each line so that you are actually printing 6.6 lines per inch. Although you can set the number of lines per page between 5 and 128, you should make sure that your font size is appropriate to the line spacing. More lines per page require smaller characters for maximum readability.

The printer calculates line spacing during setup using the current paper tray for the selected paper tray (letter-size if manual is selected). Make sure you have the correct paper tray installed when you define a personal printer configuration.

Follow these steps to change the form length.

1. Press **Online/Offline**.
2. Press **Printer Setup**. The LCD displays *Setup:Pers Prt.*
3. Press ▼ **Select**.

4. Press ▶ **Next** until the personal printer configuration you want to change appears on the LCD then press ▼ **Select**. The LCD displays *Emulator*.

5. Press ▼ **Select**. The LCD displays *Emulator*=HPII.

6. Press **Select**. The LCD displays the current form length (lines per page).

   - Press ▶ **Next** to increase the number of lines per page.

   - Press ◀ **Previous** to decrease the number of lines per page.

7. When the correct number appears on the LCD, press ▼ **Select**.

8. Press **Online/Offline**.

# Changing the Number of Copies

If you need to print more than one copy of an original, it may be more efficient to set the printer to print multiple copies per page than it is to send the data multiple times to the printer. When you select multiple copies, the printed pages for multipage documents are not collated. The savings in printing time and your time can be worth the effort to collate the pages manually after printing.

The factory default number of copies is 01.

To change the number of copies, follow these steps.

1. Make sure HPII is the emulator of the current personal printer configuration. If not, change to a personal printer configuration with HPII as the emulator.

2. Press **Printer Setup**.

3. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays *Misc:Copies* then press ▼ **Select**.

5. Press ▶ **Next** to increase the number of copies (up to 99); press ◀ **Previous** to decrease the number of copies.

6. Press ▼ **Select**.

**Note:** You should always reset copies to 01 after printing a job with multiple copies; otherwise, you could waste paper, toner, and time the next time you print.

# Changing the Default Symbol Set

The Default Symbol Set option defines the HPII symbol set to use when the selected symbol set is unavailable because you have removed a font card or erased a downloaded font. Appendix C shows all of the resident HPII symbol sets. The factory default symbol set is PC-8.

To change the default symbol set, follow these steps.

1. Make sure HPII is the emulator of the current personal printer configuration. If not, change to a personal printer configuration with HPII as the emulator.

2. Press **Printer Setup**.

3. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays *Misc:Def Sym Set* then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays the symbol set you want to select then press ▼ **Select**.

# Changing Communication Options

The printer has the following communication choices.

- *StdParallel*—Centronics-type parallel interface
- *Bi-Parallel*—a parallel interface that allows the printer to send status information to the host if the host supports this interface
- *RS232*—requires an optional Serial Interface Board
- *RS422*—requires an optional AppleTalk+RS-422+ RS-232 Board

If you select one of the optional serial interfaces, you have additional communications values to define as shown in the following table. (The default values are shown in bold)

| Port | Option | Value |
|---|---|---|
| **RS232** | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 |
| | Data bits | 7,**8** |
| | Stop bits | **1**,2 |
| | Parity | Odd, Even, Mark, Space, **None** |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), DTR (high or low), Pin 11 (high or low), ETX/ACK |
| RS422 | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 |
| | Data bits | 7,**8** |
| | Stop bits | **1**,2 |
| | Parity | Odd, Even, Mark, Space, **None** |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), ETX/ACK |

# Changing Communication Options

If you are using either of the serial communications, follow these steps to select communications options.

1. Press **Online/Offine** until the LCD displays *Offline.*

2. Press **Printer Setup.**

3. Press ▶ **Next** until the LCD displays *Setup:Pers Prt* then press ▼ **Select.**

4. Press ▶ **Next** until the LCD displays the number of the HPII personal printer configuration you want to change then press ▼ **Select.**

5. Press ▶ **Next** until the LCD displays *I/O* then press ▼ **Select.**

6. Press ▶ **Next** until the LCD displays the serial interface you want to use then press ▼ **Select.**

7. Press ▶ **Next** until the LCD displays the option you want to change then press ▼ **Select.**

8. Press ▶ **Next** until the LCD displays the value you want to select then press ▼ **Select.**

9. If you want to change other communcation options, press ▲ **Up** and repeat steps 7 and 8.

10. Press **Online/Offline.**

# Changing Auto Continue

The value of the *Auto Continue* option determines how the printer responds to some conditions that halt printing.

- When *Auto Continue* is on, the printer waits about 10 seconds after halting printing then resumes as if you had pressed **Continue/Reset**.

- When *Auto Continue* is off, the printer waits for you to press **Continue/Reset** before continuing.

*Auto Continue* affects the following situations.

- Memory errors

- Communication errors

- Paper-size errors (The printer feeds from the standard paper tray if you do *not* manually feed within 10 seconds.)

If the printer is connected to a network, turn *Auto Continue* on to avoid tying up the printer indefinitely. If the printer is on your desk, turn *Auto Continue* off for greater control. The factory default value for *Auto Continue* is *Off*.

To change auto continue, follow these steps.

1. Make sure HPII is the emulator of the current personal printer configuration. If not, change to a personal printer configuration with HPII as the emulator.

2. Press **Printer Setup**.

3. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays *Misc:Auto Cont* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays *Off* or *On* then press ▼ **Select**.

# 4
# PostScript Printing in a Non-Turbo Printer

## This chapter tells you about

- About the PostScript version used on the basic printer
- Required equipment for PostScript printing
- Setting up a personal printer configuration for PostScript printing
- Operational considerations while doing PostScript printing

## Contents

# Contents

Although you can buy a *microLaser* printer with only the HPII emulator, most *microLaser* printers are configured for PostScript printing. Before a non-Turbo printer can do PostScript printing, it must have a PostScript board and additional memory.

## PostScript Boards

A non-Turbo printer can take one of two PostScript boards. The only difference between these two boards is the number of PostScript fonts available on them. One adds 17 fonts; the other adds 35 fonts.

## Additional Memory Boards

The printer requires at least 1.5 MB of memory to do PostScript printing. You need to install additional memory boards if you want to do any of the following.

- Print on legal paper
- Download numerous fonts
- Print complex graphics, especially when the source is color or high-resolution black-and-white halftones
- Print multiple fonts on a single page

### Printing on Legal Paper

The basic printer must have at least one 1 MB memory board in addition to the standard 1.5 MB of memory. Without this additional memory, the page image is truncated to letter-size before printing.

### Downloading Fonts

Most downloaded PostScript fonts require 65K to 80 K bytes of memory. The printer ignores attempts to download more fonts than can fit in memory, If you try to print a font that failed to download, the PostScript prints Courier instead.

If you download too many fonts, the printer also may not have enough memory to print. When this happens, the printer returns to the online idle state without printing or returns a *limitcheck* error status.

## Printing Complicated Graphics

Some application software requires more than one 1 MB memory board when printing complex graphic images. This is most common when printing from a Macintosh computer, but it occurs on other computers as well, especially when printing color or high-resolution black-and-white halftone images.

If you are printing a complex image and the printer returns to the online idle state without printing or returns a *limitcheck* error status, you may need to add another 1 MB memory board to your printer.

## Printing Numerous Fonts on a Page

Before printing a PostScript font, the printer must store an image of the font in memory. The printer must do this for every point size of every font on a page. If you have a large number of different point sizes and fonts, the printer may not have enough memory to print the page. When this happens, the printer returns to the online idle state without printing or returns a *limitcheck* error status,

# Configuring Application Software

A non-Turbo printer has PostScript Level I, the most widely used page-description language available today. The version of the PostScript language on your printer was prepared by Adobe Systems. The new or special features incorporated into this version are described in the *microLaser Series Laser Printers Technical Reference Manual.*

The process you follow to configure your application software depends upon whether your host is a PC or an Apple Macintosh computer.

## Configuring PC Software

Before you can print a PostScript print job on a PC, your application software must be configured for PostScript printing. Usually this involves defining a PostScript printer driver. Some PostScript printer drivers are generic and can be used with all current PostScript Level I printers. Many PostScript printer drivers, such as the one for Microsoft Windows 3.0, contain specific information about printer models.

If your printer driver contains such specific information, select the *microLaser* model that applies to your printer, either PS17 (17 fonts) or PS35 (35 fonts). For Microsoft Windows 3.0, you can use the *microLaser* printer drivers that accompany the printer.

If the correct *microLaser* model is not available, substitute the Apple Laserwriter Plus. This driver usually prints adequately, but it does *not* give you software control over the optional paper feeder and envelope feeder.

**Note:** A Laserwriter Plus driver gives you access to 35 fonts. If your printer is a Model PS17, you must limit yourself to the 17 fonts available on the printer.

## Configuring a Macintosh Computer

PostScript is the most common printing environment for the Macintosh computer. To optimize the functionality of your printer, install the Paper Tray Manager™ software that accompanies your printer.

**Note:** To a Macintosh computer, all PostScript printers are "Laserwriters" regardless of the brand name and model.

PostScript uses scalable fonts, which are fonts that you can print in virtually any size. Consequently, the only information you need to know about a font is its name. PostScript can print the font in any size that that you need.

## PS17 Fonts

Times® Roman
**Times Bold**
*Times Italic*
***Times Bold Italic***

Helvetica®
**Helvetica Bold**
*Helvetica Oblique*
***Helvetica Bold Oblique***

Symbols set

Courier
**Courier Bold**
*Courier Oblique*
***Courier Bold Oblique***

Helvetica Narrow®
**Helvetica Narrow Bold**
*Helvetica Narrow Oblique*
***Helvetica Narrow Bold Oblique***

αβχδεφγηιφκλμνοπθρστυϖωξψζ

## PS35 Fonts

Times® Roman
**Times Bold**
*Times Italic*
***Times Bold Italic***

Helvetica®
**Helvetica Bold**
*Helvetica Oblique*
***Helvetica Bold Oblique***

Palatino® Roman
**Palatino Bold**
*Palatino Italic*
***Palatino Bold Italic***

**ITC Bookman® Demi**
***ITC Bookman Demi Italic***
ITC Bookman Light
*ITC Bookman Light Italic*

*ITC Zapf Chancery® Medium Italic*
ITC Zapf Dingbats®
Symbols set

Courier
**Courier Bold**
*Courier Oblique*
***Courier Bold Oblique***

Helvetica Narrow®
**Helvetica Narrow Bold**
*Helvetica Narrow Oblique*
***Helvetica Narrow Bold Oblique***

ITC Avant Garde® Book
*ITC Avant Garde Book Oblique*
**ITC Avant Garde Demi**
***ITC Avant Garde Demi Oblique***

New Century Schoolbook
**New Century Schoolbook Bold**
*New Century Schoolbook Italic*
***New Century Schoolbook Bold Italic***

✡✢✣✤✥✦✧★✯✪✫✬✭✮✰✱✲
αβχδεφγηιφκλμνοπθρστυϖωξψζ

# PostScript Communication Protocols

When PostScript is the emulator, you can choose between the following four PostScript communication (PSCOMM) protocols.

- Standard—the most common protocol on PostScript printers; the protocol to choose if you usually print only PostScript files and your printer serves only one workstation
- Binary—a protocol developed by Adobe Systems that, among other features, allows you to transmit binary data to the PostScript interpreter
- TINet—a protocol developed by Texas Instruments that allows you to switch printer emulations reliably without loss of data; the protocol to choose if you plan to switch between emulations using software commands, especially in a multiuser environment
- AppleTalk—the primary protocol for the Apple Macintosh computer; this option only appears when your printer has an optional AppleTalk board installed.

**Note:** To change the PostScript communication protocol, the printer must be offline when you press **Printer Setup**.

# Using a Default Configuration

The easiest way to set up your printer for PostScript printing is to use one of the default personal printer configurations. When a PostScript board is installed, the printer generates default personal printer configurations based on the communications options available as shown in the following table.

**Default PostScript Personal Printer Configurations**

| Parameter | Prs Prt 1 | Prs Prt 2 | Prs Prt 3 | Prs Prt 4 |
|---|---|---|---|---|
| **PostScript without optional communications** | | | | |
| Emulator | PS | HPII | HPII | HPII |
| PSComm | TINET | | | |
| I/O | StdParallel | | | |
| **PostScript with Serial Interface Board installed** | | | | |
| Emulator | PS | PS | PS | HPII |
| PSComm | TINET | TINET | TINET | |
| I/O | RS-232 | StdParallel | RS-232 | |
| Baud | 9600,8,1,N | | 9600,8,1,N | |
| Flow control | Xon/Xoff | | DTR | |
| **PostScript with AppleTalk Board installed** | | | | |
| Emulator | PS | PS | PS | HPII |
| PSComm | AppleTalk | TINET | TINET | |
| I/O | | StdParallel | RS-232 | |
| Baud | | | 9600,8,1,N | |
| Flow control | | | Xon/Xoff | |

If one of the default personal printer configurations is appropriate for you, follow these steps to ensure the factory default settings are in effect.

1. Press **Printer Setup**.

2. Press ▶ **Next** until the LCD displays *Setup:Pers Prt* then press ▼ **Select**.

3. Press ▶ **Next** until the LCD displays the number of the default personal printer configuration you want to use then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays *Set Fac Def* then press ▼ **Select**.

   The LCD displays *Set Fac Def:No*.

5. Press ▶ **Next** until the LCD displays *Set Fac Def:Yes* then press ▼ **Select**.

Your printer is now configured for PostScript printing.

# Selecting a Custom PostScript Communication Protocol

If you want to use a different PostScript communication protocol than TINet or AppleTalk, follow these steps.

1. Press **Online/Offine** until the LCD displays *Offline*.

2. Press **Printer Setup**.

3. Press ▶ **Next** until the LCD displays *Setup:Pers Prt* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays the number of the personal printer configuration you want to change then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays *Emulator* then press ▼ **Select**.

6. Press ▶ **Next** until the LCD displays *PS* then press ▼ **Select**.

7. Press ▶ **Next** until the LCD displays the *PSCOMM* option you want then press ▼ **Select**.

As soon as you select the PostScript communication protocol, the printer goes back online using the new personal printer configuration.

# Changing the Serial Communication Options

The following table shows your serial communication options with the default values in **bold**.

| Port | Option | Value |
|---|---|---|
| **RS232** | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 |
| | Data bits | 7,**8** |
| | Stop bits | **1**,2 |
| | Parity | Odd, Even, Mark, Space, **None** |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), DTR (high or low), Pin 11 (high or low), ETX/ACK |
| RS422 | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 |
| | Data bits | 7,**8** |
| | Stop bits | **1**,2 |
| | Parity | Odd, Even, Mark, Space, **None** |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), ETX/ACK |

If you are using RS422 communications or values other than the default values, follow these steps to select communications options.

1. Press **Online/Offine** until the LCD displays *Offline*.
2. Press **Printer Setup**.
3. Press ▶ **Next** until the LCD displays *Setup:Pers Prt* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays the number of the PostScript personal printer configuration you want to change then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays *I/O* then press ▼ **Select**.

6. Press ▶ **Next** until the LCD displays the serial interface you want to use then press ▼ **Select**.

7. Press ▶ **Next** until the LCD displays the option you want to change then press ▼ **Select**.

8. Press ▶ **Next** until the LCD displays the value you want to select then press ▼ **Select**.

9. If you want to change other communcation options, press **Up** and repeat steps 7 and 8.

10. Press **Online/Offline**.

# Changing the Tray Setting

Although you can change the tray setting as part of printer setup, it is easier to use the **Tray** switch. To do so, follow these steps.

1. Press **Tray**.

2. Press ▶ **Next** until the LCD displays the paper source you want to use then press ▼ **Select**.

The printer goes back online and you are ready to print.

# Flushing a PostScript Job in Progress

If you press **Online/Offline** while the printer is in any condition other than idle, the LCD displays *Rst To Kill Job.*

- If you do *not* press **Continue/Reset**, the printer completes the current job before going offline.

- If you press **Continue/Reset** in response to this message, the LCD displays the message *Flushing Job*, and the printer discards partial pages in the print buffer, all data in the receive buffer, and all subsequent data until receiving an end-of-job character (04H). The printer prints completed pages in the print buffer.

If you press **Continue/Reset** and the job terminates without an end-of-job character, the LCD displays *Flushing Job* until the job timeout is exceeded. Under some circumstances, the printer may *not* return online. To recover from this error, take one of the following actions.

- Send an end-of-job character (Control-D) from the host.

- Turn the printer off and then back on again.

# PostScript Error Handling

## Paper Tray Error Message

The PostScript interpreter does *not* have a *paper tray* message to indicate a missing paper tray. If the selected tray is *not* in the printer, the LCD displays a *paper out* error message.

## Loss of Data at Paper Jams

If a paper jam occurs while *PostScript* is the emulator, the data for the jammed page may be lost, requiring you to send it to the printer again. Depending on where the paper jammed in the printer, the printer may also print a blank page instead of the lost page.

## Error Recovery

The PostScript interpreter does *not* always recover cleanly from error conditions, especially errors occurring in an optional paper feeder or envelope feeder. A failure to recover is indicated in one of the following ways.

- The printer goes to the online idle state without completing the print job. If this happens, you need to send the print job again.

- The printer displays *warming up* on the LCD but does *not* return to the online condition. If this happens, you must turn off power to the printer and then turn it back on. While the power is off, it is a good idea to open the cover and check for paper jams before turning the power back on.

## Turning Off Power While Changing Consumables

If you want to change a toner cartridge, developer cartridge, or OPC cartridge while *PostScript* is the emulator, you must turn the printer power off before changing the consumable.

## Opening the Cover While Printing

You should *never* open the printer while printing a job. For safety reasons, the printer shuts down all paper movement when the cover opens, which can jam the printer.

If you open the cover while printing a PostScript job, the results are unpredictable. For this reason, it is recommended that you always turn off power to the printer before opening the cover.

# Changing Timeouts

The PostScript interpreter has three timeouts that can terminate a job if no specific activity occurs for a defined period of time. If a job times out while unprinted data is in the print buffer, that data is lost.

- *Job timeout* defines how long an individual job can operate. This prevents a program error from tying up a network. The default value is 0 (no timeout).
- *Manual feed timeout* defines how long to wait for a manual feed after the command to print a page. The default value is 60 seconds.
- *Wait timeout* defines the period of inactivity that can elapse while performing a job. The default value is 40 seconds.

You can change all three timeouts with the following PostScript command.

*job manualfeed wait* setdefaulttimeouts

If you define a time of 0 for a timeout, the printer does *not* end a job with a timeout error regardless of elapsed time.

For example, the following PostScript program changes job timeout to infinite, the manual feed timeout to 120 seconds, and the wait timeout to 30 seconds.

```
serverdict begin
0000
exitserver
statusdict begin
0 120 30 setdefaulttimeouts
end
```

To terminate the program, send a Control-D (04H) to the printer. Do *not* press the **Enter** key after sending the Control-D.

# Printing a Start Page

A PostScript start page is the same as the status report. Although the factory default for the printer is *not* to print a start page, you can change that by sending the following PostScript program to the printer.

```
serverdict begin
0000
exitserver
statusdict begin
true setdostartpage
end
```

To terminate the program, send a Control-D (04H) to the printer. Do *not* press the **Enter** key after sending the Control-D.

**Note:** To turn off the start page again, send the same program to the printer substituting false for true in the fifth line.

# 5
# Global Options for Non-Turbo Printers

## This chapter tells you about:

- Selecting the options that apply to all personal printer configurations on non-Turbo printers

## Contents

# Powerup Online

The *Powerup Online* option determines whether the printer goes online automatically at powerup or whether you need to press the **Online/Offline** switch to put it online. The default value for *Powerup Online* is *Yes*.

To change powerup online, follow these steps.

1. Press **Printer Setup**.

2. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.

3. Press ▶ **Next** until the LCD displays *Misc:Pwrup On* then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays *Yes* or *No* then press ▼ **Select**.

You have the following miscellaneous communication options.

- Buffer size
- Transmit disable
- Busy offline

## Buffer Size

The *Buffer Size* option defines the amount of memory allocated to the receive buffer, which holds information before it is processed by the printer and moved to the print buffer. A larger receive buffer does *not* decrease the processing time, but it *does* decrease the time it takes your computer to send data to the printer, allowing you to use your computer sooner.

You have the following choices for buffer size.

- 256 bytes
- 1K bytes
- 4K bytes
- 16K bytes
- 64K bytes
- 256K bytes

When selecting a buffer size, keep the following in mind.

- Select a smaller buffer size if you are using the HPII emulator with 512K bytes of memory, especially when printing large graphics or downloaded fonts, or if you are using PostScript as the emulator with 1.5M bytes of memory.
- Select a larger buffer size if the host receives a printer timeout message when trying to print and you have more than minimum memory installed in the printer.

The factory default buffer size is 1K bytes.

**Note:** Increasing the size of the receive buffer decreases the amount of memory available for the print buffer. If you need a larger receive buffer, you might also need to install additional memory boards to prevent memory errors from occurring while printing.

To change the size of the receive buffer, follow these steps.

1. Press **Printer Setup**.
2. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.
3. Press ▶ **Next** until the LCD displays *Misc:Comm* then press ▼ **Select**.
4. Press ▶ **Next** until the LCD displays *Comm:Buffer Size* then press ▼ **Select**.
5. Press ▶ **Next** until the LCD displays the buffer size you want then press ▼ **Select**.

Since the printer allocates memory to buffers only at initializations, a change to the buffer size does *not* take effect until you turn off the printer and turn it on again. At initialization if the amount of memory you request is not available, the printer assigns the largest possible amount of memory to the buffer.

## Transmit Disable

There is often a dialog between the host and the printer about the status of the printer or the status of the job. Problems can arise if the host is *not* expecting the printer to send status information. If you select *Yes* for *Transmit Disable*, the printer does *not* return status messages to the computer. The factory default value for *Transmit Disable* is *No*, that is, the printer *does* send status information when requested.

**Note:** If you have a Serial Interface or AppleTalk+RS-422+ RS-232 board installed in your printer, you should always set *Transmit Disable* to *Yes* when using the standard parallel interface to prevent hanging up the printer.

To change value of transmit disable, follow these steps.

1. Press **Printer Setup**.
2. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.
3. Press ▶ **Next** until the LCD displays *Misc:Comm* then press ▼ **Select**.
4. Press ▶ **Next** until the LCD displays *Comm:XmitDsble* then press ▼ **Select**.
5. Press ▶ **Next** until the LCD displays *Yes* or *No* then press ▼ **Select**.

## Busy Offline

The *Busy Offline* option determines whether the printer can continue to receive data while it is offline.

- If *Busy Offline* is set to *Yes*, the printer refuses data from the host while offline. This is the default value because it gives you more direct control over the operation of your printer.
- If *Busy Offline* is set to *No*, the printer accepts data into the receive buffer until it is full, signaling the host to stop sending data. Continuing to receive data while offline can be helpful, especially when you have selected manual feeding.

Regardless of whether the printer accepts data while offline, it never processes the data until you put it back online.

**Note:** If the printer goes offline because of an error, the printer always refuses data from the host regardless of the value of this option.

To change value of busy offline, follow these steps.

1. Press **Printer Setup**.
2. Press ▶ **Next** until the LCD displays *Setup:Misc* then press ▼ **Select**.
3. Press ▶ **Next** until the LCD displays *Misc:Comm* then press ▼ **Select**.
4. Press ▶ **Next** until the LCD displays *Comm:Busy Offl* then press ▼ **Select**.
5. Press ▶ **Next** until the LCD displays *Yes* or *No* then press ▼ **Select**.

# 6
# Using a Turbo Printer

## This chapter tells you about

- Using Automatic Emulator Switching
- Using concurrent communication
- Printing with PostScript Level 2

## Contents

# Features of a Turbo Printer

A regular *microLaser* printer becomes a Turbo printer by the addition of a Turbo board. A Turbo board adds a RISC PostScript processor to your printer. RISC stands for "reduced Instruction Set Computing," and this RISC processor increases the processing time of PostScript by up to 6 times that of the PostScript board in a non-Turbo *microLaser* printer.

A Turbo board does *not* increase print speed beyond rated maximum for your printer, and it does *not* affect the processing speed of any other emulator. You should notice dramatic improvements in processing time, however, whenever you print PostScript graphics.

A Turbo printer has the following features not available with non-Turbo *microLaser* printers.

- PostScript Level 2 page description language
- Automatic emulator switching (AES)
- Concurrent communication

---

**Note:** AES and concurrent communication eliminate the need for the personal printer configurations used in a non-Turbo printer. If you frequently print using the HPII emulator, you may want to use the QuickSet program included with all Turbo printers and Turbo boards. Refer to the QuickSet User's Manual that accompanies the QuickSet diskette for instructions on how to install and use the QuickSet program.

---

# PostScript Level 2 Features

PostScript Level 2 is the most current implementation of this industry-standard page-descript language. Some of the new features available only in PostScript Level 2 include the following.

- Composite fonts allowing unlimited character sets
- Dynamic memory allocation to reduce operating memory requirements
- Forms and form caching
- Patterns and pattern caching
- Color operators for increased speed when gray-scaling color graphics
- Compression/decompression filters to reduce the amount of transmitted data, especially when printing halftones

Although some of these features work with PostScript Level 1 drivers, you must have a PostScript Level 2 driver installed on your software to take full advantage of these new features. Turbo printers and the Turbo Board kit include PostScript Level 2 drivers for a Macintosh computer and for a PC running Microsoft Windows 3.0 or higher. Refer to the installation instructions accompanying the PostScript Level 2 drivers diskette to install the drivers on your computer.

**Note:** Some features, such as forms caching, require changes to application software in addition to a PostScript Level 2 driver. If you do not know whether your application software was written for PostScript Level 2, contact the software manufacturer.

# Using Automatic Emulator Switching

Automatic Emulator Switching (AES) examines incoming data to determine which emulator to use to process the data. AES primarily helps your printer work better in a multiuser environment by sensing the nature of the data being sent so the printer can process the data correctly.

AES can also be helpful even if your printer serves only one user if you switch back and forth between PostScript printing and the HPII emulator.

If you are only doing PostScript printing, you should turn off AES to eliminate the possibility that AES could switch to the HPII emulator.

The PostScript memory on the Turbo board is completely separate from the memory used by the HPII emulator. When you return to PostScript after HPII processing, the PostScript environment, including downloaded fonts and cached forms, remains intact.

**Note:** When PostScript is the emulator, the printer uses the memory on the controller board as well as the Turbo board. Consequently, the HPII environment is *not* preserved when the printer switches to PostScript processing.

When AES is in effect, the printer looks in the first 300 characters for a percent sign followed by an exclamation mark (%!).

- If the printer finds %!, the printer processes the data as a PostScript print job.
- If the printer does *not* find %!, the printer processes the data as an HPII print job.

Because of this, you need to do the following if you are using AES while printing a PostScript print job from a Windows program.

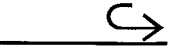
- Download the PostScript header at the beginning of each print job
- Modify the PostScript wait timeout when printing complex graphics

## Downloading the PostScript Header

By downloading the PostScript header at the beginning of each print job, you can ensure that the printer always switches to PostScript processing.

To set the Windows PostScript driver to download the header at the beginning of each print job, follow these steps.

1. Select *Control Panel* from the main Windows menu.
2. Select *Printers* from the Control Panel.
3. Highlight the PostScript printer driver from the list of installed printers and select *Configure.*
4. Select *Setup* from the Configure window.



5. Select *Options* from the Setup window.

6. Select *Download each job* from the Options window.

7. Select *OK* at each window until the Control Panel reappears, then close the Control Panel.

## Modifying the PostScript Wait Timeout

The Windows Print Manager does not begin to send a page to the printer until the entire page has printed to disk. If you are printing a complex graphic, it is possible for the PostScript wait timeout to be exceeded. When the wait timeout is exceded, the PostScript interpreter terminates the print job, and the printer once again looks for %! to determine how to process the data. Because %! is rare in the middle of a print job, the printer is likely to process the remainder of the print job in HPII mode. When this happens, the printer prints page after page of PostScript code.

If you have a problem with the printer switching to HPII mode in the middle of a PostScript print job, you need to increase the PostScript wait timeout. By sending the following PostScript program to the printer, you can increase the PostScript wait timeout to 5 minutes from the default of 40 seconds.

```
%!
serverdict begin
0000
exitserver
statusdict begin
0 60 300 setdefaulttimeouts
end
```

To terminate the program, send a Control-D (04H) to the printer. Do *not* press the **Enter** key after sending the Control-D.

# Using Concurrent Communication

Concurrent communication describes the ability of a Turbo printer to monitor several communication ports and switch to the port that is receiving data. For concurrent communication to be significant, your printer must have an optional communication board installed *and* be connected to more than one host.

## Concurrent Communication Ports

The number of ports that can be active at one time depends on the type of optional communication board installed in the printer.

- With a RS-232 board installed, there are two active ports: parallel and RS-232.
- With the AppleTalk board installed, there are also two active ports: parallel and your choice of either AppleTalk, RS-232, or RS-422.
- With a Comm+SCSI board, there are three active ports: parallel, RS-232/RS-422, and AppleTalk.

## Configuring a Port

Each port is independently configured. For example, one port could be configured for parallel communication and Automatic Emulator Switching and another could be configured for AppleTalk and PostScript. Refer to Chapter 7 for the procedure to configure a port.

## How Concurrent Communication Works

When a Turbo printer first comes online, all available ports are initialized and able to receive data. The printer scans each port for data. The first port to receive data becomes the active port.

# Using Concurrent Communication

When a port becomes active, the printer loads the configuration defined for that port and makes all other ports inactive. If the printer receives data from an inactive port, the data is stored in the receive buffer for the port. The printer does *not* process the data until the active port relinquishes control and the inactive port becomes active.

The active port relinquishes control when inactivity exceeds the designated time limit.

- For HPII and other non-PostScript emulators, this occurs when the host for the port does *not* send data for the designated port timeout.
- With PostScript printing, the port is not considered inactive until PostScript relinquishes control. This occurs at the end of a PostScript job or when a PostScript timeout is exceeded.

**Note:** You should *not* set the PostScript inactivity timeout to 0 (indefinite) if you are using concurrent communication. If a host should fail to end the PostScript job, the printer would be unable to switch to another communication port.

# Information If You Upgraded to Turbo

If you have added Turbo as an upgrade to an existing *microLaser* printer, you should be aware of the following.

- The Turbo upgrade uses only its own memory or attached memory board when running PostScript. You can still use optional memory boards attached to the controller board for downloading fonts for other emulations and for increasing the size of receive buffers.

# 7
# Configuring a Turbo Printer

## This chapter tells you about

- Defining a port
- Defining options that apply to all ports

## Contents

# Contents

# Using the Default Setup

Because of the automatic emulator switching (AES) and concurrent communication features, you can often operate a Turbo printer successfully without any setup. Refer to the following pages if you want to optimize the performance of your printer.

# Setup Overview

With a Turbo printer, you do *not* have the personal printer configurations of a non-Turbo printer. AES and concurrent communication eliminate the need for personal printer configurations. (Refer to Chapter 6 for a description of AES and concurrent communication.)

Instead of personal printer configurations, you define how a communication port performs. You only need to define the ports that you want to use; you can leave undefined any ports that you are not using.

All printers have a parallel port. The other ports you can define depend upon the communications options installed in your printer.

- With a serial interface board, you can define the RS232 port in addition to the parallel port.
- With an AppleTalk board, you can define the parallel port and either the AppleTalk or RS422/RS232 ports.
- With a Comm+SCSI board, you can define the parallel, serial (RS232/RS422), and AppleTalk ports. The SCSI port is for attaching to a hard disk and does not require definition.

In addition to defining a port, you can also define several miscellaneous options that apply to all ports.

## Defining a Port

You can define the following features of a port.

- Communication interface—By defining the communication interface, you can customize the way the port sends and receives data to maintain compaibility with the host for the port.
- Emulator—If you do not choose to use AES, you can define the emulator and some other print features that depend on the emulator.

- Options used by all emulators—Regardless of the emulator, you can select the tray and the size of the receive buffer.

- Reports—Since some reports vary by emulator and the port defines the emulator, printing a report is a function of the port.

## Defining Miscellaneous Options

You can also define the following miscellaneous options that apply to all ports.

- Auto continue—when enabled, allows the printer to recover from some error conditions without user intervention

- Powerup online—when enabled, allows the printer to receive data immediately upon completion of powerup self test

- Port timeout—determines how long an inactive host can prevent another host from accessing the printer

# Defining the Communication Interface

When you define the communication interface for a port, you must make sure that the your definition matches the requirements of the host for that port. An improperly defined communication interface does not function well and can tie up the printer.

The following table shows your options while defining the communication interface if a Comm+SCSI board is installed.

**Note:** If you have an AppleTalk board instead of a Comm+SCSI board, you must choose which serial port is active before defining the options for that port. The default for an AppleTalk board is AppleTalk. If you change from AppleTalk to serial or from serial to AppleTalk, the printer reinitializes itself, displaying the message *Reboot→* followed by the selected interface.

**Communication Interface Options**

| Port | Option | Value | Comments |
|---|---|---|---|
| Parallel | **Std Parallel** | | |
| | Bi-Parallel | | Requires special driver on host |
| Serial (RS232/ (RS422) | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 | |
| | Data bits | 7,**8** | |
| | Stop bits | **1**,2 | |
| | Parity | Odd, Even, Mark, Space, **None** | |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), DTR (high or low) | For RS422 always use Xon/Xoff |
| AppleTalk | No options | | |

## Parallel Port

The parallel port has two options.

- *StdParallel* is a Centronics-type parallel interface. You should always choose *StdParallel* unless you know your host is equipped with a special bi-parallel interface.

- *Bi-Parallel* is an interface that allows the printer to send status information to the host through the parallel port. The host must be specially configured to support this interface.

## Serial Port

The serial port can be used by either RS232 or RS422 serial interfaces. You can define two kinds of options—data options and flow control options.

### Data Options

The baud, data bits, stop bits, and parity options define what the printer should consider as a data character. The values for these options must match the host exactly; otherwise, the data is garbled. The default values work in many computer installations. If these do *not* work for you, determine the values being used by your host and change the values.

### Flow Control Options

The flow control options define how the printer and computer tell each other they are busy.

- Xon/Xoff is a method where the printer and computer send each other control characters to indicate ready and busy states. It is the only method you can use for RS422 communication.

When you select Xon/Xoff, you can choose whether to use robust Xon. With robust Xon the printer sends the Xon character once a second until the host resumes data transmission. Although robust Xon is usually beneficial, some hosts cannot handle the repeated Xon character. If you experience unexplained problems while communicating with the host using robust Xon, try turning off robust Xon.

- DTR (Data-Terminal-Ready) is a line in the standard RS-232 cable. The printer can turn this line high or low to indicate it is busy.

**Note:** If your serial flow control uses pin 11 to indicate busy state, you can change the configuration of the Comm+SCSI board so that DTR detects the status of Pin 11. Refer to the installation instructions for the Comm+SCSI board for the procedure to change the jumper.

## AppleTalk Port

The AppleTalk port has no communication options.

The emulator defined how the printer interprets data from the host. After selecting the emulator, you can usually define some default values for the emulator.

The following table shows your setup options for defining the emulator.

**Emulator Options**

| Emulator | Option | Value | Comments |
|---|---|---|---|
| **AES** | None | | |
| PostScript | PSCOMM | Standard | For printing only PostScript files in a single-user environment |
| | | **TINet** | For switching emulators with global commands, especially in a multi-user environment |
| | | Binary | For sending binary data to the PostScript interpreter |
| HPII | Font | Typeface | Depends upon fonts currently in printer: resident, font cards, downloaded |
| | | Pitch/Point Size | Depends on typeface |
| | | Symbol Set | Depends on typeface |
| | Orientation | **Portrait**, Landscape | |
| | Copies | **1** to 99 | |
| | Page Length | 5 to 128 | Calculates line spacing based on current paper tray |
| Hex Dump | None | | |

# Defining the Emulator

Follow these steps to define the emulator for a port.

**Note:** You cannot define the emulator for the AppleTalk port. The AppleTalk port can receive only PostScript data.

1. Press **Printer/Setup**.

2. Press ▶ **Next** until the LCD displays *Setup:Ports*, then press ▼ **Select**.

3. Press ▶ **Next** until the LCD displays the name of the por you want to define (for example, *Ports:Parallel*), then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays the port followed by Def (for example, *Parallel:Def*), then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays *Emulator*, then press ▼ **Select**.

6. Press ▶ **Next** until the LCD displays the name of the emulator you want, then press ▼ **Select**.

7. If the emulator you select has any options, you can define them or press **Online/Offline** to save the configuration of the port.

# Selecting AES as the Emulator

If you expect to use the port for both PostScript and HPII print jobs, you should select AES as the emulator. If you expect to use the port for only one type of printing, select the specific emulator that applies.

If you select AES as the emulator after defining another emulator, the following happens.

- The printer retains all of the definitions for the HPII emulator, including form length, font, orientation, and copies. These are used when AES switches to the HPII emulator and ignored when AES switches to the PostScript interpreter.
- The printer sets the PSCOMM option to TINet regardless of the previous definition. This definition remains in effect until you change it.

**Note:** When AES is the active emulator, you can change all of the HPII options except of form length. To change the form length, you must select HPII as the emulator, change the form length, then select AES as the emulator

# Selecting PostScript as the Emulator

If you plan to use a port exclusively for PostScript printing, select *PostScript* as the emulator. After selecting PostScript, you can select one of the following PostScript communication (PSCOMM) options.

**Note:** To change the PostScript communication protocol, the printer must be offline when you press **Printer Setup**.

- Standard—the most common protocol on PostScript printers; the protocol to choose if you usually print only PostScript files and your printer serves only one workstation

- Binary—a protocol developed by Adobe Systems that, among other features, allows you to transmit binary data to the PostScript interpreter

- TINet—a protocol developed by Texas Instruments that allows you to switch printer emulations reliably without loss of data; the protocol to choose if you plan to switch between emulations using software commands, especially in a multiuser environment; the protocol always used by AES

If you plan to use a port exclusively for non-PostScript printing, select HPII as the emulator. If you are using application software that has a printer driver for the HP LaserJet or HP LaserJet Series II, you can probably ignore the HPII setup options. If you are using software that does not have such a driver, you can use the Font, Orientation, and Page Length options to define how you want the printer to print data.

## Using the Default HPII Configuration

The HPII emulator has the following default values.

| | |
|---|---|
| Tray | Tray1 |
| Orientation | Portrait |
| Form Length | 60 |
| Font | Courier, 10-pitch, PC-8 |

If these are the values you want to use, or if you are using application software that configures the printer for you, then you do not need to change the settings. Use the procedures on the following pages to create a custom port configuration.

## Changing the HPII Font

A font is a pattern of characters the printer uses to represent data received from the host. The font is determined by the typeface, pitch/point size, and symbol set.

Follow these steps to change the font.

1. Make sure the port you want to define is the current port and that HPII or AES is the current emulator. If you need to change ports or emulators, follow the procedure "Defining the Emulator" in this chapter.

2. Press **Online/Offline** so that the LCD displays *Offline.*

3. Press **Font**. The LCD displays *Font:Typeface.*

4. Press ▼ **Select**.

5. Press ▶ **Next** until the name typeface you want to select appears on the LCD then press ▼ **Select**.

6. Press ▲ **Up** then ▶ **Next**. The LCD displays *Font:Pitch/Point*.

7. Press ▼ **Select**.

8. Press ▶ **Next** until the pitch or point size you want appears on the LCD then press ▼ **Select**.

9. Press ▲ **Up** then ▶ **Next**. The LCD displays *Font:SymSet*.

10. Press ▼ **Select**.

11. Press ▶ **Next** until the symbol set you want to select appears on the LCD then press ▼ **Select**. For most PC applications the symbol set should be the default, PC-8. For some applications written specifically for the HP LaserJet printer, the symbol set should be ROMAN-8. For international and other specialized needs, select one of the symbol sets shown in Appendix C.

12. Press **Online/Offline**.

## Changing the Orientation

Follow these steps to change the orientation.

1. Make sure the port you want to define is the current port and that HPII or AES is the current emulator. If you need to change ports or emulators, follow the procedure "Defining the Emulator" in this chapter.

2. Press **Portrait/Land**.

3. Press ▶ **Next** until the orientation you want to select appears on the LCD then press ▼ **Select**.

## Changing the Form Length

The *Form Length* value establishes the line spacing to use with the HPII emulator. The printer calculates the line spacing based on the following.

- Number of lines per page
- Size of the currently installed paper tray in the selected paper tray slot (if *Manual* is selected, the printer uses Letter size)

For example, the standard line spacing is six lines per inch, which yields 60 lines on a letter-size page. (Six lines are lost due to top and bottom margins.) If you load legal paper, the printer keeps the six lines per inch spacing, which yields 78 lines per legal-size page.

If you set a form length of 66 lines on a letter-size page (instead of the standard 60), the printer compresses the distance between each line so that you are actually printing 6.6 lines per inch. Although you can set the number of lines per page between 5 and 128, you should make sure that your font size is appropriate to the line spacing. More lines per page require smaller characters for maximum readability.

The printer calculates line spacing during setup using the current paper tray for the selected paper tray (letter-size if manual is selected). Make sure you have the correct paper tray installed when you define the configuration for a port.

Follow these steps to change the form length.

1. Press **Printer Setup.**
2. Press ▶ **Next** until the LCD displays *Setup:Ports*, then press ▼ **Select**.

3. Press ▶ **Next** until the LCD displays the name of the port you want to define (for example, *Ports:Parallel*), then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays the port followed by *Def* (for example, *Parallel:Def*), then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays *Emulator*, then press ▼ **Select**.

6. Press ▶ **Next** until the LCD displays *HPII*.

7. Press ▼ **Select**. The LCD displays the current form length (lines per page).

   - Press ▶ **Next** to increase the number of lines per page.

   - Press ◀ **Previous** to decrease the number of lines per page.

8. When the correct number appears on the LCD, press ▼ **Select**.

## Changing the Number of Copies

If you need to print more than one copy of an original, it is often more efficient to set the printer to print multiple copies per page than it is to send the data multiple times to the printer. When you select multiple copies, the printed pages for multipage documents are not collated. The savings in printing time and your time are usually worth the effort to collate the pages manually after printing.

Follow these steps to change the number of copies to print.

1. Make sure the port you want to define is the current port and that HPII or AES is the current emulator. If you need to change ports or emulators, follow the procedure "Defining the Emulator" in this chapter.

2. Press **Printer Setup.**

3. Press ▶ **Next** until the LCD displays *Setup:Ports*, then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays the name of the port you want to define (for example, *Ports:Parallel*), then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays the port followed by *Def* (for example, *Parallel:Def*), then press ▼ **Select**.

6. Press ▶ **Next** until the LCD displays *Copies*.

7. Press ▼ **Select**. The LCD displays the current number of copies.

   - Press ▶ **Next** to increase the number of copies (up to 99).

   - Press ◀ **Previous** to decrease the number of copies.

8. When the correct number appears on the LCD, press ▼ **Select**.

# Selecting Hex Dump as the Emulator

When you select the hex dump emulator, the printer prints the hexadecimal values of all received characters instead of interpreting those values. By using the hex dump emulator, you can see exactly what the host is sending the printer. This can be useful if you need to diagnose an incompatibility between the host and the printer.

The following is an example of output produced by the hex dump emulator.

```
0000  1B 29 38 55 1B 29 73 30   50 1B 29 73 31 30 68 31   .)8u.)s0  P.)s10h1
0010  32 56 1B 29 73 30 73 30   62 33 54 0E 1B 2A 70 30   2V.)s0s0  b3T..*p0
0020  30 38 35 59 1B 2A 70 30   33 30 30 58 1B 26 70 31   085Y.*p0  300X.&p1
0030  58 30 20 1B 2A 70 30 34   32 35 58 1B 26 70 31 58   x0 .*p04  25X.&p1x
0040  31 20 1B 2A 70 30 35 35   30 58 1B 26 70 31 58 32   1 .*p055  0X.&p1X2
0050  20 1B 2A 70 30 36 37 35   58 1B 26 70 31 58 33 20    .*p0675  X.&p1X3
0060  1B 2A 70 30 38 30 30 58   1B 26 70 31 58 34 20 1B   .*p0800X  .&p1X4 .
0070  2A 70 30 39 32 35 58 1B   26 70 31 58 35 20 1B 2A   *p0925X.  &p1X5 .*
0080  70 31 30 35 30 58 1B 26   70 31 58 36 20 1B 2A 70   p1050X.&  p1X6 .*p
0090  1B 29 38 55 1B 29 73 30   50 1B 29 73 31 30 68 31   .)8u.)s0  P.)s10h1
0100  32 56 1B 29 73 30 73 30   62 33 54 0E 1B 2A 70 30   2V.)s0s0  b3T..*p0
```

**Note:** When hex dump is the active emulator, the printer disables concurrent communication. To restore the printer to normal printing, you must change the emulator or the active port through the control panel.

# Changing Communication Options

The printer has the following communication choices.

- *StdParallel*—Centronics-type parallel interface
- *Bi-Parallel*—a parallel interface that allows the printer to send status information to the host if the host supports this interface
- *RS232*—requires any optional communication board
- *RS422*—requires an optional AppleTalk+RS-422+ RS-232 Board or a Comm+SCSI board

If you select one of the optional serial interfaces, you have additional communications values to define as shown in the following table. (The default values are shown in bold)

| Port | Option | Value |
|---|---|---|
| RS232 | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 |
| | Data bits | 7,**8** |
| | Stop bits | **1**,2 |
| | Parity | Odd, Even, Mark, Space, **None** |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), DTR (high or low), Pin 11 (high or low), ETX/ACK |
| RS422 | Baud (in bits per second) | 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600 |
| | Data bits | 7,**8** |
| | Stop bits | **1**,2 |
| | Parity | Odd, Even, Mark, Space, **None** |
| | Flow Control | **Xon/Xoff** (Robust **on** or off), ETX/ACK |

# Changing Communication Options

If you are using either of the serial communications, follow these steps to select communications options.

1. Press **Online/Offine** until the LCD displays *Offline*.

2. Press **Printer Setup**.

3. Press ▶ **Next** until the LCD displays *Setup:Ports*, then press ▼ **Select**.

4. Press ▶ **Next** until the LCD displays the name of the port you want to define (for example, *Ports:Parallel*), then press ▼ **Select**.

5. Press ▶ **Next** until the LCD displays the port followed by *Config* (for example, *Parallel:Config*), then press ▼ **Select**.

6. Press ▶ **Next** until the LCD displays the option you want to change then press ▼ **Select**.

7. Press ▶ **Next** until the LCD displays the value you want to select then press ▼ **Select**.

8. If you want to change other communcation options, press ▲ **Up** and repeat steps 6 and 7.

9. Press **Online/Offline**.

# Options That Apply to All Emulators

You can define the following options for a port regardless of the emulator.

## Tray

Tray defines the default paper source for the port.

- Tray 1—the standard paper tray
- Manual—for nonstandard stock, such as envelopes, card stock, transparencies, and adhesive labels
- Tray 2—the optional paper feeder, if installed
- Limitless—if the optional paper feeder is installed
- Envelope—the optional envelope feeder, if installed

**Note:** You can change the tray setting without going through the full setup procedure by pressing **Tray**.

## Buffer Size

The *Buffer Size* option defines the amount of memory allocated to the receive buffer for the port. The receive buffer holds information before it is processed by the printer and moved to the print buffer. A larger receive buffer does *not* decrease the processing time, but it *does* decrease the time it takes your computer to send data to the printer, allowing you to use your computer sooner.

Increasing the size of the receive buffer decreases the amount of memory available for the print buffer. If you need a larger receive buffer, you might also need to install additional memory boards to prevent memory errors from occurring while printing.

Since the printer allocates memory to buffers only at initialization, a change to the buffer size does *not* take effect until you turn off the printer and turn it on again. At initialization if the amount of memory you request is not available, the printer assigns the largest possible amount of memory to the buffer.

If your printer has an optional serial board but only 512 K bytes of system memory, you cannot allocate 256 K bytes to both receive buffers. The maximum receive buffers in this circumstance is either 256 K bytes for one buffer and 16 K bytes for the other buffer or 64 K bytes for both buffers.

**Note:** If you allocate 256 K bytes to two buffers when the printer has only 512 K bytes of system memory, the printer locks up during initialization. If this happens, reset system memory as described in Chapter 10 to return the system to its factory defaults.

## Printing Reports

Most reports show information specific to the current emulator. Since the current emulator for a Turbo printer is determined by the configuration of the current port, you print a report as an option of a port. Refer to Chapter 9 for how to interpret reports.

## Auto Continue

The value of the *Auto Continue* option determines how the printer responds to some conditions that halt printing.

- When *Auto Continue* is on, the printer waits approximately 10 seconds after halting printing. If you do *not* take any action within that time, the printer resumes as if you had pressed **Continue/Reset**.
- When *Auto Continue* is off, the printer waits for you to press **Continue/Reset** before continuing.

*Auto Continue* affects the following situations.

- Memory errors
- Communication errors
- Paper-size errors (In this case the printer feeds from the standard paper tray if you do *not* manually feed a page within 10 seconds.)

If you are using the printer remotely, turning *Auto Continue* on avoids tying up the printer indefinitely. If the printer is next to you on your desk, turning *Auto Continue* off gives you greater control over the printer's operation.

The factory default value for *Auto Continue* is *Off*.

## Powerup Online

The *Powerup Online* option determines whether the printer goes online automatically at powerup or whether you need to press **Online/Offline** to put it online. The default value for *Powerup Online* is *On*.

## Port Timeout

The *Port Timeout* option defines how long the printer allows an inactive communication port to tie up the printer before allowing other ports to print. You can set the *Port Timeout* option from 1 to 60 seconds. The factory default is 5 seconds.

- To increase the time, press ▶ **Next.**
- To decrease the time, press ◀ **Previous.**

---

**Note:** When doing PostScript printing, the printer does *not* consider a port to be inactive until after PostScript relinquishes control. This occurs at the end of a job or following a PostScript inactivity timeout. In the latter case, the port must be inactive the length of the PostScript inactivity timeout plus the port timeout before another channel can become active. For this reason, you should *not* disable the PostScript inactivity timeout (by setting its value to zero) if you are using concurrent communication.

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# 8
# Handling Paper

## This chapter tells you about

- Selecting the best papers for your printer
- Loading paper
- Choosing a paper path
- Manually feeding paper
- Clearing paper jams

## Contents



# Contents

# Choosing Paper for Printing

For the best printing quality, you should purchase papers specifically formulated for laser printing. For rough drafts you can also use photocopy papers made for xerographic copiers. Xerox® 4024 and 4200 and Canon® NP papers print satisfactorily.

Some cotton bond papers for high-quality letterheads are made especially for laser printing. Ask your printing vendor to print your letterheads and other forms on these laser-compatible papers.

Avoid papers with cockle, laid, or woven finish or other rough papers. Smooth, hard-surface papers accept toner best. Textured papers do *not* print well in any laser printer.

Appendix A of this manual lists the weights, sizes, and other specifications for single sheets, envelopes, labels, and overhead projector films you can use in the printer.

**Note:** To print on legal paper with the PostScript option, your printer must have at least 2.5 megabytes of memory installed.

# Paper-Loading Guidelines

## Guidelines for All Printers

When you load a paper tray, follow these guidelines.

- **Use clean, dry, flat sheets.** *Never* use paper that is creased, wrinkled, damp, stapled, or warped. Leave unused paper in the package, which helps to keep the paper flat and reduce wrinkling and bending.

- **Do not fan paper before inserting it into a paper tray.** Fanning the paper is *not* necessary and can introduce air between sheets of paper, which increases the possibility of a misfeed.

- **Do not overfill.** Make sure the paper is under the corner tabs, uniformly stacked in the tray, and below the fill line on the side of the paper tray.

- **Load the tray with paper that matches the size marked on the front of the tray**, for example, **Letter (Letter/Legal** on the *microLaser XL*) or **A4**.

- **Load paper in the tray with printing surface facing *down*.** Most package labels for laser paper show which is the printing surface.

- **Feed heavy or special stock manually.** Special materials, such as transparency film and labels, are best fed manually.

- **Use limitless mode with an optional paper feeder.** In limitless mode the printer feeds from the optional paper feeder as long as it has paper. When the optional paper feeder is empty, the printer feeds from the standard paper tray. You can load paper in the optional paper tray while the printer is printing from the standard paper tray without stopping the printer.

## Special Guidelines for Loading Paper in a microLaser XL Printer

If you have a *microLaser XL* printer, follow these additional guidelines when loading paper.

### Tips for Using the Standard XL Paper Tray

- **Place paper into a tray in a single stack.** Place about half of a ream (250 sheets) of 20-lb (75 $g/m^2$) paper into the tray.

- **Never add paper to a partially filled tray.** The printer stops when it is out of paper, allowing you to fill the tray and resume printing without loss of data. Adding paper on top of paper in the standard paper tray can cause a multifeed. *A multifeed usually results only in unprinted pages, although it can cause a paper jam.*

- **Underfill a standard tray when printing on some 24-lb paper.** Some types of 24-lb paper feed do *not* feed well. If the paper you are using does *not* feed properly, you can usually improve its performance by reducing the amount of paper in the paper tray. By filling the standard tray only 2⁄3 full (approximately 150 sheets), you can usually eliminate most feeding errors.

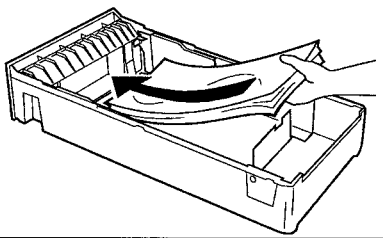
### Tips for Using an Optional XL Paper Feeder

- **Remove adhesive residue from the pressure plate on the paper tray.** The tape used to pack the paper tray can leave adhesive on the pressure plate. This adhesive makes it more difficult to insert paper without damaging the bottom pages. To remove adhesive from the pressure plate, use a clean, soft cloth moistened with isopropyl (rubbing) alcohol.

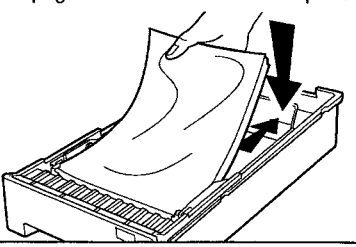
# Paper-Loading Guidelines

- **Load paper into the paper tray in 2 or 3 separate stacks.** Although the paper tray in an optional paper feeder can hold a ream (500 sheets) of 20-lb (75 $g/m^2$), it is difficult to load an entire ream without damaging the bottom pages.

**a.** Insert the front of a stack under the corner tabs.



**b.** Lower the stack inside the back plate. Do *not* damage the bottom pages of a stack on the back plate.



Each printer comes with a paper tray that holds the most commonly required size of paper.

- Printers shipped to the U.S. and Canada are equipped with a letter-size tray; the *microLaser XL* printer has a tray that holds either letter or legal sizes

- Printers shipped to the rest of the world are equipped to handle A4-size paper.

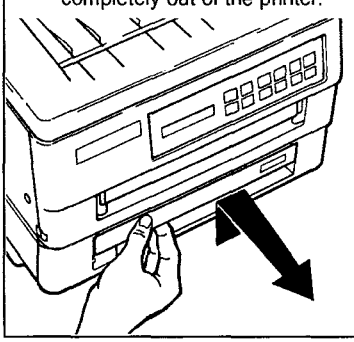
Optional size trays are available. See Appendix B for the options and ordering information.

When the paper tray becomes empty, the **Error** indicator lights, the Online indicator immediately above the **Online/Offline** switch turns off, and the LCD displays the message *Paper Out*. To restore the printer to service following a *Paper Out* message, you should reload the paper tray or insert a page in the manual feed slot.

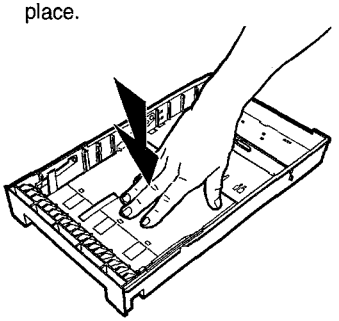
To load the standard paper tray, follow these steps.

**Note:** The following procedure shows a *microLaser Plus* printer but applies equally well to a *microLaser XL* printer.

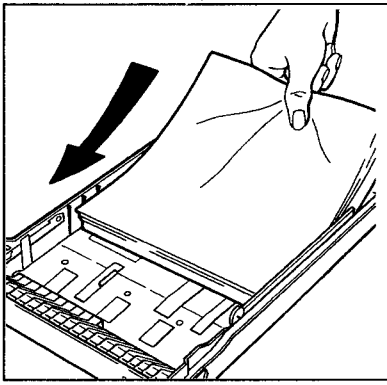
**a.** Lift up the paper tray and pull it completely out of the printer.



**b.** Press down on the spring-loaded pressure plate until it latches into place.



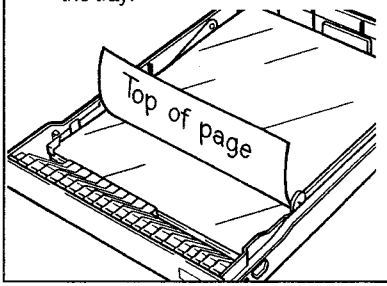
# Loading Paper



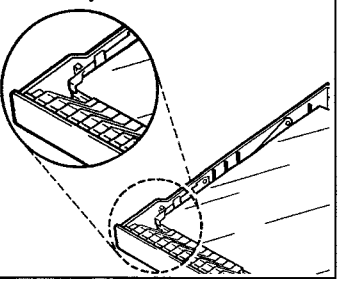
**c.** Place the paper—printing side down—into the paper tray.

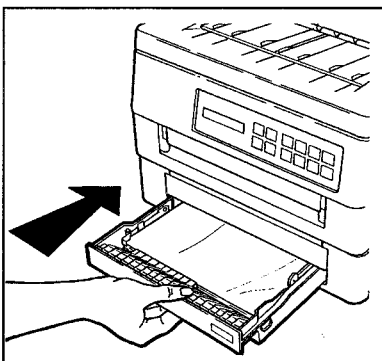
**Note:** Do *not* fan the paper before placing it in the paper tray.

**d.** If you are using letterhead, place the top of the paper face down against the front (label end) of the tray.




**e.** Make sure the paper fits under the two metal corner tabs. Remove some sheets if necessary.





**f.** Slide the loaded paper tray back into the printer until it drops into place. The printer turns off the **Error** indicator and goes back online.

**g.** You can now resume printing.

# Printing on Legal-Size Paper

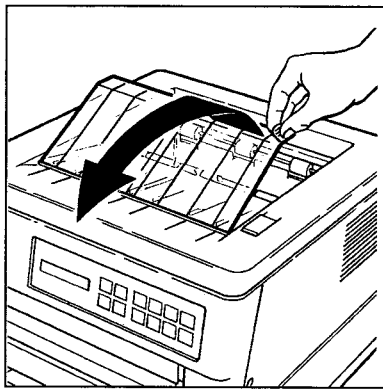
The 14-inch length of legal-size paper creates special challenges for printers. Each printer has features to optimize printing on legal-size paper.

**Note:** To print a legal-size page on a non-Turbo, PostScript printer, you must have at least 2.5 megabytes of memory (two optional 1 MB memory boards).

## microLaser Plus

To print on legal-size paper with a *microLaser Plus* printer, you need to do the following.

- Use a legal-size paper tray. The legal-size paper tray protrudes out of the back of the printer about three inches. Be sure to leave sufficient room behind the printer to accommodate the tray. If you do *not* have a legal-size paper tray, use the manual feed slot.
- Fold out the tray extension as shown in the following illustration.



**a.** Fold out the tray extension for legal-size paper.

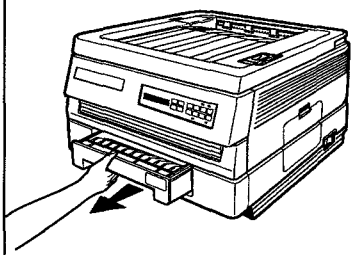
**b.** Return the tray extension to the closed position for standard paper.

# Printing on Legal-Size Paper

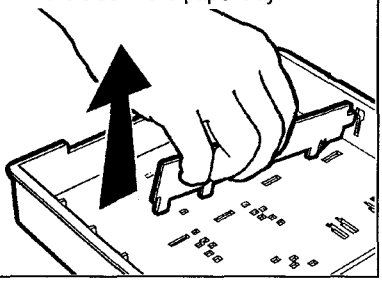
## microLaser XL

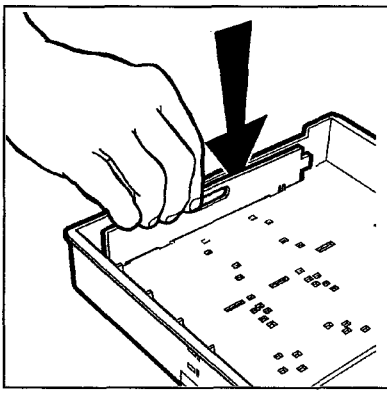
The *microLaser XL* printer has a tray that can hold either letter-size or legal-size paper. To print on legal-size paper, you must convert the tray to hold legal-size paper as shown in the following steps.

**a.** Pull the paper tray completely out of the printer. Remove any paper in the paper tray.



**b.** Remove the plastic divider by lifting the inside end and sliding the outside end from the notch on the side of the paper tray.





**c.** Insert the plastic diivider into the corresponding holes at the back of the paper tray.

**d.** Reload the paper tray with legal-size paper.

**e.** Slide the loaded paper tray back into the printer until it drops into place.

Reverse this procedure to convert the **Letter/Legal** tray back to letter-size paper.

The printer can eject printed pages in two different ways, depending on the paper path you select.

- Collated (page one at the top of the stack), printed side down to the top paper output tray. Use the top output tray for standard weight papers.

- Uncollated (page one at the bottom of the stack), printed side up to the rear output tray. Use the rear output tray for manual feeding of heavier weight stock. When used with the manual feed slot, the rear output tray provides a straight paper path.

## Top Output Tray

Use the top output tray for standard weight stock (16 to 24 lbs; 60 to 90 $g/m^2$) that you want collated. Empty the top output tray when approximately 250 sheets are printed or every time you reload the standard paper tray.

To select the top output tray, close the rear output tray. All printed sheets then feed to the top output tray.

## Rear Output Tray

You should use the rear output tray when you manually feed stiff or thick stock (up to 36 lbs; 135 $g/m^2$), such as pressure-sensitive labels, overhead transparencies, card stock, and envelopes.

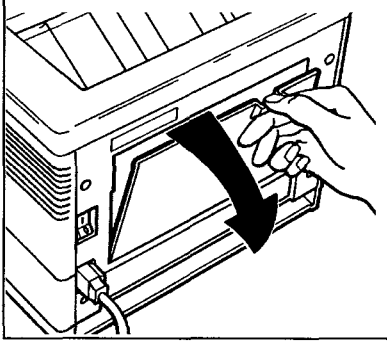
To select the rear output tray, open the rear tray and fold out the tray extension.

Empty the rear output tray when approximately 30 sheets are printed.

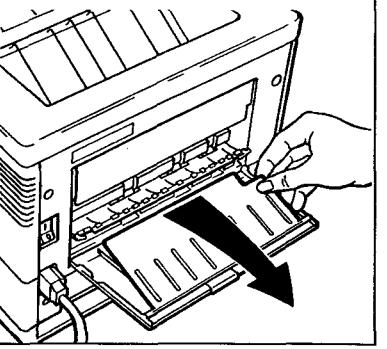
# Selecting the Paper Path

**Note:** The following illustrations show the *microLaser Plus* printer, but they apply equally well to the *microLaser XL* printer.

**a.** Pull open rear output tray.



**b.** Fold out rear tray extension.



# Using the Manual Feed Slot

You should use the manual feed slot for the following applications.

- Printing a small number of odd sheets, such as a different color, size, or weight of paper, without having to reload the paper tray
- Printing on stock heavier than the paper tray accepts (24 to 36 lbs [90 to 135 $g/m^2$])
- Printing envelopes (if your printer does *not* have an envelope feeder installed)
- Printing overhead transparencies or labels

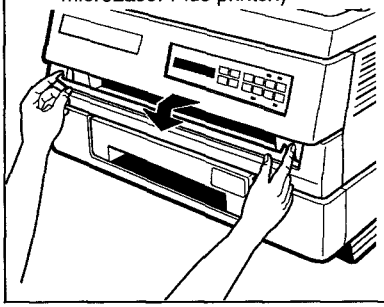
The printer feeds a page that is loaded into the manual feed slot, regardless of the current tray setting. This allows you to print on special paper without changing the selected tray to manual. Since the printer prefeeds pages to maintain a high print speed, you can only use the manual feed slot this way for the first page in a print job.

**Note:** When using the manual feed slot to override the current tray, the printer uses the same image size as the current tray.

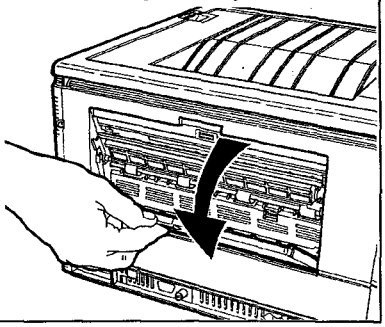
To use the manual feed slot, follow these steps. The following illustrations show the *microLaser XL* printer, but except as noted, they apply equally well to the *microLaser Plus* printer.

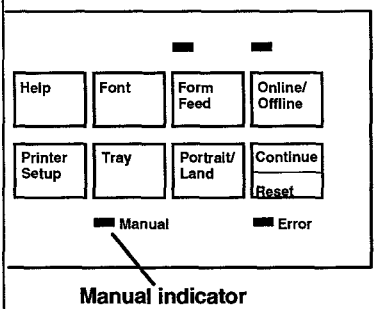
# Using the Manual Feed Slot

**a.** Fold down the manual feed slot cover. (Not needed on the *microLaser Plus* printer.)



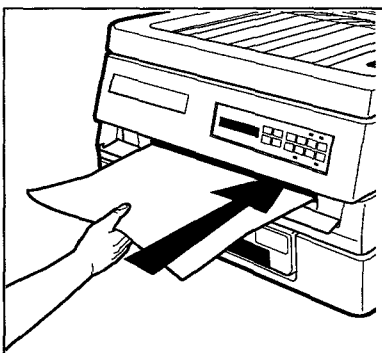
**b.** Extend the rear output tray if you are printing on heavy stock.






**c.** Press **Tray** and select *Manual*.

**d.** Print as usual. When the printer is ready to print a page, the **Manual** indicator lights.



**e.** Insert a single sheet—printing side up and top of page first—into the manual feed slot, keeping it against the left side of the slot.

**f.** Slide the paper into the slot until you feel a slight resistance as the rollers grasp the paper and pull the paper into the printer.

# Printing Envelopes

The printer can print on most business envelopes using the manual feed slot and rear output tray (see Appendix A for envelope specifications). Printing on envelopes is similar to ordinary printing, but you should follow these guidelines for best results.

If you frequently print envelopes, you may want to add an envelope feeder to your printer. The envelope feeder is more reliable than manual feeding and can hold up to 40 envelopes (70 on the *microLaser XL* printer).

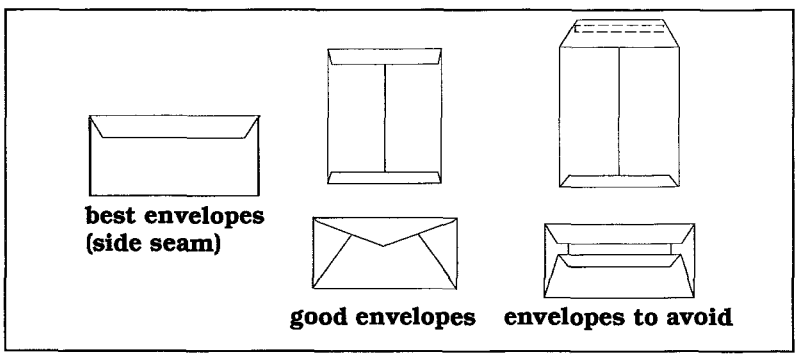
## Envelope Thickness and Texture

For best printing quality, use envelopes made from 24-lb paper with a smooth finish and sharply creased edges. An envelope is folded and glued, so its thickness in some areas can be more than four times that of the paper from which it is made. An envelope that is too thick can cause uneven print density or smudges. Problems related to thickness are compounded by a textured paper.

## Envelope Construction

You should avoid envelopes with multiple flaps or peel-off strips. These kinds of envelopes are likely to jam.

**Caution: Envelopes made with clasps, snaps, windows, or synthetic material can damage the printer.**

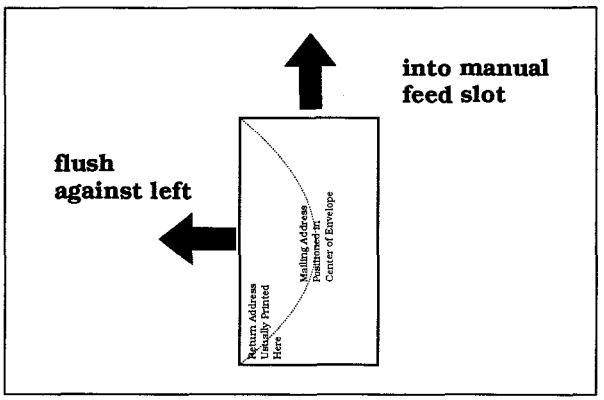


# Printing Envelopes

## Envelope Positioning

Insert the envelope into the manual feed slot using the following positioning.

- Printing side up
- Top of the envelope against the left guide edge




The direction of printing in landscape orientation depends on the software you are using. If your software prints in the opposite direction from the one shown, reverse the position of the envelope.

**Note:** The PostScript interpreter rotates the image 180 degrees when printing to an optional envelope feeder. If you have created a file to print envelopes using the manual feed slot, you must change the file or the orientation of the envelope when you print using an envelope feeder.

## Print Positioning

Select landscape orientation and set up your application program to print as close to the center of the envelope as possible. Avoid printing on envelope seams or within 1/4 inch of the edges.

**Note:** The envelope feeds against the left guide edge instead of down the center as on some other printers. You may need to change files created to print on center-feed printers. To change the files, adjust the left margin on the envelope to move the image to the left.

## Print Image

For the sharpest images, use character sizes 12 points (10 pitch) and smaller. Larger characters, boldface, and graphics tend to degrade when printed on thick, uneven envelope stock.

## Selecting Envelopes for the microLaser XL

The criteria for selecting envelopes for the *microLaser XL* printer are more stringent than for the *microLaser Plus* printer. Although many enevlopes can work well with the *microLaser XL* printer, the following envelope has been tested and found to be compatible.

Nationwide Papers
Compat®Sub 24 White Wove Side Seam
No. 126971

If you cannot find this envelope, you should look for envelopes with the following characteristics.

- Side-seam construction
- 24-lb paper with a hard, smooth surface
- Tight creases at all folds

Before ordering large quantities of envelopes for printing on any laser printer, you should test a small quantity to ensure they are compatible with the printer.

# Printing Transparencies

Follow these guidelines when using the printer to print transparencies.

- Use the manual feed slot to feed transparency film. Transparency film is likely to jam in the printer if you feed it from a paper tray.

- Use transparency film made for laser printers. Do *not* use thermal film designed to transfer the image from a photocopy. Transparencies from 3M, No. SP2500, have been tested and found compatible with the printer.

- Have the transparency film exit through the rear output tray. Transparency film can jam when exiting through the top output tray.

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**Note:** Transparency film with an attached paper backing produces the highest quality transparencies. If you experience print quality problems when printing on plain transparency film, try placing the blank transparency film on top of a sheet of copier paper and feeding the film and paper together through the printer. If print quality problems persist, use only transparency film with an attached paper backing.

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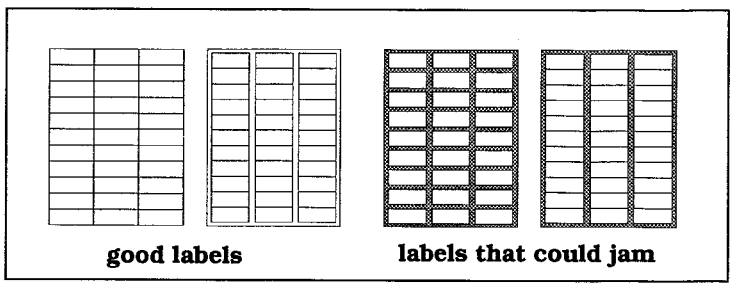
Label stock includes a top or face sheet coated with adhesive and a base sheet, which is also called the liner, backing, or carrier sheet.

Follow these guidelines when printing on labels.

- Use the manual feed slot and rear paper tray to feed labels. Labels can peel off in the printer when fed from a paper tray or exited through the top output tray.
- Use labels made for laser printers or copiers.
- The top sheet should be a hard, smooth paper similar to standard xerographics paper.
- The base sheet should be coated (usually with silicone) for easy release of the face sheet and adhesive.
- The top sheet should cover the base sheet from edge to edge with no spaces between individual labels.




- Perforations should *not* extend through the base sheet.

**Caution: Adhesive that comes in contact with any part of the printer can damage the OPC cartridge or developer and/or require extensive cleaning. No adhesive should be pressed out the edges or between the labels.**

# Clearing Paper Jams

Paper may occasionaly feed incorrectly through the printer. When a paper jam occurs, the control panel LCD alternately displays the messages *Clear Paper Jam* and *Hit Reset.*

**Note:** When the printer is doing a PostScript print job, the *Hit Reset* message does *not* appear.

When a paper jam occurs, check the following areas for the jammed paper.

- Paper tray
- Fuser unit
- Paper roller assembly

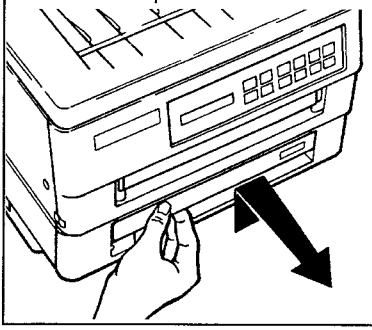
The procedures on the following pages show how to clear these paper jams.

**Note:** If you experience frequent paper jams, the problem is likely in your paper and *not* in your printer. As a control, try printing with standard 20-lb (75 $g/m^2$) copier paper. If the printer prints correctly with copier paper, ensure the other paper falls within the specifications detailed in Appendix A. If the paper meets the specifications, verify it has been stored flat and away from humidity.

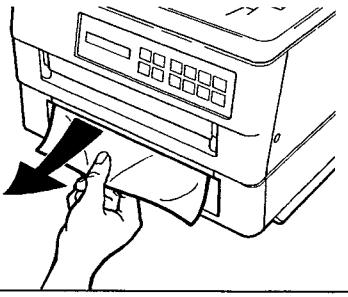
# Clearing a Paper Tray Jam

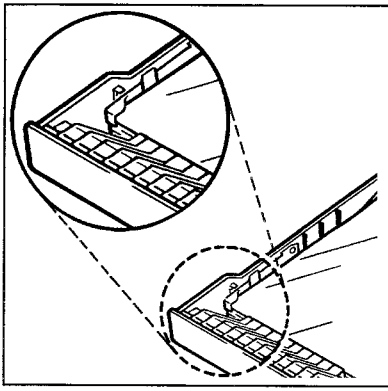
The first area to look for paper jams is the paper tray. Clear a paper tray jam as follows. Although these illustrations show the *microLaser Plus* printer, they apply equally well to the *microLaser XL* printer.

**a.** Pull the paper tray completely out of the printer.



**b.** Check the paper tray and the paper tray cavity. Carefully remove any loose paper.





**c.** Make sure the paper fits under the two metal corner tabs. Remove some sheets if necessary.

**d.** Reinsert the paper tray into the printer.

**e.** Press **Continue/Reset** to resume printing.

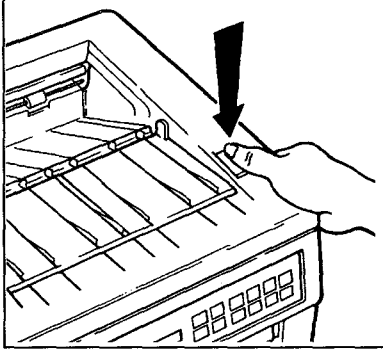
**Note:** If the paper does *not* slide out easily when you attempt to remove it, it is probably caught under the fuser. Follow the instructions for clearing a fuser unit jam.

# Clearing a Fuser Unit Jam

If you did not find loose paper in the input paper tray, check the fuser unit for jams as follows.

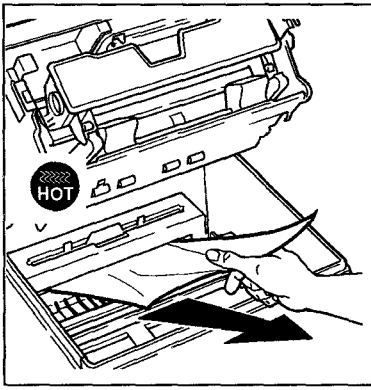
## microLaser Plus

**WARNING: The fuser reaches temperatures as high as 365° F (185° C). To avoid burning your hands, allow the fuser to cool at least five minutes before removing the jammed paper.**



**a.** Press the upper unit release button. Swing the upper unit up about 45 degrees until it stops.

**b.** If the paper is jammed in the fuser unit, wait at least five minutes for the fuser to cool.



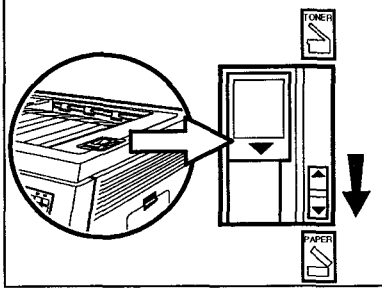

**c.** Grasp the paper under the fuser unit and carefully remove the sheet.

**d.** Close the upper unit, and if you cleared the paper jam, press **Continue/Reset** to resume printing.

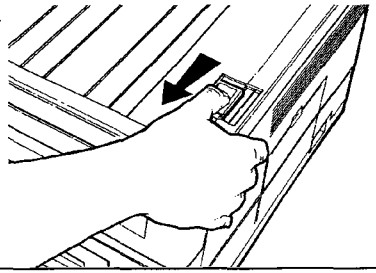
## microLaser XL

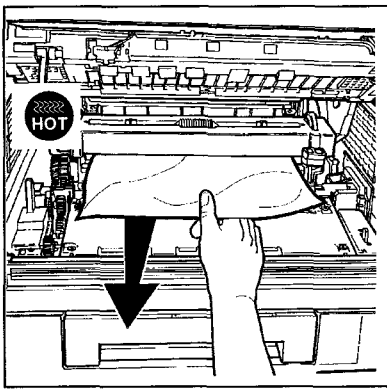
**WARNING: The fuser reaches temperatures as high as 374° F (190° C). To avoid burning your hands, allow the fuser to cool at least five minutes before removing the jammed paper.**

**a.** Slide the selection switch on the top cover to the forward (**PAPER**) position.




**b.** Slide the top cover release switch forward. Allow the middle unit to open about 45 degrees until it stops and latches.






**c.** Grasp the paper under the fuser unit and carefully remove the sheet.

**d.** Lift the middle unit to release the latch, and then close the middle unit.

**e.** Press **Continue/Reset** to resume printing.

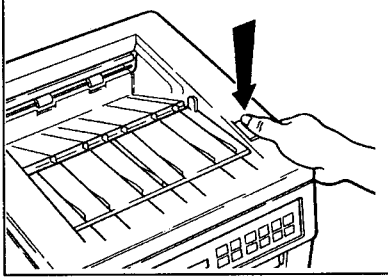
# Clearing a Paper Roller Assembly Jam

Check the paper roller assembly for jams as as follows.

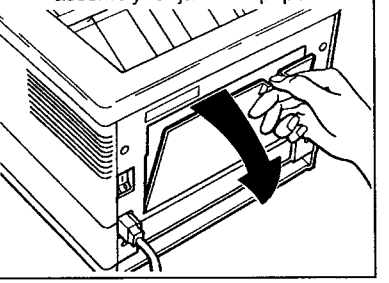
**Note:** A jam at the exit is often a symptom of a problem elsewhere. If jams at exit occur more than infrequently, check for damaged paper in the tray or for a blockage in the paper path.

## microLaser Plus

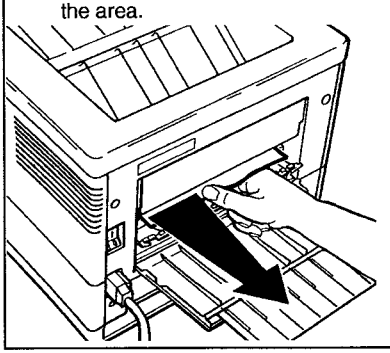
**a.** Press the upper unit release button. Swing the upper unit up about 45 degrees until it stops.



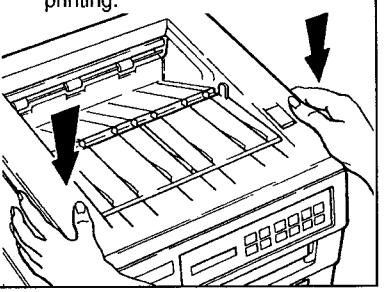
**b.** Open the rear output tray. Lift the paper roller assembly and look under and behind the roller assembly for jammed paper.



**c.** Remove the jammed paper from the area.



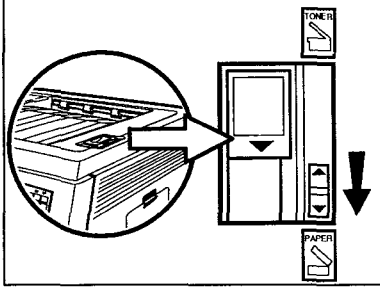
**d.** Close the upper unit, and if you found and cleared the paper jam, press **Continue/Reset** to resume printing.



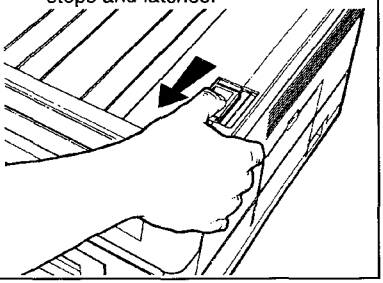
# Clearing a Paper Roller Assembly Jam

## microLaser XL

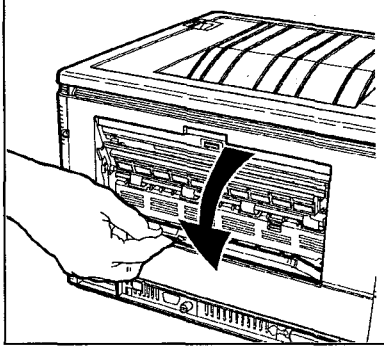
**a.** Slide the selection switch on the top cover to the forward (**PAPER**) position.



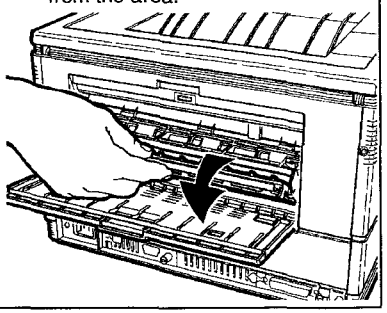

**b.** Slide the top cover release switch forward. Allow the middle unit to open about 45 degrees until it stops and latches.

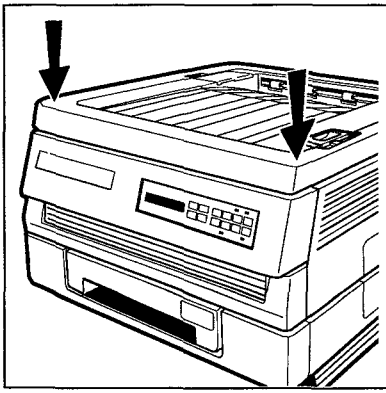


**c.** Open the rear output tray.



**d.** Pull out the paper roller assembly and remove the jammed paper from the area.





**e.** Return the paper roller assembly to its original position, and then close the rear output tray.

**f.** Lift the middle unit to release the latch, and then close the middle unit.

**g.** Press **Continue/Reset** to resume printing.

# 9
# Printing Reports

## This chapter tells you about

- Printing reports
- Understanding printer status
- Determining current available fonts
- Checking the results of the self test

## Contents

# Contents

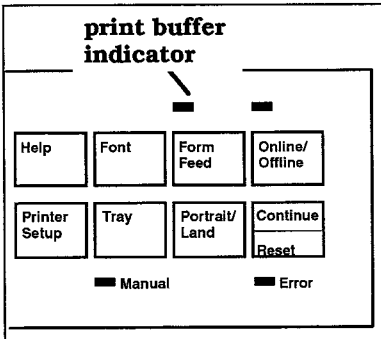
# Selecting a Report to Print

The printer has the following reports available for you to print. These reports can provide you valuable information about the current configuration of your printer.

- Status report
- Fonts report
- Diagnostics report

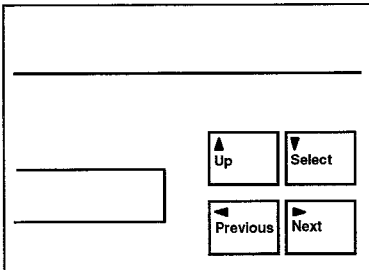
How you select a report depends on whether you have a non-Turbo or Turbo printer.

## Non-Turbo Printer




**a.** Check the Print Buffer indicator immediately above **Form Feed** to ensure that the print buffer is empty. If the indicator is lighted, press **Form Feed** to print the page.

**b.** Press **Printer Setup** to enter setup mode.




**c.** Press ▶ **Next** or ◀ **Previous** until the LCD displays *Setup:Reports*, then press ▼ **Select**.

**d.** Press ▶ **Next** or ◀ **Previous** until the LCD displays *Reports:* followed by the name of the report you want to print, and then press ▼ **Select** to print the report.

# Selecting a Report to Print

## Turbo Printer

In a Turbo printer, the emulator is determined by the configuration for a port. Since the emulator determines the information that goes into a report to print, printing reports is part of the port setup.

To print a report on a Turbo printer, follow these steps.

**Note:** The printer prints status and font reports for the current emulator. If you change emulators, you must exit setup and go back online to activate the emulator before following this procedure to print a report.

1. Press **Printer Setup**.
2. Press ▶ **Next** until the LCD displays the port you want then press ▼ **Select**.
3. Press ▶ **Next** until the LCD displays *Reports* then press ▼ **Select**.
4. Press ▶ **Next** until the LCD displays the report you want then press ▼ **Select**.

# Interpreting a Non-Turbo Status Report

The following illustration shows a sample status report for a non-Turbo printer containing a PostScript board and two memory boards. Refer to the information on the following pages to interpret the status report.

**Note:** The sample report shows the status report as it is printed while a non-Turbo printer is configured for PostScript printing. The HPII status report has slight differences.

**Status Report**

Firmware Revision 4.0.6 | PCU ROM Revision d

**Lifetime Information**

| | |
|---|---|
| Photoconductor Cartridge Count: | 2755 |
| Developer Cartridge Count: | 2755 |

**Memory Status**

| | |
|---|---|
| Level: | 2 |
| Total Memory: | 2621440 |
| Total Free Memory: | 2563554 |
| Largest Block Available: | 2563546 |

**Miscellaneous Setup Parameters**

| | |
|---|---|
| Do Start Page: | NO |
| Wait Time Out: | 40 |
| Auto-Continue: | OFF |
| Power-Up Online: | YES |
| Buffer Size: | 1k |
| Transmit Disable: | NO |
| Busy Offline: | YES |
| Language: | ENGLISH |

**Personal Printer Configurations**

| #1: PS (v4.035) | #2: HPII (v2.0) | #3: HPII (v2.0) | #4: HPII (v2.0) |
|---|---|---|---|
| TINot | Std Parallel | Std Parallel | Std Parallel |
| Std Parallel | Tray 1 | Tray 1 | Tray 1 |
| Tray 1 | Landscape | Portrait | Portrait |
| | 60 Lines/Page | 60 Lines/Page | 60 Lines/Page |
| | Courier 10 PC-8 | Line Printer 16.66 | Courier Bold 10 PC-8 |

**Controller Configuration**

Expansion ROM Detected
RAM Module 1 Detected - 1 MEG Size
RAM Module 2 Detected - 1 MEG Size

64k Band RAM

Memory Drawing Circuit Present

Option Status = 0
ASIC 1 Version : A

# Interpreting a Non-Turbo Status Report

## Revision Levels

Each printer has two revision levels: one for the firmware and one for the printing mechanism. For most users these revision levels are insignificant. If you are adding an option to your printer, however, you might need to have a certain revision level.

### Firmware Revision

Firmware controls the user interface in the printer and includes emulations, control panel, communications, and help pages. If the current personal printer configuration uses the PostScript board, the status report also shows the PostScript version and PostScript printer name.

### PCU ROM Revision

The PCU ROM controls the printing mechanism itself and includes laser control, paper handling, xerographic processing, and so on.

## Lifetime Information

The lifetime information provides the current usage on the photoconductor (OPC) and developer cartridges. You can use this information to predict when to order replacement supplies.

### Photoconductor (OPC) Cartridge Count

The OPC cartridge count is the number of pages printed with the current OPC cartridge.

### Developer Cartridge Count

The developer cartridge count is the number of pages printed with the current developer cartridge.

## Memory Status

The memory status shows how much unused memory your printer has. This information can be important if you are preparing to download fonts or macros. The information

included depends on the emulator in the current personal printer configuration.

### PostScript Memory Status

The PostScript implementation has the following Vmstatus (virtual memory status).

| | |
|---|---|
| Level | Usually 2; useful for debugging PostScript programs |
| Used | User memory currently being used |
| Maximum | Memory remaining after loading PostScript |
| Available | Memory remaining for fonts, graphics, and so on |

### Memory Status of Non-PostScript Emulations

For all non-PostScript printer emulators, the status report shows the following information.

| | |
|---|---|
| Total memory | The total amount of memory in the printer |
| Total free memory | The amount of memory available for use; downloaded fonts and macros reduce the amount of free memory |
| Largest block available | The largest remaining block of contiguous memory, which is required by some printer operations |

## Miscellaneous Parameters

The miscellaneous parameters portion of the status report shows the current selections for the miscellaneous parameters defined during printer setup. Most of the miscellaneous parameters apply to all emulations. A few of them, however, are specific to the emulator. Refer to Chapter 5 for a complete explanation of all miscellaneous parameters except the following.

### Language

*Language* is the currently selected language for the Help pages and LCD messages. Although the help pages and LCD messages are accessible from all printer emulations, the printer must be in the HPII emulator in order to change the language. Refer to Appendix G for the procedure to change the language.

### PostScript Miscellaneous Parameters

The status report for the PostScript interpreter includes the following miscellaneous parameters.

| | |
|---|---|
| Do Start Page | Prints a status report at powerup; default is NO |
| Wait Time Out | Number of seconds with no activity before printer cancels a job in progress; default is 40 seconds |

To change either of these parameters, you must send a short PostScript program from the computer to the printer. Chapter 4 describes the programs.

### Non-PostScript Miscellaneous Parameters

The status report for non-PostScript emulations includes the number of copies and default symbol set. These parameters do *not* apply to the PostScript interpreter.

## Personal Printer Configurations

A non-Turbo printer has four personal printer configurations, which make it easy to move from one kind of printing job to another. The currently selected personal printer configuration is shaded on the status report.

## Controller Configuration

The controller configuration shows the condition of the printer as determined during the last power-up self-test. The controller configuration includes the following.

- Optional boards installed in the printer, including optional memory, serial communications, and PostScript
- Error conditions detected during the self-test

**Note:** Most of this information is also presented graphically with the diagnostic report. Refer to "Interpreting the Diagnostic Report" in this chapter.

## Serial Configuration

If you have an optional serial board installed in a non-Turbo printer, the status report also includes a listing of the current line status (either on or off) of the following signals. This information is necessary only if you are experiencing problems with your serial communication line.

- DTR
- RDY
- DSR
- RTS
- CTS
- DCD

# Interpreting a Turbo Status Report

A status report printed on a Turbo printer has the following differences with a non-Turbo status report.

## Port Configurations

Since a Turbo printer has no personal printer configurations, Port configurations occupy the place on the status report previously occupied by personal printer configurations. The status report shows configurations only for the ports available on the printer.

The port configurations show all of the information previously in the personal printer configurations plus some of the information found previously under Miscellaneous Setup Parameters.

## Buffer Size

On a Turbo printer each port has its own receive buffer. The size of each receive buffer is included as part of the port configuration.

## Port Timeout

The port timeout shows the time in seconds the printer waits following inactivity on the current port before allowing another port to become the active port.

## Controller Configuration Information

When a Turbo board is present, the Controller Configuration section of the status report shows the speed of the Turbo board, the memory on the Turbo board, and any optional memory attached to the Turbo board.

## Miscellaneous Parameters Removed from the Status Report

A Turbo printer has fewer setup parameters for you to define, so these parameters have been removed from the status report.

- Busy offline—A Turbo printer is always busy while offline.
- Transmit disable—Transmission of status information is always enabled on a Turbo printer.
- HPII default symbol set—In the absence of a defined symbol set, the HPII symbol set is always PC-8.

# Interpreting the Font Report

The font report shows the fonts and symbol sets currently available on the printer in the current emulator.

## PostScript Font Report

The following illustration shows a sample font report for a Turbo board or a PostScript board with 35 fonts. If you have additional fonts installed—downloaded or on font cards—these fonts also appear on the report.

FONT REPORT

Cachestatus:

| | |
|---|---|
| Bsize:31132 | Csize: 135 |
| Bmax:220600 | Cmax:3574 |
| Msize: 8 | Blimit: 12500 |
| Mmax: 285 | |

| Font Name | Trademark/Copyright |
|---|---|
| AvantGarde-Book | ITC Avant Garde Gothic is a registered trademark of International Typeface Corporation. |
| AvantGarde-BookOblique | ITC Avant Garde Gothic is a registered trademark of International Typeface Corporation. |
| AvantGarde-Demi | Copyright (c) 1985, 1987 Adobe Systems Incorporated. All rights reserved. ITC Avant Garde Gothic is a registered trademark of International Typeface Corporation. |
| AvantGarde-DemiOblique | Copyright (c) 1985, 1987 Adobe Systems Incorporated. All rights reserved. ITC Avant Garde Gothic is a registered trademark of International Typeface Corporation. |
| Bookman-Demi | Copyright (c) 1985, 1987, 1989 Adobe Systems Incorporated. ITC Bookman is a registered trademark of International Typeface Corporation. |
| Bookman-DemiItalic | Copyright (c) 1985, 1987, 1989 Adobe Systems Incorporated. ITC Bookman is a registered trademark of International Typeface Corporation. |
| Bookman-Light | Copyright (c) 1985, 1987, 1989 Adobe Systems Incorporated. ITC Bookman is a registered trademark of International Typeface Corporation. |
| Bookm an-LightItalic | Copyright (c) 1985, 1987, 1989 Adobe Systems Incorporated. ITC Bookman is a registered trademark of International Typeface Corporation. |
| Courier | Copyright (c) 1989, 1990 Adobe Systems Incorporated. All rights reserved. |
| Courier-Bold | Copyright (c) 1989, 1990 Adobe Systems Incorporated. All rights reserved. |
| Courier-BoldOblique | Copyright (c) 1989, 1990 Adobe Systems Incorporated. All rights reserved. |
| Courier-Oblique | Copyright (c) 1989, 1990 Adobe Systems Incorporated. All rights reserved. |
| Helvetica | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. Helvetica is a trademark of Linotype AG and/or its subsidiaries. |
| Helvetica-Bold | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. Helvetica is a trademark of Linotype AG and/or its subsidiaries. |
| Helvetica-BoldOblique | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. Helvetica is a trademark of Linotype AG and/or its subsidiaries. |
| Helvetica-Narrow | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. Helvetica is a trademark of Linotype AG and/or its subsidiaries. |
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| NewCenturySchlbk-Italic | Copyright (c) 1985, 1987, 1989 Adobe Systems Incorporated. All rights reserved. New Century Schoolbook is a trademark of Linotype AG and/or its subsidiaries. |
| NewCenturySchlbk-Roman | Copyright (c) 1985, 1987, 1989 Adobe Systems Incorporated. All rights reserved. New Century Schoolbook is a trademark of Linotype AG and/or its subsidiaries. |
| Palatino-Bold | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Palatino is a trademark of Linotype AG and/or its subsidiaries. |
| Palatino-BoldItalic | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Palatino is a trademark of Linotype AG and/or its subsidiaries. |
| Palatino-Italic | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Palatino is a trademark of Linotype AG and/or its subsidiaries. |
| Palatino-Roman | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Palatino is a trademark of Linotype AG and/or its subsidiaries. |
| Symbol | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. |
| Times-Bold | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Times is a trademark of Linotype AG and/or its subsidiaries. |
| Times-BoldItalic | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Times is a registered trademark of Linotype AG and/or its subsidiaries. |
| Times-Italic | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Times is a trademark of Linotype AG and/or its subsidiaries. |
| Times-Roman | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. Times is a trademark of Linotype AG and/or its subsidiaries. |
| ZapfChancery-MediumItalic | Copyright (c) 1985, 1987, 1988, 1990 Adobe Systems Incorporated. All rights reserved. ITC Zapf Chancery is a registered trademark of International Typeface Corporation. |
| ZapfDingbats | Copyright (c) 1985, 1987, 1989, 1990 Adobe Systems Incorporated. All rights reserved. ITC Zapf Dingbats is a registered trademark of International Typeface Corporation. |

## HPII Font Report

The following illustration shows a sample font report for the HPII emulator. If you have additional fonts installed—downloaded or on font cards—these fonts also appear on the report.

**Note:** If the font report indicates *Standard* for a font, you can select any of the symbol sets listed at the bottom of the font report.

**Font Report**

**Internal Fonts**

| | | | | |
|---|---|---|---|---|
| COURIER<br>Symbol Sets: Standard | 10 Pitch | 12 Point | v1.7 | ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|<br><ESC>(s0p10h12v0s0b3T |
| COURIER<br>Symbol Sets: Standard | 12 Pitch | 10 Point | v1.7 | ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|<br><ESC>(s0p12h10v0s0b3T |
| COURIER BOLD<br>Symbol Sets: Standard | 10 Pitch | 12 Point | v1.7 | **ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|**<br><ESC>(s0p10h12v0s3b3T |
| COURIER BOLD<br>Symbol Sets: Standard | 12 Pitch | 10 Point | v1.7 | **ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|**<br><ESC>(s0p12h10v0s3b3T |
| COURIER ITAL<br>Symbol Sets: Standard | 10 Pitch | 12 Point | v1.7 | *ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|*<br><ESC>(s0p10h12v1s0b3T |
| COURIER ITAL<br>Symbol Sets: Standard | 12 Pitch | 10 Point | v1.7 | *ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|*<br><ESC>(s0p12h10v1s0b3T |
| LINE PRINTER<br>Symbol Sets: Standard | 16.67 Pitch | 8.5 Point | v1.7 | ABCDEfghijí6\|┤╢╕╣$#$@[]^`{\|<br><ESC>(s0p16.67h8.5v0s0b0T |

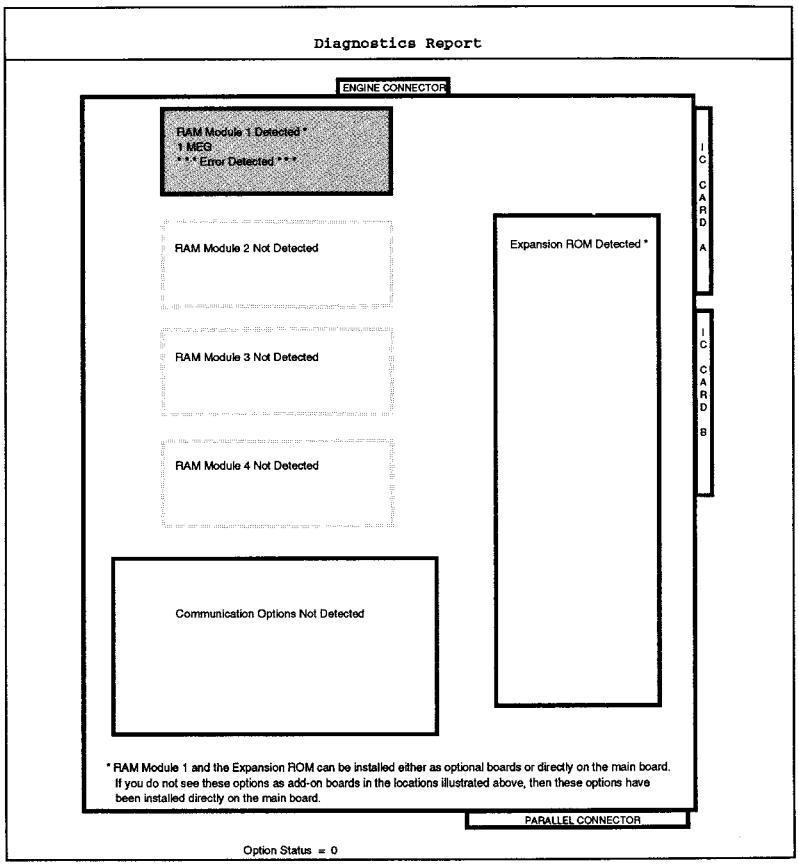
**Standard Symbol Sets**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8U ROMAN-8 | 0N ECMA-94 | 10U PC-8 | 11U PC-8 DN | 12U PC-850 | 2U ISO-2 |
| 1E ISO-4 | 0U ISO-6 | 3S ISO-10 | 0S ISO-11 | 0K ISO-14 | 0I ISO-15 |
| 4S ISO-16 | 2S ISO-17 | 1G ISO-21 | 0F ISO-25 | 2K ISO-57 | 0D ISO-60 |
| 1D ISO-61 | 1F ISO-69 | 5S ISO-84 | 6S ISO-85 | 0G German | 1S Spanish |
| 1U Legal | 0E ROMAN-Ext | | | | |

# Interpreting the Diagnostics Report

The diagnostics report displays a picture of the condition of the optional boards installed on the printer as of the last power-up self-test. In the following sample diagnostics report, the solid lines indicate that one memory (RAM) module and a PostScript module are installed. The shading within the solid lines indicates that an error was detected in the RAM module. Even if the diagnostics report indicates a defective option, you can print using the HPII emulator and the parallel interface.

If you need to remove a defective option, refer to the procedure in Appendix I.



# 10
# Care and Troubleshooting

## This chapter tells you about

- Cleaning your printer
- Troubleshooting problems and interpreting error messages
- Correcting some common operating problems
- Getting help if you cannot correct a problem yourself

## Contents

# Contents

## Cleaning the Outside of the Printer

Always use a soft, lint-free cloth to wipe the outside of the printer. If you need to remove stains or fingerprints from the plastic parts of the printer case, you can moisten the cloth with water and a mild detergent.

**Caution: Do not use abrasive cleansers on the surface. Never use a detergent solution or other liquids on the electronic components of the printer.**

## Cleaning the Inside of the Printer

**WARNING: Always unplug the power cord before cleaning the inside of the printer.**

When operated under normal circumstances, the inside of your printer does *not* require cleaning. If you spill toner inside the printer, the printer may require vacuuming. If you do not have access to a vacuum cleaner especially designed for toner, you need to contact Service to clean the inside of your printer.

**Caution: Never attempt to vacuum the inside of the printer with an ordinary vacuum cleaner. Toner passes through the filter of an ordinary vacuum cleaner and is dispersed into the air.**

# Troubleshooting Tips

## Solving Your Own Problems

When operated within the specifications defined in Appendix A, your printer should give you years of trouble-free service. Even under the best conditions, however, problems can occasionally occur. The following pages help correct the most common problems without an expensive service call.

Before you call your local service representative, try the troubleshooting tips and service checklist in this chapter. If you cannot correct your printer problem using the information in this chapter, you should then contact your authorized service facility.

**Caution: Never attempt to remove the printing mechanism from the case. Only trained service personnel can perform internal repairs. You can damage the printer and void your warranty if you attempt repairs on your own.**

## Checking Error Messages

Many problems are indicated by error messages on the LCD. Refer to the table in this chapter for the meaning of the error messages and possible solutions.

## Inspecting the Printer

If no error message appears, check for the following.

- The Power switch is in the On (I) position.
- The power cord is connected and seated at both ends.
- No printer part (internal or external) is damaged.
- The data cable is connected to the host and seated correctly at both the printer and host.
- The paper meets the specifications in Appendix A.

## Cycling Printer Power

Turning the printer off for ten seconds and then on again can clear some error conditions. Observe the power-up process carefully during the power-up self-test for clues.

## Printing a Report

If you can print a status report, the problem you are experiencing may be in the host or the cable from the host and *not* in the printer.

## Checking the Environment

Common causes of problems are changes in the operating environment of the printer, especially changes in humidity.

- Humidity that is too low, especially common during the winter, causes static-related problems. A humidifier might be needed to correct the problem.
- Humidity that is too high can cause paper to swell, which increases the frequency of paper jams. Loading fresh paper can solve this problem.

## Calling for Help

If you are unable to solve your problem after following the troubleshooting tips and service checklist, call your local authorized Texas Instruments distributor, who is equipped to provide you assistance. If your local authorized Texas Instruments distributor is unavailable or cannot answer your question, you can call Texas Instruments at the numbers listed in Appendix J.

**Note:** Before calling for help, write down the serial number of your printer and print a status report and diagnostics report if possible.

# Service Checklist

| Symptom | Possible Cause | Solution |
|---|---|---|
| No indicators light; no LCD message | Power switch is off | Set Power on (I). |
| | Printer unplugged | Plug in the printer. |
| | Controller board not properly installed | Reseat controller board. Ensure screws are tight (*App. I*). |
| | Controller board bad | Check status LED (*this chapter*). |
| Printer does not complete start up | System memory corrupted | Reset system memory (*this chapter*) |
| Printer inoperative after changing consumables | Cover not closed properly | Turn power off. Open printer and ensure that waste toner bottle is pressed down. Close cover. Turn on power. |
| Printer does not print a file; LCD message *Offline* | Printer offline | Press **Online/Offline** until the green Online indicator lights. |
| Printer does not print a file; LCD message *Online* | Wrong communication interface selected | Ensure that selected I/O value matches host. |
| | Data cable not installed properly | Ensure that data cable connections are secure at the printer and host. |
| Printer does not complete power-up self-test | Power not stable | Change ac power outlet. |
| | Connected SCSI drive not turned on. | Turn on SCSI drive. |
| Printer prints wrong font | Wrong font selected | Change font or select cartridge font. |
| | Font no longer available to printer | Install font card or download font again. |

# Service Checklist

| Symptom | Probable Cause | Possible Solution |
|---|---|---|
| Black vertical lines | Corona wires dirty | Clean transfer corona (*this chapter*); if problem persists, clean charging corona (*this chapter*). |
| Printer prints the wrong data or loses data | Communication interface | Ensure communication values match host. |
| | | Print hex dump to see if host computer is at fault (*Chap. 3*). |
| | Bad data cable | Change data cable. |
| | Data overflow error (serial comm. only) | Change flow control to match host (*Chaps. 3,4, and 7*). |
| | Symbol set mismatch | Ensure symbol set matches host. |
| Poor print quality | Bad OPC | Replace OPC cartridge (*Chap. 1*) |
| | Bad developer | Replace developer/toner (*Chap. 1*). |
| | Paper does *not* meet specifications | Print with plain copier paper (*App. A*). |
| Smeared/dirty printing | Dirty cleaning pad | Change cleaning pad |
| | Fingerprint on OPC | Wipe OPC with a soft, lint-free cloth. |
| | Paper does *not* meet specifications | Print with plain copier paper (*App. A*). |
| Light or dark printing | Contrast needs adjustment | Adjust contrast switch (*this chapter*). |
| | *Paper does not* meet specifications | Print with plain copier paper (*App. A*). |
| | OPC is bad | Replace OPC cartridge (*Chap. 1*) |

# Error Messages

| Error Message | Probable Cause | Possible Solution |
|---|---|---|
| *Add Toner* | Out of toner | Add toner. Press **Continue/Reset** to clear error status. |
| *Clear Paper Jam* | Paper jam | Clear paper jam (*Chap. 8*). *Press* **Continue/Reset** to clear error status. |
| *Cover Open* | Cover open | Close the cover. |
| *Dvlp. Life Over* | Developer at end of rated life | Replace developer cartridge (*Chap. 1*) |
| *Eng Serial Error* | Internal communication problem | Cycle power. If problem persists, call Service. |
| *Feed Letter Man* | Manual tray selected but no paper in manual feed slot | Manually feed paper (*Chap. 8*) |
| *Heater HI Temp* | Fuser temperature too high | Cycle power. If problem persists, call Service. |
| *Heater LO Temp* | Fuser temperature too low | Cycle power. If problem persists, call Service. |
| *Insert Manual Pg* (PostScript only) | Manual tray selected but no paper in manual feed slot | Manually feed paper (*Chap. 8*) |
| *Main Motor Err* | Main motor may be defective | Cycle power. If problem persists, call Service. |
| *NV-RAM Error* | NV-RAM may be defective | Cycle power. If problem persists, call Service. |
| *OPC Life Over* | OPC nearing end of its rated life | Replace OPC cartridge (*Chap. 1*) |
| *Optical Sys Err* | Optical system may be defective | Cycle power. If problem persists, call Service. |

| Error Message | Probable Cause | Possible Solution |
|---|---|---|
| *Page Too Complex* (HPII only) | Too many commands or characters on a page | Simplify the page and print it again |
| *Paper Out* | Out of paper | Load paper (*Chap. 8*). |
| | Requested paper option not installed (*PostScript only*) | Install requested paper option or change tray setting |
| *Paper Tray* (HPII only) | Paper tray removed | Install paper tray (*Chap. 8*). |
| *PCUROM Error* | Printer ROM may be defective | Cycle power. If problem persists, call Service. |
| *Plgn Motor Err* | Polygon motor may be defective | Cycle power. If problem persists, call Service. |
| *Prnter Not Ready* (*microLaser XL* only) (PostScript only) | Printer takes a long time to mix toner | Wait; problem will clear itself. If message lasts longer than 90 seconds, call Service. |
| *Replace Waste Toner Bottle Hit Reset* | Toner added without changing waste toner bottle | Replace the waste toner bottle, then *press* **Continue/Reset**. |
| | False message | Perform fuse flag reset (*this chapter*) |
| *Waste Toner Full* (PostScript only) | Toner added without changing waste toner bottle | Replace the waste toner bottle then press **Continue/Reset**. |
| | False message | Perform fuse flag reset (*this chapter*) |

# Correcting a False Waste Toner Error

If you replace a toner cartridge without changing the waste toner bottle, the LCD displays *Replace Waste Toner Bottle* (HPII) or *Waste Toner Full* (PostScript). When this occurs, you should replace the old waste toner bottle with the waste toner bottle in the toner kit.

**Caution: Never attempt to replace the fuse in the waste toner bottle.**

If you receive a waste toner error message at any time other than immediately after changing the toner cartridge, the error message is false. If this happens, use one of the procedures on the following pages to resume operation without changing the waste toner bottle.

If these procedures do *not* correct the problem, call Service.

**Caution: Do not use this method to resume operation after changing a toner cartridge without first replacing the waste toner bottle.**

## microLaser Plus

For a *microLaser Plus* printer, follow these steps.

1. Turn off the printer.
2. While pressing ▼ **Select** and **Printer Setup** at the same time, turn on the printer. When the LCD displays *PCU DIAG MODE*, release both keys.
3. Press ▲ **Up** and ◀ **Previous** at the same time and continue pressing about five seconds until the LCD displays *FUSE FLAG RESET* then release both keys.
4. Turn off the printer.
5. Turn on the printer. You can resume normal operation.

# Correcting a False Waste Toner Error

## microLaser XL

On a *microLaser XL* printer, you can receive a waste toner error after the side access door has been opened. When this is the cause of the waste-toner error, you can resume printing by pressing **Continue/Reset**.

If pressing **Continue/Reset** does *not* resolve the problem, follow these steps to resume printing.

1. Turn off the printer.

2. Press ▼ **Select** and **Printer Setup** at the same time, and while continuing to press them, turn on the printer. When the LCD displays *PCU DIAG MODE*, release both keys.

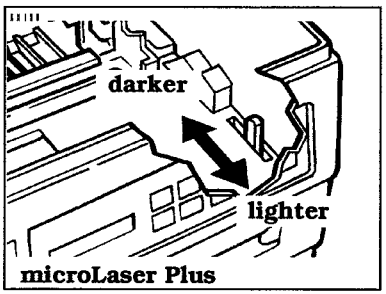
3. Press ▲ **Up** and ▶ Next at the same time and continue pressing about five seconds until the LCD displays *FUSE FLAG RESET* then release both keys.

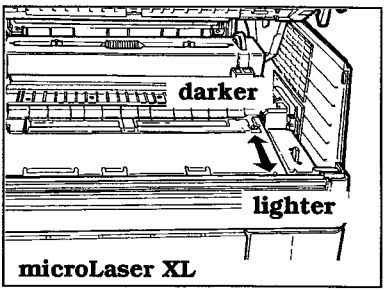
4. Turn off the printer.

5. Turn on the printer. You can resume normal operation.

# Adjusting the Contrast Switch

Each printer has a contrast switch as part of the printing mechanism. Adjusting the contrast switch can increase or decrease the amount of toner used during printing, which increases or decreases print darkness. The contrast switch has four positions (five on the *microLaser XL*). The factory default position for the contrast switch is the second position (third position on the *microLaser XL*), which is usually the best position for most printing tasks.




## Adjusting for Darker Printing

When you set the contrast switch to a higher position, the printer uses toner more quickly. You might want to increase the contrast if you are printing on a paper with a textured finish or with a high cotton content, or your OPC cartridge is printing lighter as it nears the end of its life.

## Adjusting for Lighter Printing

Although setting the contrast switch in a lower position reduces the amount of toner the printer uses, this is *not* recommended unless you plan to use your printer exclusively for printing drafts or other documents where high print quality is unnecessary.

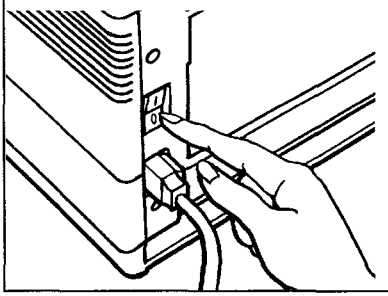
# Cleaning the Transfer Corona

If you are experiencing vertical black lines on your printed pages, follow these steps to clean the transfer corona.

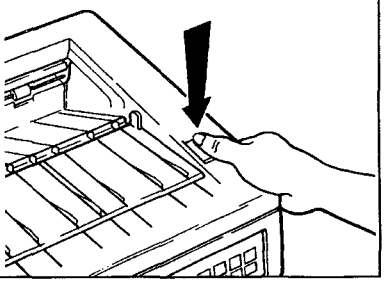
## microLaser Plus

### 1. Prepare the printer.

**a.** Place the power switch in the off (**I**) position .

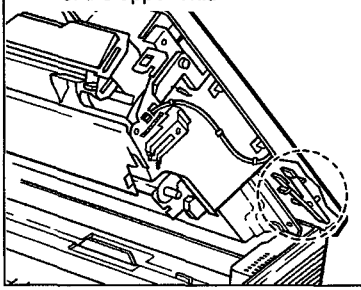


**b.** Press on the upper unit release button. Swing the upper unit up about 45 degrees until it stops.

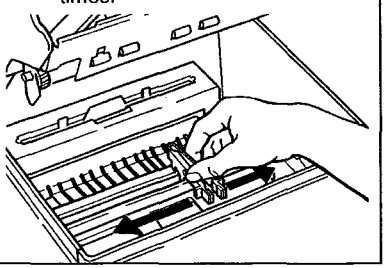


### 2. Clean the transfer corona.

**a.** Remove the corona cleaning tool from its holder on the right part of the upper unit.



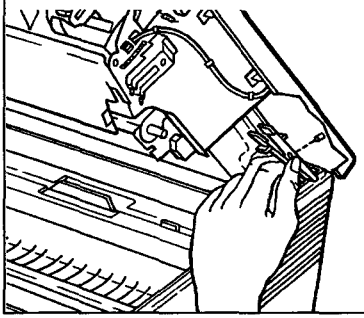
**b.** Pressing the tool *gently* against the transfer corona wire, slide the tool back and forth several times.



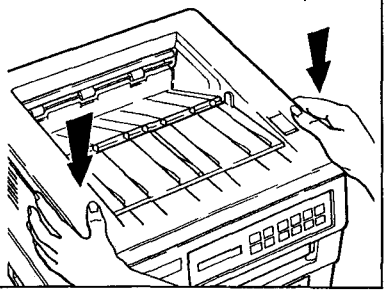
# Cleaning the Transfer Corona

## 3. Return the printer to operation.

**a.** Return the tool to its holder.



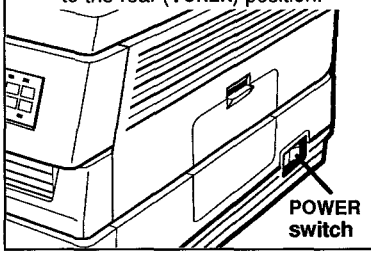
**b.** Press down on the upper unit until it latches shut. Turn on the printer.



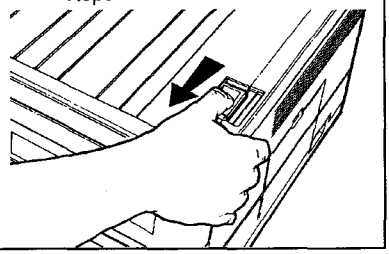
# microLaser XL

## 1. Prepare to clean the transfer corona.

**a.** Place the **POWER** switch in the **OFF** (**O**) position. Slide the selection switch on the top cover to the rear (**TONER**) position.

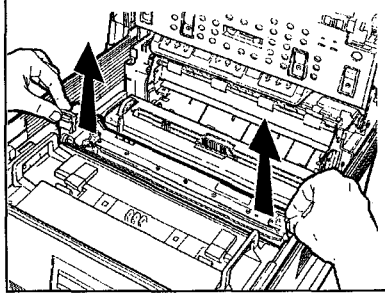



**b.** Slide the top cover release switch forward, and open the top access door 90 degrees until it stops.

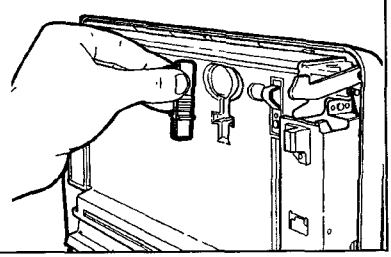


## 2. Clean the transfer corona.

**c.** Remove the OPC cartridge and set it on a flat surface.

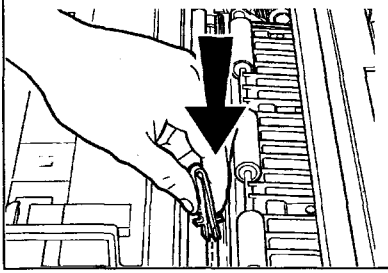


**d.** Remove the corona wire cleaning tool from the right side of the upper unit.

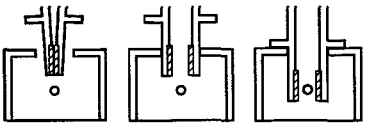


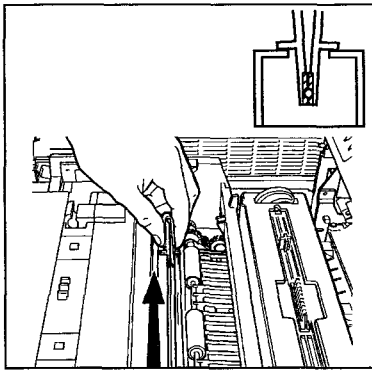
# Cleaning the Transfer Corona

**a.** Squeeze the corona cleaning tool and insert it partially into the slot in the lower unit.



**b.** Release the pressure on the corona cleaning tool and insert it as far as it will go into the slot.





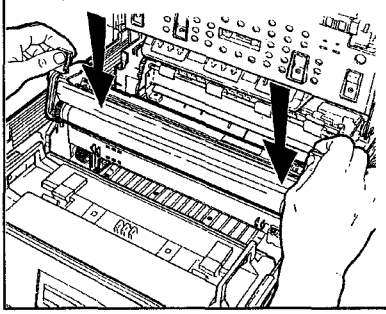
**c.** While squeezing the corona cleaning tool around the corona wire, slide the corona cleaning tool *once* from *right to left* down the length of the corona wire.

**d.** Remove the corona cleaning tool from the slot.

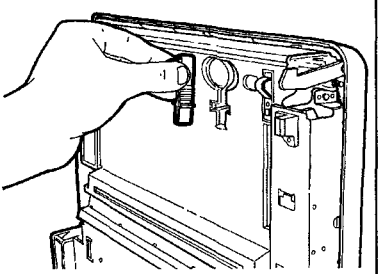
**e.** Repeat steps **a** through **d** four or five times ensuring that you always slide the corona cleaning tool from right to left.

## 3. Return the printer to operation.

**a.** Return the OPC cartridge to the printer.

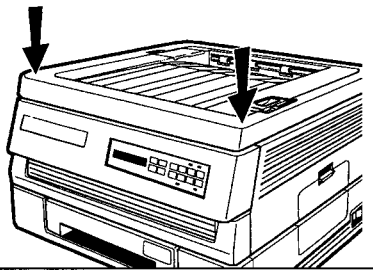


**b.** Return the corona wire cleaning tool to its holder in the upper unit.

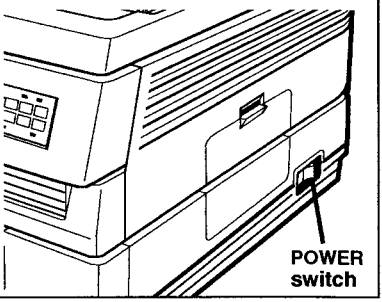


# Cleaning the Transfer Corona

**c.** Close the upper unit, and press down on the upper unit until it latches shut.



**d.** Place the **POWER** switch in the **ON (I)** position.



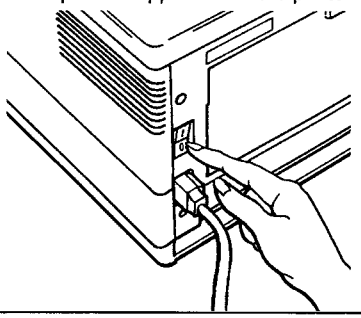
# Cleaning the Charging Corona

If you are experiencing vertical black lines on your printed pages and you have cleaned the transfer corona as described in this chapter, follow these steps to clean the charging corona located on the OPC cartridge.

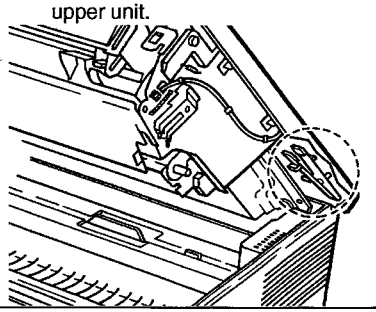
## microLaser Plus

### 1. Remove the corona wire cleaning tool.

**a.** Turn off power to the printer and open the upper unit of the printer.



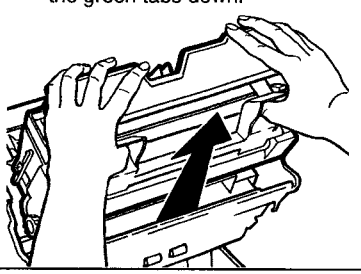
**b.** Remove the corona wire cleaning tool from the right side of the upper unit.



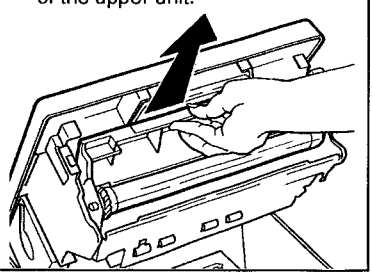
### 2. Remove the OPC cartridge.

**Caution: Do *not* put the OPC cartridge down during this procedure. Resting the OPC cartridge on the green OPC drum can damage the drum and reduce print quality.**

**a.** Remove the developer/toner assembly up and out of the upper unit and set it aside with the green tabs down.



**b.** Grasp the OPC cartridge by the ledge under the label and slowly pull the OPC cartridge straight out of the upper unit.

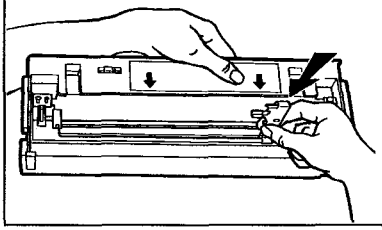


↪

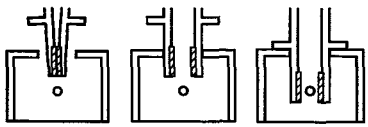
# Cleaning the Charging Corona

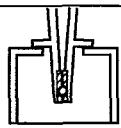
## 2. Scour the charging corona.

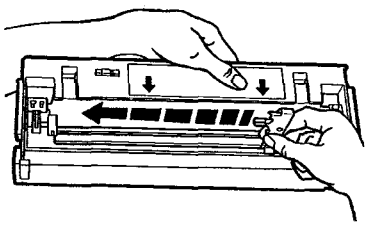
**a.** Holding the OPC cartridge in one hand, squeeze the corona cleaning tool together and insert it partially into one end of the slot on the OPC cartridge.



**b.** Release the pressure on the corona cleaning tool and insert it as far as it will go into the slot.





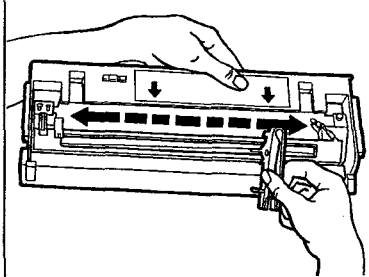


**c.** While squeezing the corona cleaning tool together around the corona wire, slide the corona cleaning tool *once* down the entire length of the corona wire.

**d.** Remove the corona cleaning tool from the slot.

**e.** Repeat steps **a** through **d** four or five times ensuring that you slide the corona cleaning tool in the same direction each time.

## 3. Clean dust from charging corona.

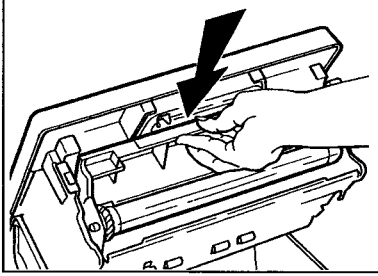


**a.** Insert the felt tipped part of the corona cleaning tool into the groove on the OPC cartridge.

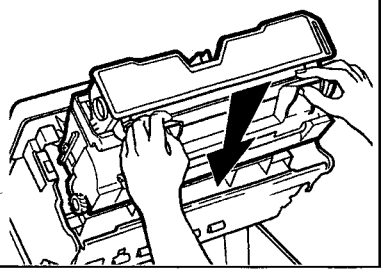
**b.** *Gently* pressing against the charging corona wire, slide the corona cleaning tool back and forth several times to remove dust.

## 4. Return the consumable supplies to the printer.

**a.** Grasp the OPC cartridge by the ledge under the label, and insert it into the upper unit guides.

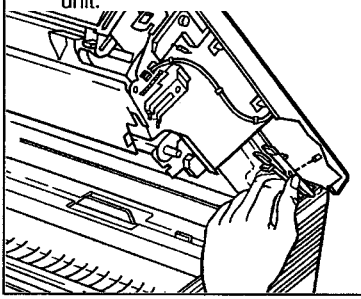


**b.** Insert the developer/toner assembly into the upper unit guides.

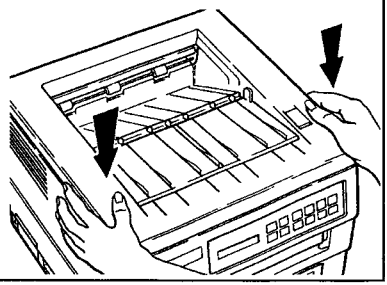


## 5. Return the printer to operation.

**a.** Return the corona wire cleaning tool to its holder in the upper unit.



**b.** Press down on the upper unit until it latches shut. Turn on the printer.

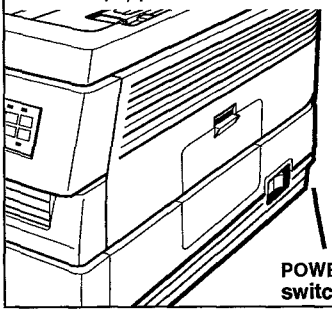


# Cleaning the Charging Corona

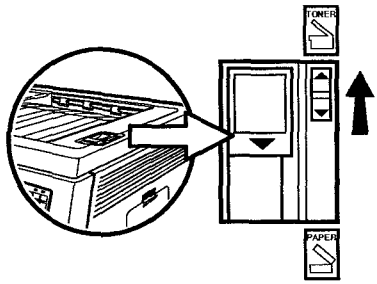
## microLaser XL

### 1. Prepare to clean the charging corona.

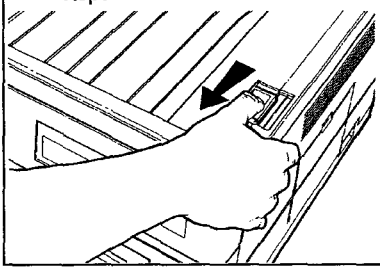
**a.** Place the **POWER** switch in the **OFF (O)** position.



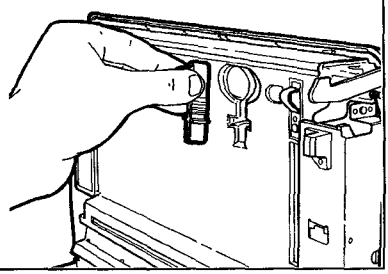

**b.** Slide the selection switch to the rear (**TONER**) position.




**c.** Slide the top cover release switch forward, and open the top access door 90 degrees until it stops.

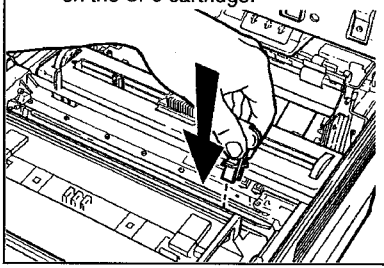


**d.** Remove the corona wire cleaning tool from the right side of the upper unit.

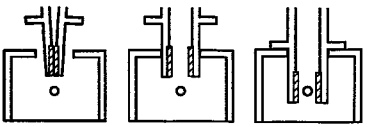


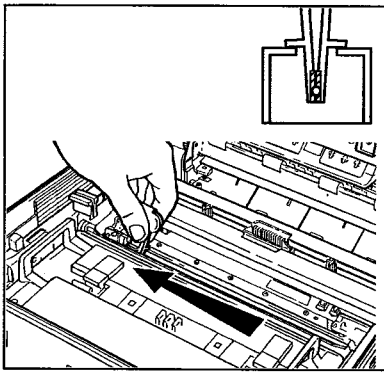
## 2. Clean the charging corona.

**a.** Squeeze the corona cleaning tool together and insert it partially into one end of the slot on the OPC cartridge.



**b.** Release the pressure on the corona cleaning tool and insert it as far as it will go into the slot.





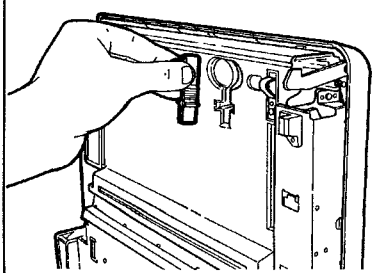
**c.** While squeezing the corona cleaning tool around the corona wire, slide the corona cleaning tool *once* from *right to left* down the length of the corona wire.

**d.** Remove the corona cleaning tool from the slot.

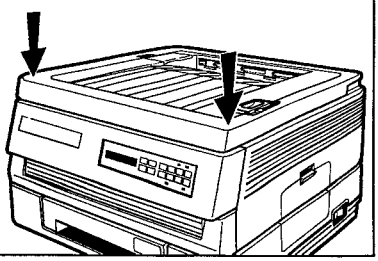
**e.** Repeat steps **a** through **d** four or five times ensuring that you slide the corona cleaning tool in the same direction each time.

## 3. Return the printer to operation.

**a.** Return the corona wire cleaning tool to its holder in the upper unit.



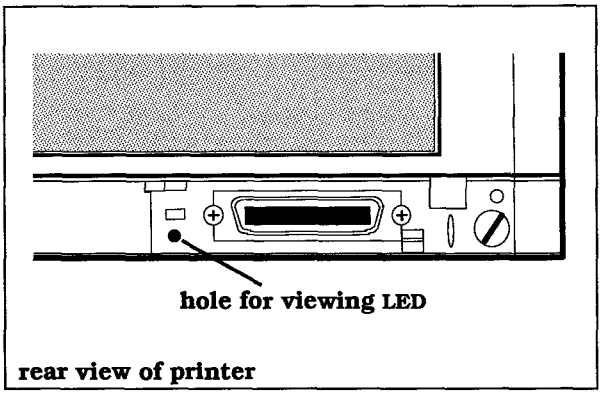
**b.** Close the upper unit and press down on the upper unit until it latches shut. Place the **POWER** switch in the **ON (I)** position.



# Checking the Status of the Controller Board

The controller board has a green light emitting diode (LED) that indicates the result of the power-up self-test on the controller board.

**Note:** The printer does *not* write anything on the LCD until after the controller board successfully completes the power-up self-test. Consequently, you never need to check the status of the controller board as long as the LCD displays anything intelligible.




**rear view of printer**

To view the LED, look through the viewing hole to the left of the parallel connector on the back of the printer.

The condition of the LED indicates the result of the power-up self-test as follows.

- On—the controller board failed the power-up self-test.
- Blinking—the print engine failed the power-up self-test.
- Off—the controller passed the power-up self-test.

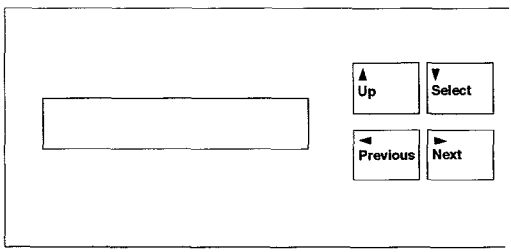
If the LED is on or blinking, contact Service.

# Resetting System Memory

System memory can become corrupted for a variety of reasons. When system memory is corrupted, the printer cannot complete the power-up self-test. To correct the problem, follow these steps to reset the system memory to its factory default condition.

1. Place the Power switch in the off (O) position.

2. Place the Power switch in the on (I) position and immediately press all four arrow keys at the same time.




3. Release the arrow keys.

The system memory is now in its default condition, and you can configure the printer to meet your requirements.

# Replacing the Fuser

On the *microLaser XL* printer you can replace the fuser. A new fuser lasts 200,000 pages depending on usage. The printer does *not* display a message when the fuser reaches 200,000 pages.

You can continue to print with a fuser until you experience print quality problems that persist after you change your developer and OPC cartridge. The most likely problems are vertical lines caused by wear on the surface of the fuser.

For direction on replacing the fuser, follow the instructions that accompany the Fuser kit.

**Warning: The fuser is very hot. To prevent burns, allow at least 15 minutes for cooling before replacing it.**

# A
# Printer and Paper Specifications

This appendix contains the specifications for the *microLaser Plus* and *microLaser XL* laser printers, as well as for the paper and other types of materials on which you can print using these printers.

# Printer Specifications

| | *microLaser Plus* | *microLaser XL* |
|---|---|---|

## Power Requirements

| | | |
|---|---|---|
| Maximum power: | 700 W | 1.0 KW |

### Domestic U.S.A.

| | |
|---|---|
| Nominal voltage: | 110 Vac or 120 Vac |
| Voltage range: | 99 to 132 Vac |
| Frequency: | 48 to 63 Hz |

### International

| | |
|---|---|
| Nominal voltage: | 220 Vac or 240 Vac |
| Voltage range: | 198 to 264 Vac |
| Frequency: | 48 to 63 Hz |

## Physical Dimensions

Excluding options and accessories

| | | |
|---|---|---|
| Width: | 13.4 in (240mm) | 15.8 in (400 mm) |
| Depth: | 14.2 in (360mm) | 16.6 in (420 mm) |
| Height: | 10.9 in (267mm) | 10.9 in (278 mm) |
| Weight: | 33 lb (15 kg) | 45.1 lb (25 kg) |

## Acoustic Noise

| | | |
|---|---|---|
| During operation | <50dBA | < 53 dBA |
| Standby: | <45dBA | < 45 dBA |

## Operating Environment

| | |
|---|---|
| Temperature: | 40° F to 95° F<br>(10° C to 35° C) |
| Relative humidity: | 20 to 85 percent (noncondensing) |

Altitude: 8200 ft (2500 m) maximum)

## Storage and Transportation Environment

Temperature: 14° F to 122° F
(–10° C to 50° C)

Relative humidity: 10 to 90 percent (noncondensing)

**Caution: Storage of supplies at temperatures above 95° F (35° C) and over 80% relative humidity can shorten the life of the supplies.**

Altitude: 49,000 ft (15,000 m)

## Liquid Crystal Display (LCD)

Size: 16 characters, one line

## Control Panel

Type: 12 touch switches

### RAM

System memory: 512 K Bytes
(expandable to 4.5 M Bytes)

Turbo memory: 2 M Bytes
(expandable to 6 M Bytes)

## Data

### Centronics-Style Parallel Interface

Line levels: 0 or +5 Vdc

Characters per second: 5,000 cps maximum

Line control: STROBE/ACKNOWLEDGE

# Printer Specifications

## RS-232-C Serial Interface (Optional)

| | |
|---|---|
| Specification: | EIA RS-232-C standard subset |
| Line levels: | –12 Vdc and +12 Vdc |
| Code Type: | ASCII and similar international codes |
| Bits per second: | 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600 |
| Busy handling protocols: | DC1/DC3 (Xon/Xoff), Robust-Xon, ETX/ACK, Busy-on DTR, Pin-11-ON for-Ready, Pin-11-OFF for-Ready |

## RS-422 Serial Interface (Optional)

| | |
|---|---|
| Specification: | EIA RS-422-A standard subset |
| Line levels: | –2 to –6 Vdc and +2 to +6 Vdc differential between paired lines |
| Code type: | ASCII and similar international codes |
| Bits per second: | 300, 600, 1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600 |
| Busy handling: | DC1/DC3 (Xon/Xoff), Robust-Xon ETX/ACK |

## AppleTalk Serial Interface (Optional)

| | |
|---|---|
| Specification: | EIA RS-422-A standard subset |
| Line levels: | –2 to –6 Vdc and +2 to +6 Vdc differential between paired lines |
| Code type: | ASCII and similar international codes |
| Bits per second: | 230,400 |
| Busy handling: | SDLC, bit-oriented, synchronous protocol |

| | *microLaser Plus* | *microLaser XL* |
|---|---|---|

## Printer

| | | |
|---|---|---|
| Method: | Semiconductor laser → Optics → Electrophotography | |
| Speed: | 9 ppm maximum | Up to 16 ppm continuous printing 5% black pages |

**Note:** Print speed can be reduced on the *microLaser XL* if printing pages with a black density higher than 10%, since the printer must mix toner more frequently. As the level of toner in the developer becomes lower, mixing toner takes longer, which can further reduce the print speed.

| | | |
|---|---|---|
| Duty cycle (pages/month): | Up to 10,000 | Up to 25,000 |
| Resolution: | 300 by 300 dots per inch maximum | |
| Line length | | |
| Portrait | Letter/legal: | 8.0 in (203.2 mm) |
| | Half letter: | 5.0 in (127 mm) |
| | Executive: | 6.75 in (171.4 mm) |
| | A4: | 7.7 in (198 mm) |
| | B5: | 6.5 in (165 mm) |
| Landscape | Letter: | 10.5 in (266.7 mm) |
| | Legal: | 13.5 in (343 mm) |
| | Half letter: | 8.0 in (203.2 mm) |
| | Executive: | 10.0 in (254 mm) |
| | A4: | 11.2 in (285 mm) |
| | B5: | 9.3 in (236 mm) |

# Printer Specifications

| | *microLaser Plus* | *microLaser XL* |
|---|---|---|
| Paper sizes | | |
| Letter: | 8.5 by 11.0 in (215.9 by 279.4 mm) | |
| Legal: | 8.5 by 14.0 in (215.9 by 355.6 mm) | |
| Half letter: | 5.5 by 8.5 in (139.7 by 215.9 mm) | |
| Executive: | 7.25 by 10.5 in (184.1 by 266.7 mm) | |
| A4: | 210 by 297 mm (8.27 by 11.69 in) | |
| B5: | 182 by 257 mm (7.17 by 10.12 in) | |
| Paper input | | |
| Standard paper tray: | 250 sheets 20 lb (75 $g/m^2$) paper | |
| Optional paper feeder: | 250 sheets 20 lb (75 $g/m^2$) paper | 500 sheets 20 lb (75 $g/m^2$) paper |
| Envelope feeder: | Up to 40 env. | Up to 70 env. |
| Paper output | | |
| Face down: | 250 sheets 20 lb (75 $g/m^2$) paper | |
| Face up: | 30 sheets 20 lb (75 $g/m^2$) paper | 50 sheets 20 lb (75 $g/m^2$) paper |

# Paper Specifications

| | |
|---|---|
| Weight | |
| Standard tray: | 16 to 24 lb (60 to 90 $g/m^2$) |
| Manual: | 16 to 36 lb (90 to 135 $g/m^2$)<br>(28 lb maximum for legal size) |
| Length/width: | Specified dimension ±0.03 in (0.7 mm) |
| Angle of sides: | 86 to 94 degrees |
| Smoothness | |
| Face: | >20 seconds (BEKK method) |
| Back: | 20 seconds (BEKK method) |
| Porosity: | >7 seconds (BEKK method) |
| Opacity: | >77% |
| Surface resistance: | $5 \times 10^8$ ohms (20°C, 65% R.H.) |
| Stiffness | |
| Vertical: | >17cm (Clark method) |
| Horizontal: | >13cm (Clark method) |
| Moisture content: | 5.5% ±1.0% |
| Thickness: | $3 \times 10^{-3}$ in–$4.3 \times 10^{-3}$in<br>(0.076 mm–0.109 mm) |

To ensure print quality, use paper with a smooth, hard surface. Paper manufactured specifically for laser printing or photocopying works best in your printer. Xerox 4024 and 4200 and Canon NP papers work well.

When you want to use cotton bond paper for a particular application, select cotton bond paper manufactured especially for laser printing that meets the paper specifications. Do *not* use coated paper or textured paper, such as cockle or woven-finished paper.

# Paper Specifications

Paper must be free of cuts, tears, scratches, staples, grease spots, loose particles, dust, wrinkles, voids, perforations, and curled or bent edges. Paper stock should be stored flat in low humidity.

## Preprinted Forms and Letterhead

The ink on preprinted forms and letterheads must *not* melt, release hazardous gases, or come off the paper when subjected for one second to a temperature of 365° F (185° C). The ink must also have a high resistance to oil, especially silicon oil, and should *not* be affected by components in the toner. The ink must *not* be flammable nor have an adverse effect on any printer rollers.

# Envelope Specifications

| | |
|---|---|
| Weight: | 16 to 24 lb (60 to 90 $g/m^2$) |
| Thickness: | $4 \times 10^{-3}$ to $5 \times 10^{-3}$ in (0.1 to 0.13 mm) |
| Length: | 6.5 to 14.0 in (165 to 357 mm) |
| Width: | 3.5 to 8.5 in (89 to 216 mm) |

The adhesive must *not* melt, release hazardous gases, or come off the paper when subjected for one second to temperatures of 365° F (185° C).

**Caution: Envelopes must be free of plastic windows, metal fasteners, and other projections. Printing on such envelopes can cause serious damage to the printer.**

To avoid jams, avoid envelopes with any of the following characteristics.

- Edges with more than two thicknesses
- Shiny or textured surface
- Peel-off strips
- More than one flap
- Folds that are not sharply creased
- Embossing

# Projector Film Specifications

| | |
|---|---|
| Weight: | 36.8 to 38.9 lb (138 to 146 $g/m^2$) |
| Thickness: | $3.9 \times 10^{-3}$ to $4.3 \times 10^{-3}$ in (0.1 to 0.11 mm) |
| Length/Width: | Specified dimension ±0.03 in (0.7 mm) |
| Angle of sides: | 89 to 91 degrees |

**Caution: Use only film that is specifically designated for laser printers or xerographic copiers.**

Transparency film with an attached paper backing produces the highest quality transparencies.

| | |
|---|---|
| Base weight: | 12.5 to 14.1 lb (47 to 53 $g/m^2$) |
| Base coating weight: | 3.5 to 4.8 lb (13 to 18 $g/m^2$) |
| Face sheet weight: | 12.5 to 14.7 lb (47 to 55 $g/m^2$) |
| Total weight: | 28.8 to 34.1 lb (108 to 128 $g/m^2$) |
| Total thickness: | $4.5 \times 10^{-3}$ to $5.3 \times 10^{-3}$ in (0.115 to 0.135 mm) |
| Length/Width: | Specified dimension ±0.02 in (0.5 mm) |
| Angle of sides: | 89.5 to 90.5 degrees |

**Caution: If adhesives come in direct contact with any part of the printer, the OPC cartridge or developer could be damaged and/or the printer could require extensive cleaning.**

The adhesive must *not* extend beyond the edges of the labels. Adhesive must *not* melt, release hazardous gases, or allow the face sheet to separate from the label when subjected for one second to temperatures of 365° F (185° C).

The top sheet should cover the base sheet from edge to edge with no spaces between individual labels.

Perforations should not extend through the base sheet.

# B
# Options

The *microLaser Plus* and *microLaser XL* printers have a number of options to extend their capabilities. This appendix lists the available options with a brief description of their capabilities.

- Some options apply to all printers.
- Some options are specific to the *microLaser Plus* or *microLaser XL* printer.
- Some options are available for Turbo printers only.

To order an option, call the dealer from which you purchased your printer or call the number on the inside back cover for the name of a dealer near you.

# Standard Printer Options

## PostScript Board

You can add one of two optional PostScript boards to a standard printer.

- TI Part No. 2559978-0002 adds the PostScript interpreter and 35 PostScript fonts.
- TI Part No. 2559978-0003 adds the PostScript interpreter and 17 PostScript fonts.

The PostScript page description language is the industry standard for desktop publishing and computer graphics. The PostScript board attaches to the printer controller board, leaving both card slots available for additional font or emulator cards.

**Note:** These kits come with one 1 MB Memory board. To print on legal-size paper with the PostScript interpreter, you need at least 2.5 MB of memory (two 1 MB Memory boards).

## Serial Interface Board

The Serial Interface board (TI Part No. 2559910-0001) adds RS-232-C communication capabilities to the printer. With the Serial Interface board in place, you can still connect to a computer using the parallel interface.

## AppleTalk Board

The AppleTalk board (TI Part No. 2555741-0001) adds the AppleTalk and RS-422 communication in addition to RS-232-C communication to the printer. To use AppleTalk, you must also have a PostScript board and at least one 1MB memory board.

## 1 MB Memory Board

The 1 MB Memory board (TI Part No. 2555739-0001) adds 1M byte of system memory to the printer. The printer can hold up to 4 memory boards, for a total capacity of 4.5M bytes of memory. Additional memory may be required for the following.

- Printing on legal-size paper with the PostScript interpreter
- Printing complex graphic images with some PostScript applications
- Downloading numerous fonts
- Printing full-page, high-resolution graphics
- Storing numerous macros
- Using the PostScript emulator
- Increasing the size of the receive buffer

**Note:** The 1 MB Memory Board does *not* increase the amount of processing memory available to a Turbo printer for PostScript printing.

## HPII Font Cards

You can order font cards for the HPII emulator. The font cards extend the printing capabilities of the printer without the time-consuming process of downloading fonts.

The following font cards are available.

| Font Card | TI Part No. |
|---|---|
| Presentor I | 2559859-0001 |
| Tax I | 2559859-0005 |
| Typewriter I | 2559859-0006 |
| Master Composition I | 2559859-0007 |
| Spreadsheets & Math | 2559859-0008 |
| International Series | 2559859-0009 |
| Bar Codes & Forms I | 2559859-0010 |

New font offerings are occasionally added to those available for order. Contact your dealer for a list of the currently available font cards.

## Emulation Cards

An emulation card gives the printer the ability to emulate another printer. The following emulation cards are available.

| Emulation Card | TI Part No. |
|---|---|
| Epson FX | 2559932-0001 |
| Diablo 630 | 2559932-0002 |
| IBM Proprinter | 2559932-0003 |
| TI 800 | 2559932-0004 |

New emulators are occasionally added to those available for order. Contact your dealer for a list of the currently available emulation cards.

## Turbo Upgrade Kit

The Turbo Upgrade Kit (TI Part No. 2560050-0001 for *microLaser Plus* printer and 2560050-0002 for *microLaser XL* printer) converts a standard printer to a Turbo printer. The Turbo board attaches directly to the controller board. In addition to high-speed PostScript Level 2 processing, the Turbo board adds 2 M Bytes of memory for PostScript use.

---

**Note:** A printer cannot have both a PostScript board and a Turbo board installed at the same time. When PostScript chips have been installed directly on the controller board, however, you can install the Turbo board without removing the PostScript chips from the controller board.

---

## Optional Memory

You can attach one of the following optional memory board to the Turbo board to increase the memory available for PostScript processing.

- 1 M Bytes (TI Part No. 2560052-0001)
- 4 M Bytes (TI Part No. 2560052-0002)

## Comm+SCSI Board

The Comm+SCSI board (TI Part No. 2560054-0001) adds the following communication capability to the printer.

- RS232/RS422 serial communications
- AppleTalk
- SCSI interface for connecting to a hard disk for storing PostScript fonts, forms, and so on.

With a Comm+SCSI board installed, you can have up to three concurrent, active communication interfaces: parallel, serial, and AppleTalk.

## Envelope Feeder

The *microLaser Plus* Envelope Feeder (TI Part No. 2559875-0002) attaches to the manual feed slot for automatic feeding of envelopes. The envelope feeder is the only reliable way to feed envelopes automatically. The envelope feeder holds up to 40 envelopes at one time.

## Optional Paper Feeder

The *microLaser Plus* Optional Paper Feeder (TI Part No. 2559874-0002) sits beneath the printer and provides a second tray as a source for paper. With the optional paper feeder installed, your printer can hold the following.

- Up to 500 sheets of paper
- Two different sizes of paper (one size in the standard tray and one in the optional paper feeder)
- Both letterhead and second sheets

## Manual Feed Guide

The manual feed guide (TI Part No. 2559966-0002) attaches to the manual feed slot on the front of the printer. The manual feed guide provides a larger left guide and an adjustable right guide to help you keep manually fed paper straight as it passes through the printer.

## Extra Paper Trays

Each *microLaser Plus* printer comes equipped with one standard paper tray.

- Domestic U.S. units have letter-size trays (8½ × 11)
- International units have A4-size trays (210 mm × 297 mm)

You can order extra paper trays in the following sizes.

| Paper size | Dimensions | TI Part Number |
|---|---|---|
| Letter | 8½ in × 11 in | 2559882-0007 |
| Legal | 8½ in × 14 in | 2559882-0008 |
| Executive | 7¼ in × 10½ in | 2559882-0011 |
| Half-letter (Invoice) | 5½ in × 8½ in | 2559882-0012 |
| A4 | 210 mm × 297 mm | 2559882-0009 |
| B5 | 182 mm × 257 mm | 2559882-0010 |

**Note:** You can use these paper trays in either the standard paper feeder or the optional paper feeder.

## Envelope Feeder

The *microLaser XL* Envelope Feeder (TI Part No. 2569505-0001) attaches to the manual feed slot for automatic feeding of envelopes. The envelope feeder is the only reliable way to feed envelopes automatically. The envelope feeder holds up to 75 envelopes at one time.

## Optional Paper Feeder

The *microLaser XL* Second Paper Feeder (TI Part No. 2569506-0001) sits beneath the printer and provides a second 500-sheet tray as a source for paper. With the optional paper feeder installed, your printer can hold the following.

- Up to 750 sheets of paper
- Two different sizes of paper (one size in the standard tray and one in the optional paper feeder)
- Both letterhead and second sheets

## Extra Paper Trays

Each *microLaser XL* printer comes equipped with one standard paper tray.

- Domestic U.S. units have letter/legal trays (8½ × 11 in and 8½ × 14 in).
- International units have A4-size trays (210 mm × 297 mm).

## Standard Paper Trays

You can order extra paper trays in the following sizes.

| Paper size | Dimensions | TI Part Number |
|---|---|---|
| Letter/Legal | 8½ in × 14 in | 2569507-0001 |
| A4 | 210 mm × 297 mm | 2569507-0002 |
| B5 | 182 mm × 257 mm | 2569507-0003 |
| Executive | 7¼ in × 10½ in | 2569507-0004 |
| Half-letter (Invoice) | 5½ in × 8½ in | 2569507-0005 |

## Optional Paper Feeder Trays

The optional paper feeder uses a different size paper tray that holds up to 500 sheets. You can order the following sizes for the optional paper feeder.

| Paper size | Dimensions | TI Part Number |
|---|---|---|
| Letter | 8½ in × 11 in | 2569517-0001 |
| A4 | 210 mm × 297 mm | 2569517-0002 |
| Legal | 8½ in × 14 in | 2569517-0003 |

# C
# HPII Symbol Sets

The resident fonts for the HPII emulator have the following symbol sets.

- PC-8
- Roman-8
- Roman Extension
- PC-8 DN
- PC-850
- ECMA-94
- Legal
- 19 country-specific symbol sets

The following pages show these symbol sets.

# PC-8 Symbol Set

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | NULL | ► | SPACE | 0 | @ | P | ` | p | Ç | É | á | ▒ | └ | ╨ | α | ≡ |
| 1 | ☺ | ◄ | ! | 1 | A | Q | a | q | ü | æ | í | ▒ | ┴ | ╤ | β | ± |
| 2 | ☻ | ↕ | " | 2 | B | R | b | r | é | Æ | ó | ▒ | ┬ | ╥ | Γ | ≥ |
| 3 | ♥ | ‼ | # | 3 | C | S | c | s | â | ô | ú | ▒ | ├ | ╙ | π | ≤ |
| 4 | ♦ | ¶ | $ | 4 | D | T | d | t | ä | ö | ñ | ▒ | ─ | ╘ | Σ | ⌠ |
| 5 | ♣ | § | % | 5 | E | U | e | u | à | ò | Ñ | ▒ | ┼ | ╒ | σ | ⌡ |
| 6 | ♠ | ▬ | & | 6 | F | V | f | v | å | û | ª | ▒ | ╞ | ╓ | μ | ÷ |
| 7 | • | ↨ | ' | 7 | G | W | g | w | ç | ù | º | ▒ | ╟ | ╫ | τ | ≈ |
| 8 | ◘ | ↑ | ( | 8 | H | X | h | x | ê | ÿ | ¿ | ▒ | ╚ | ╪ | Φ | ° |
| 9 | ○ | ↓ | ) | 9 | I | Y | i | y | ë | Ö | ⌐ | ▒ | ╔ | ┘ | Θ | ● |
| A | ◙ | → | * | : | J | Z | j | z | è | Ü | ¬ | ▒ | ╩ | ┌ | Ω | · |
| B | ♂ | ← | + | ; | K | [ | k | { | ï | ¢ | ½ | ▒ | ╦ | ▒ | δ | √ |
| C | ♀ | ∟ | , | < | L | \ | l | \| | î | £ | ¼ | ▒ | ╠ | ▬ | ∞ | η |
| D | ♪ | ↔ | - | = | M | ] | m | } | ì | ¥ | ¡ | ▒ | ═ | ▒ | ϕ | 2 |
| E | ♫ | ▲ | . | > | N | ^ | n | ~ | Ä | Pt | « | ▒ | ╬ | ▒ | ε | ■ |
| F | ☼ | ▼ | / | ? | O | _ | o | ▓ | Å | *f* | » | ▒ | ╧ | ▬ | ∩ | |

**Note:** The PC-8 symbol set meets the 95-character ASCII subset of FIPS.

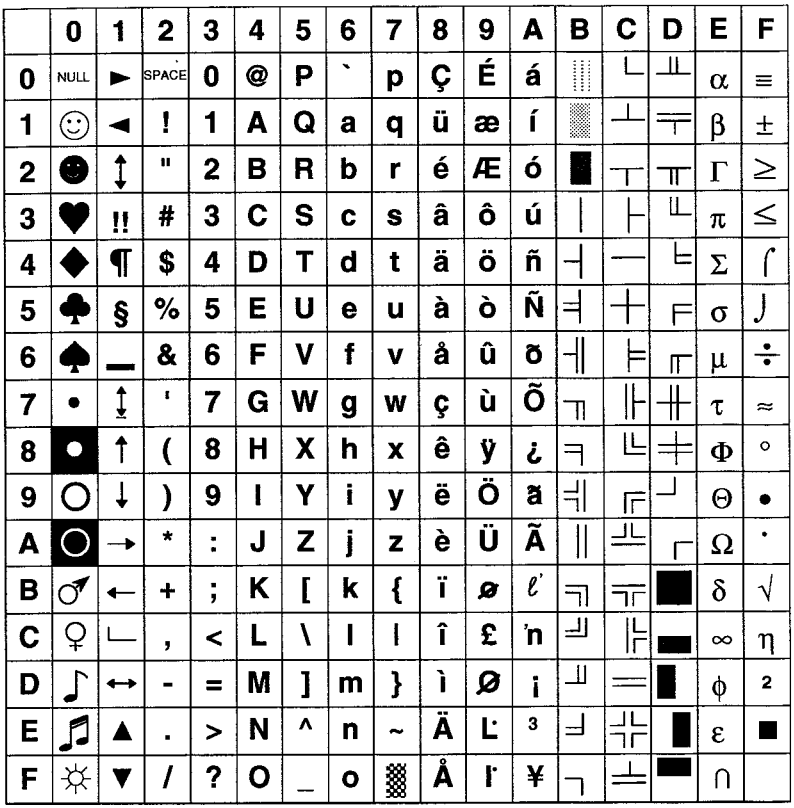
# Roman-8 Symbol Set

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | SPACE | 0 | @ | P | ` | p | | | | — | â | Å | Á | Þ |
| 1 | | | ! | 1 | A | Q | a | q | | | À | Ý | ê | î | Ã | þ |
| 2 | | | " | 2 | B | R | b | r | | | Â | ý | ô | Ø | ã | · |
| 3 | | | # | 3 | C | S | c | s | | | È | ° | û | Æ | Ð | µ |
| 4 | | | $ | 4 | D | T | d | t | | | Ê | Ç | á | å | ð | ¶ |
| 5 | | | % | 5 | E | U | e | u | | | Ë | ç | é | í | Í | ¾ |
| 6 | | | & | 6 | F | V | f | v | | | Î | Ñ | ó | ø | Ì | — |
| 7 | | | ' | 7 | G | W | g | w | | | Ï | ñ | ú | æ | Ó | ¼ |
| 8 | | | ( | 8 | H | X | h | x | | | ´ | ¡ | à | Ä | Ò | ½ |
| 9 | | | ) | 9 | I | Y | i | y | | | ` | ¿ | è | ì | Õ | ª |
| A | | | * | : | J | Z | j | z | | | ^ | ¤ | ò | Ö | õ | º |
| B | | | + | ; | K | [ | k | { | | | ¨ | £ | ù | Ü | Š | « |
| C | | | , | < | L | \ | l | \| | | | ~ | ¥ | ä | É | š | ■ |
| D | | | - | = | M | ] | m | } | | | Ú | § | ë | ï | Ú | » |
| E | | | . | > | N | ^ | n | ~ | | | Û | *f* | ö | ß | Ÿ | ± |
| F | | | / | ? | O | _ | o | ▒ | | | £ | ¢ | ü | Ó | ÿ | |

# Roman Extension Symbol Set

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | — | â | Å | Á | Þ |
| 1 | | | À | Ý | ê | î | Ã | þ |
| 2 | | | Â | ý | ô | Ø | ã | · |
| 3 | | | È | ° | û | Æ | Ð | µ |
| 4 | | | Ê | Ç | á | å | ð | ¶ |
| 5 | | | Ë | ç | é | í | Í | ¾ |
| 6 | | | Î | Ñ | ó | ø | Ì | ‗ |
| 7 | | | Ï | ñ | ú | æ | Ó | ¼ |
| 8 | | | ´ | ¡ | à | Ä | Ò | ½ |
| 9 | | | ` | ¿ | è | ì | Õ | ª |
| A | | | ˆ | ¤ | ò | Ö | õ | º |
| B | | | ¨ | £ | ù | Ü | Š | « |
| C | | | ~ | ¥ | ä | É | š | ■ |
| D | | | Ú | § | ë | ï | Ú | » |
| E | | | Û | *f* | ö | ß | Ÿ | ± |
| F | | | £ | ¢ | ü | Ó | ÿ | |

# PC-8 DN Symbol Set



# PC-850 Symbol Set

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | NULL | ► | SPACE | 0 | @ | P | ` | p | Ç | É | á | ⣿ | └ | ð | Ó | – |
| 1 | ☺ | ◄ | ! | 1 | A | Q | a | q | ü | æ | í | ▒ | ┴ | Ð | β | ± |
| 2 | ☻ | ↕ | " | 2 | B | R | b | r | é | Æ | ó | ▉ | ┬ | Ê | Ô | ‗ |
| 3 | ♥ | ‼ | # | 3 | C | S | c | s | â | ô | ú | │ | ├ | Ë | Ò | ¾ |
| 4 | ♦ | ¶ | $ | 4 | D | T | d | t | ä | ö | ñ | ┤ | — | È | õ | ¶ |
| 5 | ♣ | § | % | 5 | E | U | e | u | à | ò | Ñ | Á | ┼ | ı | Õ | § |
| 6 | ♠ | ▬ | & | 6 | F | V | f | v | å | û | ª | Â | ã | Í | µ | ÷ |
| 7 | • | ↨ | ' | 7 | G | W | g | w | ç | ù | º | À | Ã | Î | Þ | ¸ |
| 8 | ◘ | ↑ | ( | 8 | H | X | h | x | ê | ÿ | ¿ | © | ╚ | Ï | þ | ° |
| 9 | ○ | ↓ | ) | 9 | I | Y | i | y | ë | Ö | ® | ╣ | ╔ | ┘ | Ú | ¨ |
| A | ◙ | → | * | : | J | Z | j | z | è | Ü | ¬ | ╠ | ╩ | ┌ | Û | · |
| B | ♂ | ← | + | ; | K | [ | k | { | ï | ø | ½ | ╗ | ╦ | ▉ | Ù | ¹ |
| C | ♀ | ∟ | , | < | L | \ | l | \| | î | £ | ¼ | ╝ | ╠ | ▬ | ý | ³ |
| D | ♪ | ↔ | - | = | M | ] | m | } | ì | Ø | ¡ | ¢ | ═ | ¦ | Ý | ² |
| E | ♫ | ▲ | . | > | N | ^ | n | ~ | Ä | × | « | ¥ | ╬ | ì | ¯ | ■ |
| F | ☼ | ▼ | / | ? | O | _ | o | ⌂ | Å | ƒ | » | ┐ | ¤ | ▬ | ´ | |

# ECMA-94 Symbol Set

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | SPACE | 0 | @ | P | ` | p | | | | ° | À | Ð | à | ð |
| 1 | | | ! | 1 | A | Q | a | q | | | ¡ | ± | Á | Ñ | á | ñ |
| 2 | | | " | 2 | B | R | b | r | | | ¢ | ² | Â | Ò | â | ò |
| 3 | | | # | 3 | C | S | c | s | | | £ | ³ | Ã | Ó | ã | ó |
| 4 | | | $ | 4 | D | T | d | t | | | ¤ | ´ | Ä | Ô | ä | ô |
| 5 | | | % | 5 | E | U | e | u | | | ¥ | µ | Å | Õ | å | õ |
| 6 | | | & | 6 | F | V | f | v | | | ¦ | ¶ | Æ | Ö | æ | ö |
| 7 | | | ' | 7 | G | W | g | w | | | § | · | Ç | × | ç | ÷ |
| 8 | | | ( | 8 | H | X | h | x | | | ¨ | ¸ | È | Ø | è | ø |
| 9 | | | ) | 9 | I | Y | i | y | | | © | ¹ | É | Ù | é | ù |
| A | | | * | : | J | Z | j | z | | | ª | º | Ê | Ú | ê | ú |
| B | | | + | ; | K | [ | k | { | | | « | » | Ë | Û | ë | û |
| C | | | , | < | L | \ | l | \| | | | ¬ | ¼ | Ì | Ü | ì | ü |
| D | | | - | = | M | ] | m | } | | | - | ½ | Í | Ý | í | ý |
| E | | | . | > | N | ^ | n | ~ | | | ® | ¾ | Î | Þ | î | þ |
| F | | | / | ? | O | _ | o | ▒ | | | ¯ | ¿ | Ï | ß | ï | ÿ |

# Legal and International Symbol Sets

The Legal and ISO symbol sets use the standard 96-character ASCII symbol set as a basis, modifying only a few of the symbols to satisfy the specific needs of the user. The following table shows the varying characters in these symbol sets.

| Symbol Set | | Hexadecimal Value | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | Name | 23 | 24 | 40 | 5B | 5C | 5D | 5E | 60 | 7B | 7C | 7D | 7E |
| 6 | ASCII | # | $ | @ | [ | \ | ] | ^ | ` | { | \| | } | ~ |
| 2 | ISO IRV | # | ¤ | @ | [ | \ | ] | ^ | ` | { | \| | } | ¯ |
| 4 | ISO United Kingdom | £ | $ | @ | [ | \ | ] | ^ | ` | { | \| | } | ¯ |
| 25 | ISO French | £ | $ | à | ° | ç | § | ^ | ` | é | ù | è | ¨ |
| 69 | ISO French | £ | $ | à | ° | ç | § | ^ | µ | é | ù | è | ¨ |
| | German | £ | $ | § | Ä | Ö | Ü | ^ | ` | ä | ö | ü | ß |
| 21 | ISO German | # | $ | § | Ä | Ö | Ü | ^ | ` | ä | ö | ü | ß |
| 15 | ISO Italian | £ | $ | § | ° | ç | é | ^ | ù | à | ò | è | ì |
| 14 | JIS ASCII | # | $ | @ | [ | ¥ | ] | ^ | ` | { | \| | } | ¯ |
| 57 | ISO Chinese | # | ¥ | @ | [ | \ | ] | ^ | ` | { | \| | } | ¯ |
| 10 | ISO Swedish | # | ¤ | @ | Ä | Ö | Å | ^ | ` | ä | ö | å | ¯ |
| 11 | ISO Swedish | # | ¤ | É | Ä | Ö | Å | Ü | é | ä | ö | å | ü |
| | Spanish | # | $ | @ | ¡ | Ñ | ¿ | ° | ` | { | ñ | } | ~ |
| 17 | ISO Spanish | £ | $ | § | ¡ | Ñ | ¿ | ^ | ` | ° | ñ | ç | ~ |
| 85 | ISO Spanish: IBM | # | $ | · | ¡ | Ñ | Ç | ¿ | ` | ´ | ñ | ç | ¨ |
| 16 | ISO Portuguese | # | $ | § | Ã | Ç | Õ | ^ | ` | ã | ç | õ | ° |
| 84 | ISO Portuguese | # | $ | ´ | Ã | Ç | Õ | ^ | ` | ã | ç | õ | ~ |
| 60 | ISO Norwegian v1 | # | $ | @ | Æ | Ø | Å | ^ | ` | æ | ø | å | ¯ |
| 61 | ISO Norwegian v2 | § | $ | @ | Æ | Ø | Å | ^ | ` | æ | ø | å | \| |
| | Legal | # | $ | @ | [ | ® | ] | © | ° | § | ¶ | † | ™ |

# D
# HPII Emulator Control Codes and Escape Sequences

This appendix is provided as a reference for people with experience in configuring printers. The *microLaser Family Laser Printers Technical Reference Manual* describes in detail how to use these control codes and escape sequences.

# HPII Emulator Control Codes

The HPII emulator recognizes the following control codes.

| ASCII Value | Mnemonic | Function |
|---|---|---|
| 08H | BS | Backspaces one logical print position. This is the horizontal motion index (HMI) for a fixed pitch font or the width of the last printed character for a proportional font. |
| 09H | HT | Moves to the next horizontal tab stop. Horizontal tab stops are located at the left margin and at every eighth column to the right of the left margin. |
| 0AH | LF | Moves the logical position down one line on the page.* |
| 0CH | FF | Prints the currently buffered page and resets the logical position to top left margin for the next page.* |
| 0DH | CR | Returns logical position to left margin.* |
| 0EH | SO | Selects secondary font. |
| 0FH | SI | Selects primary font. |
| 1BH | ESC | Signals the beginning of a printer command. |

* Function can be changed with line termination command.

# Issuing Escape Sequences

In the following escape sequences, *N* in the format refers to values expressed in ASCII form. For example, a value of 30 is expressed as a hexadecimal value of 33H 30H.

The printer executes some escape sequences by switching to a different font. If the font required to execute the escape sequence is not present, the printer either ignores the escape sequence or selects the font that most closely matches the requested font. Since the printer has several resident fonts, some of the escape sequences that require an external font on the HP LaserJet series II printer can be performed without external fonts.

If the first two characters following the ESC character are the same, you can combine several escape sequences into an escape sequence string. To create an escape sequence string, follow these steps.

1. Type the ESC character and the first two characters in the escape sequence.

2. Type the rest of the characters for the first escape sequence, converting the final uppercase character to lowercase. This lowercase character signals that the next characters are part of an escape sequence string.

3. Add escape sequences to the escape sequence string in the order you want the printer to execute them. Type only the characters following the first two common characters. Convert the final uppercase character to lowercase for all escape sequences except the last escape sequence in the escape sequence string.

## Example

The following escape sequences set a left margin of 10 characters and a right margin of 70 characters.

```
ESC & a 1 0 L                (1B 26 61 31 30 4C)
ESC & a 7 0 M                (1B 26 61 37 30 4D)
```

You can combine these two escape sequences into the following escape sequence string.

```
ESC & a 1 0 l 7 0 M (1B 26 61 31 30 6C 37 30 4D)
```

**Note:** The commands related to primary and secondary font selection require the presence of the requested font on the system, either a resident font, an external font in a font card, or a downloaded font. If the requested font is not available, the printer selects the font that most closely matches the requested font.

# HPII Emulator Escape Sequences

The following escape sequences are active during the HPII emulator. The printer accepts but ignores all two-character escape sequences not included in this chart.

| Command | Parameter | Format | Hex | Range | Notes |
|---|---|---|---|---|---|
| **Primary Font Selection** | | | | | |
| Primary symbol set | Roman-8 | ESC ( 8 U | 1B 28 38 55 | | |
| | ECMA-94 | ESC ( 0 N | 1B 28 30 4E | | |
| | PC-8 | ESC ( 1 0 U | 1B 28 31 30 55 | | |
| | PC-8 DN | ESC ( 1 1 U | 1B 28 31 31 55 | | |
| | PC-850 | ESC ( 1 2 U | 1B 28 31 32 55 | | |
| | ISO-2 | ESC ( 2 U | 1B 28 32 55 | | |
| | ISO-4 | ESC ( 1 E | 1B 28 31 45 | | |
| | ISO-6 | ESC ( 0 U | 1B 28 30 55 | | |
| | ISO-10 | ESC ( 3 S | 1B 28 33 53 | | |
| | ISO-11 | ESC ( 0 S | 1B 28 30 53 | | |
| | ISO-14 | ESC ( 0 K | 1B 28 30 4B | | |
| | ISO-15 | ESC ( 0 I | 1B 28 30 49 | | |
| | ISO-16 | ESC ( 4 S | 1B 28 34 53 | | |
| | ISO-17 | ESC ( 2 S | 1B 28 32 53 | | |
| | ISO-21 | ESC ( 1 G | 1B 28 31 47 | | |
| | ISO-25 | ESC ( 0 F | 1B 28 30 46 | | |
| | ISO-57 | ESC ( 2 K | 1B 28 32 4B | | |
| | ISO-60 | ESC ( 0 D | 1B 28 30 44 | | |
| | ISO-61 | ESC ( 1 D | 1B 28 31 44 | | |
| | ISO-69 | ESC ( 1 F | 1B 28 31 46 | | |
| | ISO-84 | ESC ( 5 S | 1B 28 35 53 | | |
| | ISO-85 | ESC ( 6 S | 1B 28 36 53 | | |
| | German | ESC ( 0 G | 1B 28 30 47 | | |
| | Spanish | ESC ( 1 S | 1B 28 31 53 | | |
| | Legal | ESC ( 1 U | 1B 28 31 55 | | |
| | Roman Ext. | ESC ( 0 E | 1B 28 30 45 | | |
| Primary proportional | | ESC ( s 1 P | 1B 28 73 31 50 | | Ignored if proportional not available |
| Primary fixed | | ESC ( s 0 P | 1B 28 73 30 50 | | |
| Primary pitch | 10 cpi | ESC ( s 1 0 H | 1B 28 73 31 30 48 | any no. | Ignored if proportional font |
| | 12 cpi | ESC ( s 1 2 H | 1B 28 73 31 32 48 | | |
| | 16.66 cpi | ESC ( s 1 6 . 6 6 H | 1B 28 73 31 36 2E 36 36 48 | | |
| Primary point size | 8.5 pt. | ESC ( s 8 . 5 V | 1B 28 73 38 2E 35 56 | any no. | |
| | 10 pt. | ESC ( s 1 0 V | 1B 28 73 31 30 56 | | |
| | 12 pt. | ESC ( s 1 2 V | 1B 28 73 31 32 56 | | |
| Primary style | Upright | ESC ( s 0 S | 1B 28 73 30 53 | | |
| | Italic | ESC ( s 1 S | 1B 28 73 31 53 | | |
| Primary weight | Light | ESC ( s -3 B | 1B 28 73 2D 33 42 | (–7) – (–1) | |
| | Medium | ESC ( s 0 B | 1B 28 73 30 42 | 0 | |
| | Heavy | ESC ( s 3 B | 1B 28 73 33 42 | 1 – 7 | |
| Primary typeface | Line printer | ESC ( s 0 T | 1B 28 73 30 54 | | |
| | Courier | ESC ( s 3 T | 1B 28 73 33 54 | | |

# HPII Emulator Escape Sequences

| Command | Parameter | Format | Hex | Range | Notes |
|---|---|---|---|---|---|
| **Secondary Font Selection** | | | | | |
| Secondary symbol set | Roman-8 | ESC ) 8 U | 1B 29 38 55 | | |
| | ECMA-94 | ESC ) 0 N | 1B 29 30 4E | | |
| | PC-8 | ESC ) 1 0 U | 1B 29 31 30 55 | | |
| | PC-8 DN | ESC ) 1 1 U | 1B 29 31 31 55 | | |
| | PC-850 | ESC ) 1 2 U | 1B 29 31 32 55 | | |
| | ISO-2 | ESC ) 2 U | 1B 29 32 55 | | |
| | ISO-4 | ESC ) 1 E | 1B 29 31 45 | | |
| | ISO-6 | ESC ) 0 U | 1B 29 30 55 | | |
| | ISO-10 | ESC ) 3 S | 1B 29 33 53 | | |
| | ISO-11 | ESC ) 0 S | 1B 29 30 53 | | |
| | ISO-14 | ESC ) 0 K | 1B 29 30 4B | | |
| | ISO-15 | ESC ) 0 I | 1B 29 30 49 | | |
| | ISO-16 | ESC ) 4 S | 1B 29 34 53 | | |
| | ISO-17 | ESC ) 2 S | 1B 29 32 53 | | |
| | ISO-21 | ESC ) 1 G | 1B 29 31 47 | | |
| | ISO-25 | ESC ) 0 F | 1B 29 30 46 | | |
| | ISO-57 | ESC ) 2 K | 1B 29 32 4B | | |
| | ISO-60 | ESC ) 0 D | 1B 29 30 44 | | |
| | ISO-61 | ESC ) 1 D | 1B 29 31 44 | | |
| | ISO-69 | ESC ) 1 F | 1B 29 31 46 | | |
| | ISO-84 | ESC ) 5 S | 1B 29 35 53 | | |
| | ISO-85 | ESC ) 6 S | 1B 29 36 53 | | |
| | German | ESC ) 0 G | 1B 29 30 47 | | |
| | Spanish | ESC ) 1 S | 1B 29 31 53 | | |
| | Legal | ESC ) 1 U | 1B 29 31 55 | | |
| | Roman Ext. | ESC ) 0 E | 1B 28 30 45 | | |
| Secondary style | Upright | ESC ) s 0 S | 1B 29 73 30 53 | | |
| | Italic | ESC ) s 1 S | 1B 29 73 31 53 | | |
| Secondary weight | Light | ESC ) s -3 B | 1B 29 73 2D 33 42 | (–7 ) – (–1) | |
| | Medium | ESC ) s 0 B | 1B 29 73 30 42 | 0 | |
| | Heavy | ESC ) s 3 B | 1B 29 73 33 42 | 1 – 7 | |
| Secondary pitch | 10 cpi | ESC ) s 1 0 H | 1B 29 73 31 30 48 | any no. | Ignored if proportional font |
| | 12 cpi | ESC ) s 1 2 H | 1B 29 73 31 32 48 | | |
| | 16.66 cpi | ESC ) s 1 6 . 6 6 H | 1B 29 73 31 36 2E 36 36 48 | | |
| Secondary proportional | | ESC ) s 1 P | 1B 29 73 31 50 | | Ignored if proportional not available |
| Secondary fixed | | ESC ) s 0 P | 1B 29 73 30 50 | | |
| Secondary point size | 8.5 pt. | ESC ) s 8 . 5 V | 1B 29 73 38 2E 35 56 | any no. | |
| | 10 pt. | ESC ) s 1 0 V | 1B 29 73 31 30 56 | any no. | |
| | 12 pt. | ESC ) s 1 2 V | 1B 29 73 31 32 56 | | |
| Secondary typeface | Line printer | ESC ) s 0 T | 1B 29 73 30 54 | | |
| | Courier | ESC ) s 3 T | 1B 29 73 33 54 | | |

# HPII Emulator Escape Sequences

| Command | Parameter | Format | Hex | Range | Notes |
|---|---|---|---|---|---|
| **Line spacing** | | | | | |
| LPI | 1 lpi | ESC & l 1 D | 1B 26 6C 31 44 | | |
| | 2 lpi | ESC & l 2 D | 1B 26 6C 32 44 | | |
| | 3 lpi | ESC & l 3 D | 1B 26 6C 33 44 | | |
| | 4 lpi | ESC & l 4 D | 1B 26 6C 34 44 | | |
| | 6 lpi | ESC & l 6 D | 1B 26 6C 36 44 | | |
| | 8 lpi | ESC & l 8 D | 1B 26 6C 38 44 | | |
| | 12 lpi | ESC & l 1 2 D | 1B 26 6C 31 32 44 | | |
| | 16 lpi | ESC & l 1 6 D | 1B 26 6C 31 36 44 | | |
| | 24 lpi | ESC & l 2 4 D | 1B 26 6C 32 34 44 | | |
| | 48 lpi | ESC & l 4 8 D | 1B 26 6C 34 38 44 | | |
| Half-line feed (subscript) | | ESC = | 1B 3D | | |
| **Horizontal and vertical motion indexes** | | | | | |
| HMI | 1/120 inch increments | ESC & k *N* H | 1B 26 6B ... 48 | 0 – 126 | |
| VMI | 1/48 in. increments | ESC & l *N* C | 1B 26 6C ... 43 | | |
| **Margins and page formatting** | | | | | |
| Paper size | Executive | ESC & l 1 A | 1B 26 6C 31 41 | | Defines image area |
| | Letter | ESC & l 2 A | 1B 26 6C 32 41 | | |
| | Legal | ESC & l 3 A | 1B 26 6C 33 41 | | |
| | A4 | ESC & l 2 6 A | 1B 26 6C 32 36 41 | | |
| | Monarc | ESC & l 8 0 A | 1B 26 6C 38 30 41 | | |
| | Comm. 10 | ESC & l 8 1 A | 1B 26 6C 38 31 41 | | |
| | DL | ESC & l 9 0 A | 1B 26 6C 39 30 41 | | |
| | C5 | ESC & l 9 1 A | 1B 26 6C 39 31 41 | | |
| Page length | Current lines | ESC & l *N* P | 1B 26 6C ... 50 | physical page | Sets VMI based on curren image area |
| Top margin | Lines to skip | ESC & l *N* E | 1B 26 6C ... 45 | | Uses current VMI to determine position |
| Text length | Lines | ESC & l *N* F | 1B 26 6C ... 46 | | Uses current VMI to determine length |
| Left margin | Column no. | ESC & a *N* L | 1B 26 61 ... 4C | | |
| Right margin | Column no. | ESC & a *N* M | 1B 26 61 ... 4D | | Measured from position 0, not from left margin |
| Clear left and right margins | | ESC 9 | 1B 39 | | |
| **Cursor positioning** | | | | | |
| Absolute horiz. position | Column number | ESC & a *N* C | 1B 26 61 ... 43 | | |
| | 1/720 inch increments | ESC & a *N* H | 1B 26 61 ... 48 | | |
| | Dots | ESC * p *N* X | 1B 2A 70 ... 58 | | |
| Relative horiz. position | Columns left | ESC & a - *N* C | 1B 26 61 2D ... 43 | | Measured from current cursor position |
| | Columns right | ESC & a + *N* C | 1B 26 61 2B ... 43 | | |
| | Increments left | ESC & a - *N* H | 1B 26 61 2D ... 48 | | |
| | Increments rt. | ESC & a + *N* H | 1B 26 61 2B ... 48 | | |
| | Dots left | ESC * p - *N* X | 1B 2A 70 2D ... 58 | | |
| | Dots right | ESC * p + *N* X | 1B 2A 70 2B ... 58 | | |

# HPII Emulator Escape Sequences

| Command | Parameter | Format | Hex | Range | Notes |
|---|---|---|---|---|---|
| Absolute vertical position | Row number | ESC & a *N* R | 1B 26 61 ... 52 | | Position based on current line spacing |
| | 1/720 inch increments | ESC & a *N* V | 1B 26 61 ... 56 | | |
| | Dots | ESC * p *N* Y | 1B 2A 70 ... 59 | | |
| Relative vertical position | Lines up page | ESC & a - *N* R | 1B 26 61 2D ... 52 | | Measured from current cursor position |
| | Lines dn. page | ESC & a + *N* R | 1B 26 61 2B ... 52 | | |
| | Increments up | ESC & a - *N* V | 1B 26 61 2D ... 56 | | |
| | Increments dn. | ESC & a + *N* V | 1B 26 61 2B ... 56 | | |
| | Dots up | ESC * p - *N* Y | 1B 2A 70 2D ... 59 | | |
| | Dots down | ESC * p + *N* Y | 1B 2A 70 2B ... 59 | | |
| Store cursor position | | ESC & f 0 S | 1B 26 66 30 53 | | Maximum 20 positions |
| Recall cursor position | | ESC & f 1 S | 1B 26 66 31 53 | | Recalls last stored position |
| **Special print features** | | | | | |
| Underscore | Start fixed | ESC & d D | 1B 26 64 44 | | |
| | Start floating | ESC & d 3 D | 1B 26 64 33 44 | | |
| | Stop | ESC & d @ | 1B 26 64 40 | | |
| Bold | (See weight) | | | | |
| End of line wrap | On | ESC & s 0 C | 1B 26 73 30 43 | | |
| | Off | ESC & s 1 C | 1B 26 73 31 43 | | |
| Print control characters | Bytes to print | ESC & p *N* X [*data*] | 1B 26 70 ... 58 [*data*] | any no. | |
| **Miscellaneous** | | | | | |
| Page orientation | Portrait | ESC & l 0 O | 1B 26 6C 30 4F | | Ejects page if data present |
| | Landscape | ESC & l 1 O | 1B 26 6C 31 4F | | |
| Eject curr. page | | ESC & l 0 H | 1B 26 6C 30 48 | | Ignored if empty page |
| Paper input | Standard tray | ESC & l 1 H | 1B 26 6C 31 48 | | |
| | Manual feed | ESC & l 2 H | 1B 26 6C 32 48 | | |
| | Manual feed envelope | ESC & l 3 H | 1B 26 6C 33 48 | | |
| | Optional paper feeder | ESC & l 4 H | 1B 26 6C 34 48 | | Ignored if option not installed |
| | Envelope feeder | ESC & l 6 H | 1B 26 6C 36 48 | | Ignored if option not installed |
| Perforation skip | On | ESC & l 1 L | 1B 26 6C 31 4C | | |
| | Off | ESC & l 0 L | 1B 26 6C 30 4C | | |
| Number of copies | | ESC & l *N* X | 1B 26 6C ... 58 | 1 – 99 | Affects current page and all following pages |
| Line termination | CR=CR; LF=LF FF=FF | ESC & k 0 G | 1B 26 6B 30 47 | | |
| | CR=CR+LF LF=LF; FF=FF | ESC & k 1 G | 1B 26 6B 31 47 | | |
| | CR=CR LF=CR+LF FF=CR+FF | ESC & k 2 G | 1B 26 6B 32 47 | | |
| | CR=CR+LF LF=CR+LF FF=CR+FF | ESC & k 3 G | 1B 26 6B 33 47 | | |
| Software reset | | ESC E | 1B 45 | | |

# HPII Emulator Escape Sequences

| Command | Parameter | Format | Hex | Range | Notes |
|---|---|---|---|---|---|
| **Raster Graphics** | | | | | |
| Set raster graph. resolution | 75 dots/in | ESC * t 7 5 R | 1B 2A 74 37 35 52 | | |
| | 100 dots/in | ESC * t 1 0 0 R | 1B 2A 74 31 30 30 52 | | |
| | 150 dots/in | ESC * t 1 5 0 R | 1B 2A 74 31 35 30 52 | | |
| | 300 dots/in | ESC * t 3 0 0 R | 1B 2A 74 33 30 30 52 | | |
| Start raster graphics | Position 0 | ESC * r 0 A | 1B 2A 72 30 41 | | Starts at left-most print position regardless of left margin |
| | Current pos. | ESC * r 1 A | 1B 2A 72 31 41 | | Starts at current logical position |
| End raster graphics | | ESC * r B | 1B 2A 72 42 | | |
| Transfer raster graphics | Bytes | ESC * b *N* W [*data*] | 1B 2A 62 ... 57 [*data*] | | Specifies number of bytes in 1-dot horiz. row of raster graphics; repeated for each row |
| **Rules** | | | | | |
| Define horiz. rule | Dots | ESC * c *N* A | 1B 2A 63 ... 41 | | |
| | Decipoints | ESC * c *N* H | 1B 2A 63 ... 48 | | |
| Define vert. rule | Dots | ESC * c *N* B | 1B 2A 63 ... 42 | | |
| | Decipoints | ESC * c *N* V | 1B 2A 63 ... 56 | | |
| Print rule | Black | ESC * c 0 P | 1B 2A 63 30 50 | | |
| | Gray | ESC * c 2 P | 1B 2A 63 32 50 | | |
| | Pattern | ESC * c 3 P | 1B 2A 63 33 50 | | |
| Define gray scale | % of black | ESC * c *N* G | 1B 2A 63 ... 47 | 1 – 100 | |
| Define pattern | Horiz. lines | ESC * c 1 G | 1B 2A 63 31 47 | | |
| | Vert. lines | ESC * c 2 G | 1B 2A 63 32 47 | | |
| | Diag. lines | ESC * c 3 G | 1B 2A 63 33 47 | | |
| | Diag. lines | ESC * c 4 G | 1B 2A 63 34 47 | | |
| | Crosshatch | ESC * c 5 G | 1B 2A 63 35 47 | | |
| | Diag. crosshatch | ESC * c 6 G | 1B 2A 63 36 47 | | |
| **Macros** | | | | | |
| Macro ID | Unique no. | ESC & f *N* Y | 1B 26 66 ... 59 | 0 – 32767 | up to 32 macros at one time |
| Macro control | Start macro definition | ESC & f 0 X | 1B 26 66 30 59 | | |
| | Stop macro def. | ESC & f 1 X | 1B 26 66 31 59 | | |
| | Execute macro | ESC & f 2 X | 1B 26 66 32 59 | | |
| | Call macro | ESC & f 3 X | 1B 26 66 33 59 | | |
| | Auto overlay on | ESC & f 4 X | 1B 26 66 34 59 | | |
| | Auto overlay off | ESC & f 5 X | 1B 26 66 35 59 | | |
| | Del. all macros | ESC & f 6 X | 1B 26 66 36 59 | | |
| | Del. temp. macros | ESC & f 7 X | 1B 26 66 37 59 | | |
| | Delete ID macro | ESC & f 8 X | 1B 26 66 38 59 | | |
| | Make temp. | ESC & f 9 X | 1B 26 66 39 59 | | |
| | Make perm. | ESC & f 1 0 X | 1B 26 66 31 30 59 | | |

# HPII Emulator Escape Sequences

| Command | Parameter | Format | Hex | Range | Notes |
|---|---|---|---|---|---|
| **Font Management** | | | | | |
| Font ID | Unique no. | ESC * c *N* D | 1B 2A 63 ... 44 | | No more than 32 fonts at one time |
| Character ID | Decimal value | ESC * c *N* E | 1B 2A 63 ... 45 | 0 – 255 | |
| Font descriptor | No. of bytes | ESC ) s *N* W [*data*] | 1B 29 73 ... 57 [*data*] | | Sequence followed by data |
| Character descriptor | No. of bytes | ESC ( s *N* W [*data*] | 1B 28 73 ... 57 [*data*] | | Sequence followed by data |
| Font/char control | Delete all fonts | ESC * c 0 F | 1B 2A 63 30 46 | | |
| | Del. temp. fonts | ESC * c 1 F | 1B 2A 63 31 46 | | |
| | Delete ID font | ESC * c 2 F | 1B 2A 63 32 46 | | |
| | Delete ID font/char | ESC * c 3 F | 1B 2A 63 33 46 | | Deleted character cannot be replaced |
| | Make font temp. | ESC * c 4 F | 1B 2A 63 34 46 | | |
| | Make font perm. | ESC * c 5 F | 1B 2A 63 35 46 | | |
| | Copy font | ESC * c 6 F | 1B 2A 63 36 46 | | |
| Designate download font | Primary font ID | ESC ( *N* X | 1B 28 ... 58 | | |
| | Second. font ID | ESC ) *N* X | 1B 29 ... 58 | | |
| Primary font default | Use default symbol set | ESC ( 0 @ | 1B 28 30 40 | | |
| | Use def. prim. symbol set | ESC ( 1 @ | 1B 28 31 40 | | |
| | Use curr. prim. symbol set | ESC ( 2 @ | 1B 28 32 40 | | |
| | Set parms. to def. prim. font | ESC ( 3 @ | 1B 28 33 40 | | |
| Secondary font default | Use default symbol set | ESC ) 0 @ | 1B 29 30 40 | | |
| | Use def. prim. symbol set | ESC ) 1 @ | 1B 29 31 40 | | |
| | Use curr. prim. symbol set | ESC ) 2 @ | 1B 29 32 40 | | |
| | Set parms. to def. sec. font | ESC ) 3 @ | 1B 29 33 40 | | |

# HPII Font Selection Hierarchy

The HPII emulator selects fonts based on escape sequences that describe the font. If a font that exactly matches the requested characteristics is unavailable, the printer selects a font with similar characteristics using the following hierarchy of selection characteristics, listed in descending order of priority.

- Orientation (portrait or landscape)
- Symbol set (Roman-8, Linedraw, etc.)
- Spacing (proportional or fixed)
- Pitch (fixed spacing only)
- Point size
- Style (upright or italic)
- Weight (light, medium, heavy)
- Typeface (Courier, Times, Helvetica, etc.)

Always issue the escape sequences in this order to ensure that you select the correct font. Since fonts *do not* have a complete typeface family, request only those characteristics that are available. The font selection hierarchy applies equally to resident, external, or downloaded fonts.

**Note:** The printer can generate slanted (italic) fonts from upright fonts. The printer generates a slanted font when you have requested italic style which is unavailable in the font that most closely matches the requested font. The generated slanted font is different from a true italic font but should serve as an acceptable substitute in most circumstances.

# HPII Font Selection Hierarchy

The following shows how the HPII emulator selects fonts.

The emulator selects fonts with the specified orientation. Since the printer can rotate any font from portrait to landscape orientation and vice versa, the printer selects all available fonts.

If any font with the correct orientation has the specified symbol set, the emulator selects those fonts; otherwise, the emulator uses the current symbol set.

If proportional spacing is selected and proportional fonts remain, the emulator selects those fonts; otherwise, the emulator uses the current fixed-pitch font.

If a fixed-pitch font is specified and fonts with the specified pitch remain, the emulator selects those fonts; otherwise, the emulator selects the next higher pitch (smaller character size) if available or the next smaller pitch (larger character size) if no higher pitch is available.

If proportional is selected and available, the emulator selects the closest point size from the remaining fonts. Point sizes within a quarter point are considered to match. If a matching font is not found, the emulator selects the font with the next closest point size, either larger or smaller.

If the specified style is available among the remaining fonts, the emulator selects that style; otherwise, the emulator ignores the style.

If the specified weight is available among the remaining fonts, the emulator selects that weight; otherwise, the emulator selects the next thicker weight if the specified weight is 0 or greater and the next thinner weight if the specified weight is less than 0. If no such font exists, the emulator selects the font with the closest weight.

If the specified typeface is available in the remaining fonts, the emulator selects the typeface; otherwise, the emulator ignores the request. If more than one of the remaining fonts has the requested typeface, the emulator selects a downloaded font first, then a font from a font card, and finally a resident font.

# E
# Using Global Commands

Global commands extend the capability of *microLaser* printers by giving you commands unavailable in the emulated printers.

## PostScript Global Commands

The following global commands are available while the printer is running the PostScript interpreter. To issue global commands, send the escape sequences at the beginning of a print job *before* sending other characters.

| Command | Parameter | Format | Hex | Notes |
|---|---|---|---|---|
| Personal Prt | 1 | ESC DLE ! | 1B 10 21 | Non-Turbo printers only |
| | 2 | ESC DLE @ | 1B 10 22 | Non-Turbo printers only |
| | 3 | ESC DLE # | 1B 10 23 | Non-Turbo printers only |
| | 4 | ESC DLE $ | 1B 10 24 | Non-Turbo printers only |
| Emulation | PS batch | ESC DLE 0 | 1B 10 30 | |
| | Diablo | ESC DLE 1 | 1B 10 31 | Requires emulator card |
| | Proprinter | ESC DLE 5 | 1B 10 35 | Requires emulator card |
| | HPII | ESC DLE 6 | 1B 10 36 | |
| | PS interactive | ESC DLE 7 | 1B 10 37 | |
| | Epson FX | ESC DLE 8 | 1B 10 38 | Requires emulator card |

## Non-PostScript Global Commands

The following escape sequences function in all non-PostScript emulators, including HPII and emulators on emulator cards. You can send global commands at any time when printing a non-PostScript print job. If you send a command in the middle of a page, the follow happens.

- Before executing a personal printer configuration, emulator, or orientation command, the printer print the contents of the print buffer.
- Before changing the tray, paper size, compress lines per inch, or number of copies, the printer completes and prints the page in process.

# Using Global Commands

| Command | Parameter | Format | Hex | Notes |
|---|---|---|---|---|
| Personal Prt | 1 | ESC DLE ! | 1B 10 21 | Non-Turbo printers only |
| | 2 | ESC DLE " | 1B 10 22 | Non-Turbo printers only |
| | 3 | ESC DLE # | 1B 10 23 | Non-Turbo printers only |
| | 4 | ESC DLE $ | 1B 10 24 | Non-Turbo printers only |
| Emulator | PS batch | ESC DLE 0 | 1B 10 30 | Requires PostScript |
| | Diablo | ESC DLE 1 | 1B 10 31 | Requires emulator card |
| | Proprinter | ESC DLE 5 | 1B 10 35 | Requires emulator card |
| | HPII | ESC DLE 6 | 1B 10 36 | |
| | PS interactive | ESC DLE 7 | 1B 10 37 | Requires PostScript |
| | Epson FX | ESC DLE 8 | 1B 10 38 | Requires emulator card |
| No. of copies | | ESC DLE C *n* | iB 10 43 *n* | 01–99 |
| Paper tray | Limitless mode | ESC DLE T 0 | 1B 10 54 30 | Requires optional paper feeder |
| | Standard tray | ESC DLE T 1 | 1B 10 54 31 | |
| | Lower tray | ESC DLE T 2 | 1B 10 54 32 | Requires optional paper feeder |
| | Manual feed | ESC DLE T 3 | 1B 10 54 33 | Env. feeder |
| | | ESC DLE T 4 | 1B 10 54 34 | Requires envelope feeder |
| Paper size | A4 | ESC DLE P 1 | 1B 10 50 31 | |
| | Letter | ESC DLE P 2 | 1B 10 50 32 | |
| | Legal | ESC DLE P 3 | 1B 10 50 33 | |
| | Monarc env. | ESC DLE P 4 | 1B 10 50 34 | |
| | Com 10 env. | ESC DLE P 5 | 1B 10 50 35 | |
| | DL env. | ESC DLE P 6 | 1B 10 50 36 | |
| | C5 env. | ESC DLE P 7 | 1B 10 50 37 | |
| | B5 env. | ESC DLE P 8 | 1B 10 50 38 | |
| | Half letter | ESC DLE P : | 1B 10 50 3A | |
| | Executive | ESC DLE P ; | 1B 10 50 3B | |
| Orientation | Portrait | ESC DLE O P | 1B 10 4F 50 | |
| | Landscape | ESC DLE O L | 1B 10 4F 4C | |
| Compress LPI | On | ESC DLE L A | 1B 10 4C 41 | |
| | Off | ESC DLE L N | 1B 10 4C 4E | |
| Chars per line for A4 paper | 80 | ESC DLE X 1 A | 1B 10 58 31 41 | |
| | 77 | ESC DLE X 0 A | 1B 10 58 30 41 | |
| Transparent printing | | ESC DLE p *n* X *data* | 1B 10 70 31 *n* 58 *data* | |

F

# Changing the System Language

The printer can display messages on the LCD and print help sheets in the following five languages.

- English
- French
- Italian
- German
- Spanish

**Note:** You can only change the system language while the printer is in the HPII emulation. If the current personal printer configuration uses a different emulation, you must change to the HPII emulation before proceeding.

To change the system language from English, follow these steps.

1. Press the **Online/Offline** switch until the LCD displays *Offline.*
2. Press and hold ▼ **Select** for several seconds until the LCD displays *Language=English.*
3. Press ▶ **Next** until the LCD displays the language you want to choose, for example, *Sprache:Deutsch.*
4. Press ▼ **Select** to select the language.
5. Press **Online/Offline** to resume operation.

After selecting a system language, subsequent help pages and LCD messages use the chosen language.

# G
# Shipping the Printer

You can move the *microLaser Plus* printer without disassembly as long as you can ensure that it remains level. This means that you can move it from room to room within the same building without difficulty.

**Caution: When moving the *microLaser XL* printer locally, remove the developer cartridge and waste toner bottle to prevent toner from dropping into the gear mechanism.**

If you are going to ship either the *microLaser Plus* or *microLaser XL* printer, however, you need to remove the consumable supplies before packing the printer for shipment.

**Note:** When returning the printer for service, do *not* ship consumables. They will *not* be returned to you.

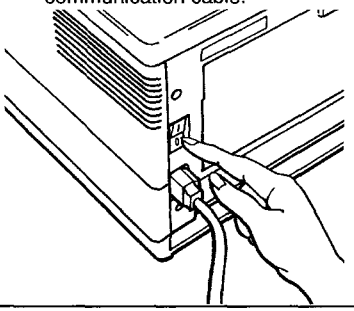
The procedure that you follow for shipping and reassembling your printer depends on the model of your printer.

# Shipping the microLaser Plus Printer

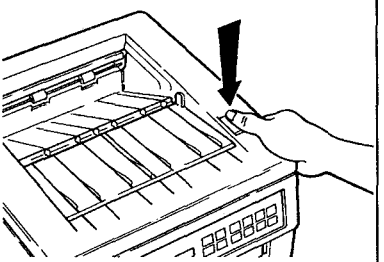
To prepare your *microLaser Plus* printer for shipment, follow these steps.

**Caution: Failure to disassemble the printer properly before shipment will result in spilled toner within the printing mechanism. This necessitates a service call, which is not covered by warranty or service contracts.**

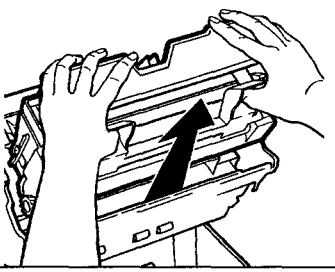
**a.** Turn off the printer and remove the power cord. Disconnect the communication cable.



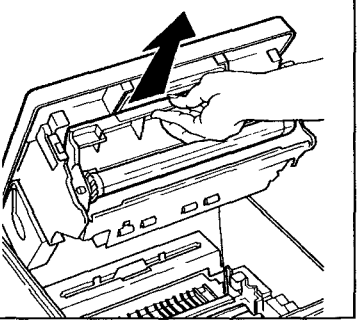
**b.** Press the upper unit release button. Swing the upper unit up about 45 degrees until it stops.



**c.** Remove the developer/toner assembly. Seal the seam between the cartridges with tape and seal them in a plastic bag.

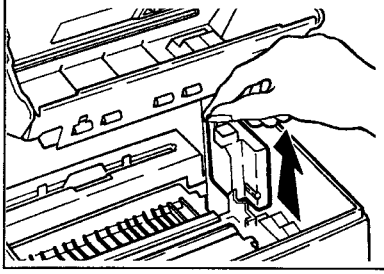


**d.** Remove the OPC cartridge and seal it in a light-proof bag.

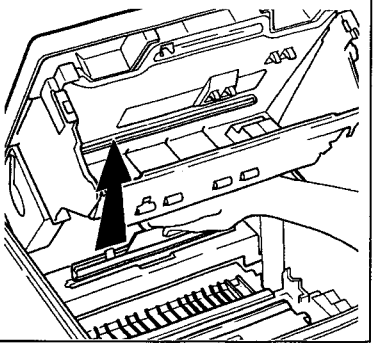


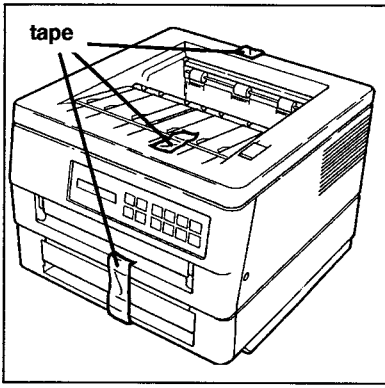
# Shipping the microLaser Plus Printer

**e.** Remove the waste toner bottle and seal the opening securely with tape. Seal the waste toner bottle in a plastic bag.



**f.** Remove the cleaning pad.





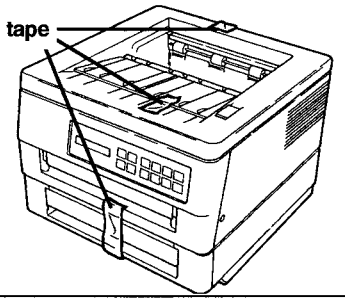

**g.** Tape the paper tray, the top paper tray, and the back panel to secure them during shipment.

**h.** Do not pack the consumable supplies in the original foam packing material. Pack them carefully in a separate box

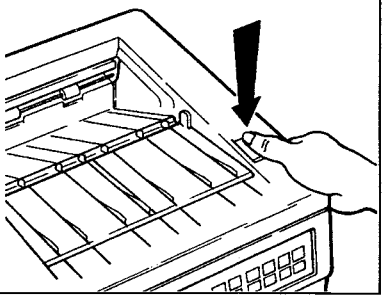
**i.** Pack the printer in the original shipping container and seal the container.

# Reassembling the microLaser Plus

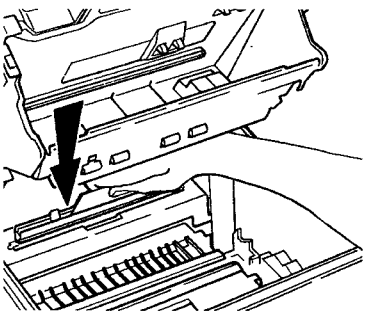
**a.** Remove the tape from the paper tray, top paper tray, and rear panel.



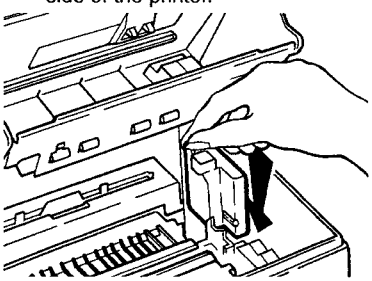

**b.** Press the upper unit release button. Swing the upper unit up about 45 degrees until it stops.



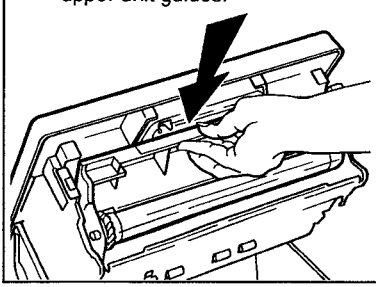
**c.** Insert the cleaning pad in the slot in the dark brown fuser unit.



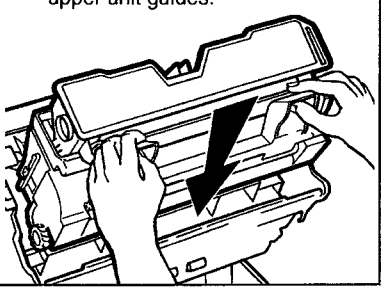
**d.** Remove the tape from the waste toner bottle and insert the bottle in the receptacle on the right side of the printer.



**e.** Unbag the OPC cartridge, and then grasping it by the ledge under the label, insert it into the upper unit guides.

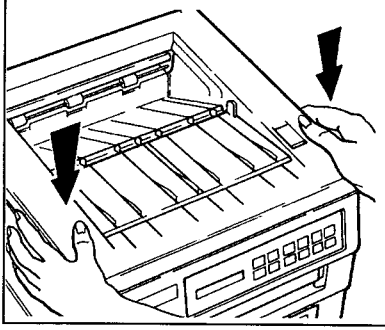


**f.** Remove the tape from the developer/toner assembly and insert the assembly into the upper unit guides.

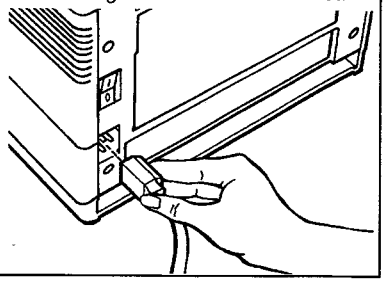


# Reassembling the microLaser Plus Printer

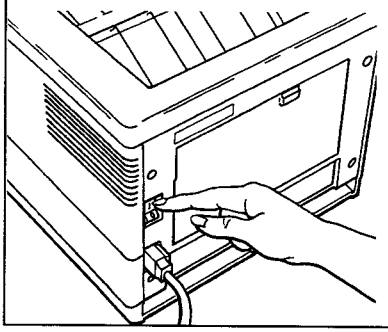
**g.** Press down on the upper unit until it latches shut.



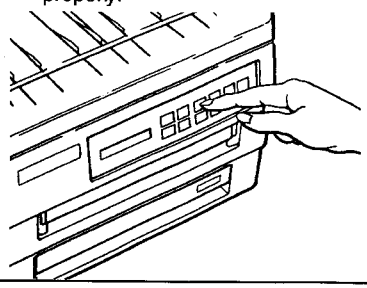
**h.** Insert the power cord in the power receptacle on the back of the printer and plug the power cord into a grounded electrical outlet.



**i.** Put the power switch in the on (I) position.



**j.** After loading the paper tray with paper, print a status report to verify the printer is operating properly.



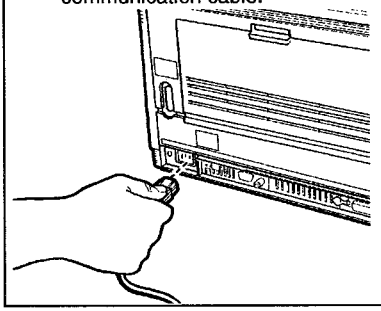
# Shipping the microLaser XL Printer

To prepare your *microLaser XL* printer for shipment, follow these steps.

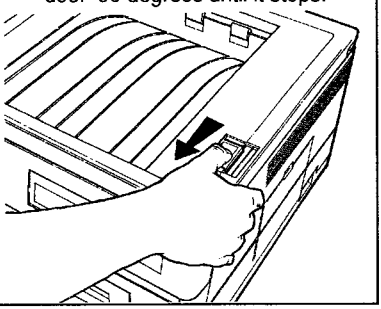
**Note:** You should *never* ship the used developer. The movement during shipment causes toner to be mixed incorrectly, which adversely affects print quality.

**Caution: Failure to disassemble the printer properly before shipment will result in spilled toner within the printing mechanism. This necessitates a service call, which is not covered by warranty or service contracts.**

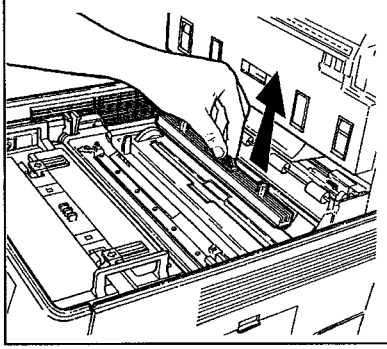
**a.** Turn off the printer and remove the power cord. Disconnect the communication cable.



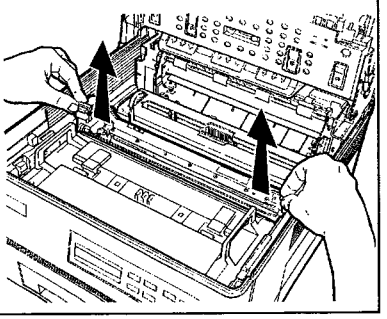
**b.** Slide the top cover release switch forward, and open the top access door 90 degrees until it stops.



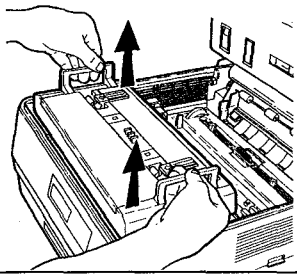
**c.** Remove the cleaning pad.



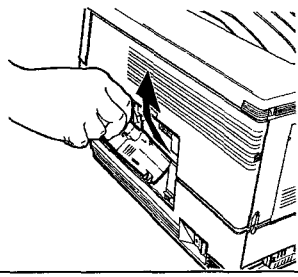
**d.** Remove the OPC cartridge and seal it in a light-proof bag.

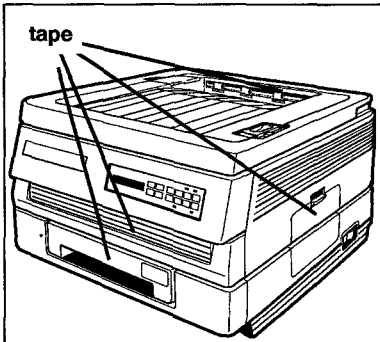


**e.** Remove the developer. Put the developer aside for reinstallation or dispose of it in accordance with local regulations.



**f.** Remove the waste toner bottle and seal the opening securely with tape. Seal the sealed waste toner bottle in a plastic bag.






**g.** Remove paper from the paper tray.

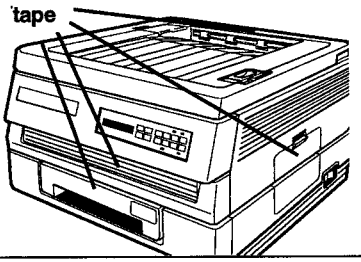
**h.** Tape the paper tray, the manual feed cover, the side access door, and the back panel.

**i.** Pack all removed parts *except* the developer in a separate box *Do not ship the developer.*

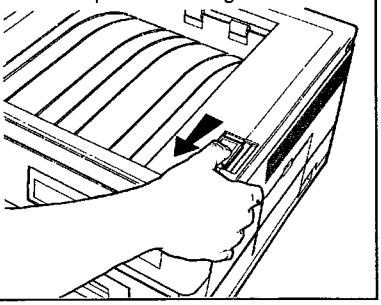
**j.** Pack the printer in the original shipping container and seal the container.

# Reassembling the microLaser XL Printer

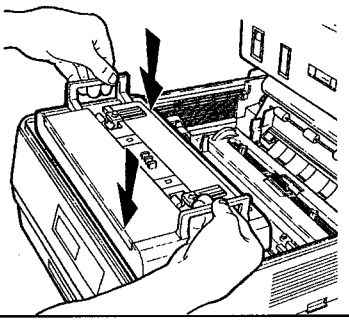
**a.** Remove tape from the paper tray, manual feed cover, waste toner bottle door, and back panel.



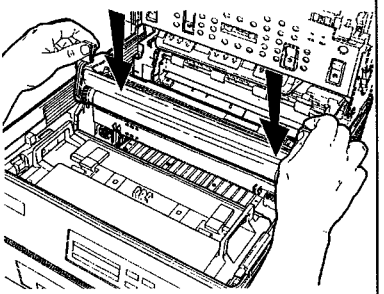

**b.** Slide the upper unit release switch forward. Swing the upper unit up about 90 degrees until it



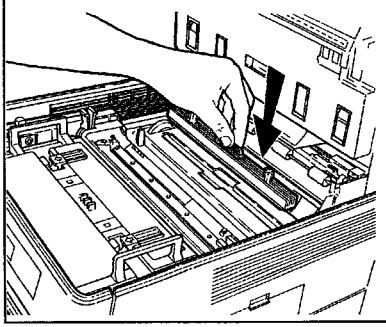
**e.** Reinstall the used developer or install a new developer.



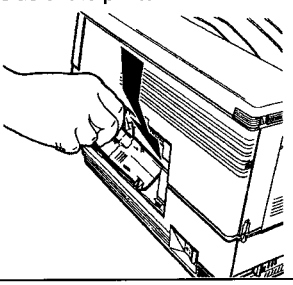
**f.** Unbag the OPC cartridge, and install the OPC into the printer.



**c.** Insert the cleaning pad in the slot in the dark brown fuser unit.

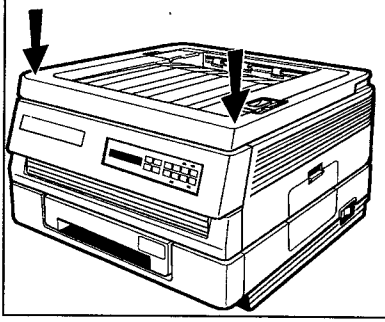


**d.** Remove the tape from the waste toner bottle and insert the bottle in the receptacle on the right side of the printer.

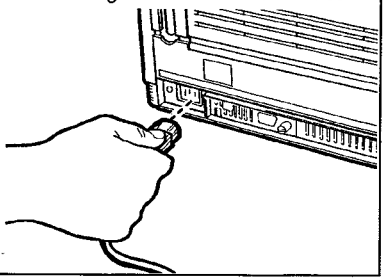


# Reassembling the microLaser XL Printer

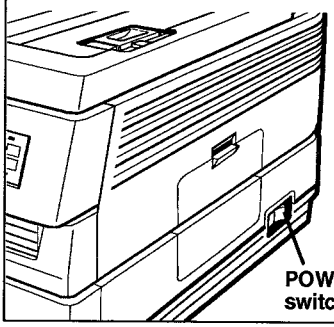
**g.** Press down on the upper unit until it latches shut.



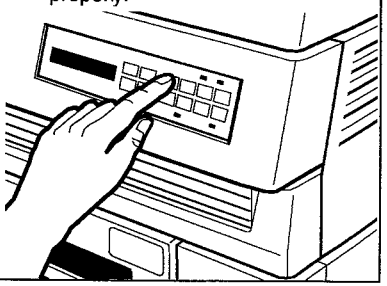
**h.** Insert the power cord in the power receptacle on the back of the printer and plug the power cord into a grounded electrical outlet.



**i.** Place the **POWER** switch in the **ON** (**I**) position.




**j.** After loading the paper tray with paper, print a status report to verify the printer is operating properly.



# H
# Connecting to a Macintosh Computer

Your printer is an excellent companion to the Apple Macintosh Computer. This appendix provides the information to prepare and use your printer with a Macintosh computer.

# Required Equipment

To use the printer with a Macintosh computer, you need to have the following options installed in your printer.

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**Note:** Because of the way the Macintosh computer sends a page to the printer, you may need to add memory if you print more than just text. The amount of memory you need to add depends on the images you print and the software you use to print them. In most circumstances, an additional 1 M Byte of memory is all you need; however, more complex images can require more memory.

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## Non-Turbo Printers

A non-Turbo printer needs the following optional boards.

- PostScript board
  (TI Part No. 2559978-0002 [with 35 fonts] or 2559978-0003 [with 17 fonts])
- AppleTalk+RS-422+RS-232 (AppleTalk) board
  (TI Part No. 2555741-0001)
- If required, 1 MB Memory Board (TI Part No. 2555739-0001)

## Turbo Printers

A Turbo printer needs the following optional boards.

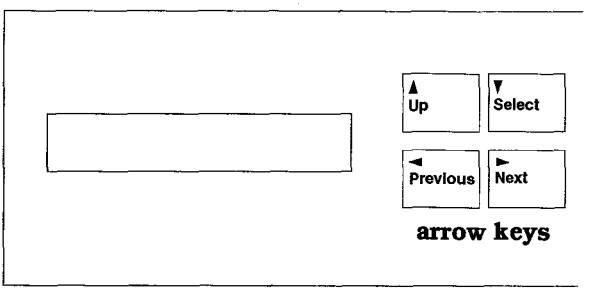
- Turbo board (TI Part No. 2560050-0001 for *microLaser Plus* printers or 2560050-0002 for *microLaser XL* printers)
- AppleTalk+RS-422+RS-232 (AppleTalk) board
  (TI Part No. 2555741-0001) or Comm+SCSI Board
  (TI Part No. 2560054-0001)
- If required, 1 MB Turbo Memory board (TI Part No. 2560052-0001) or 4 MB Turbo Memory Board (TI Part No. 2560052-0002).

# Configuring the Printer

When a printer has all of the boards needed to work with a Macintosh computer, you should be able to connect and print to it using the default configuration. If the default configuration has changed, you can restore it with the folowing procedure.

**Note:** This procedure restores all of the factory defaults on the printer.

1. Turn off the printer.
2. Turn on the printer.
3. Immediately press all four of the arrow keys at the same time.




The printer is now in its default condition and ready to print with the Macintosh computer.

After preparing the printer, you are ready to connect the printer to the computer. Follow these steps.

1. Plug one end of an AppleTalk cable into the printer outlet on the computer.

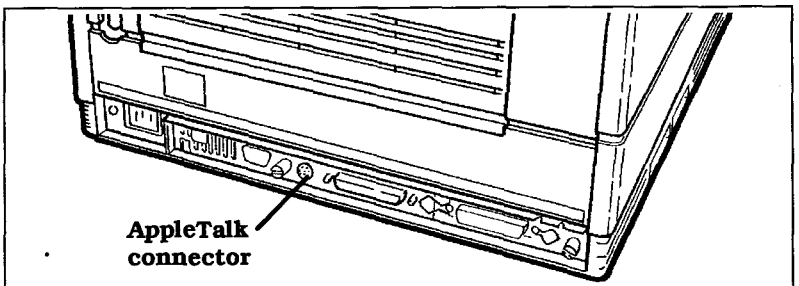
**8-pin minicircular port and plug**

**9-pin port and plug**

**Macintosh printer outlets**

2. Plug the other end of the AppleTalk cable into the round, DIN connector on the AppleTalk board.

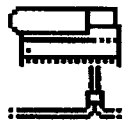
**Caution: On non-Turbo printers, always disconnect the AppleTalk cable before connecting the printer to a different communication interface. Failure to do so could bring down the entire AppleTalk network.**




**rear of printer with AppleTalk board installed**

3. Wait 15 seconds to allow the AppleTalk network time to sense the presence of the printer.

4. Go to the Chooser on the Macintosh Control Panel and select one of the following Laserwriter icons. (To a Macintosh computer, all PostScript printers are Laserwriter printers.



**Macintosh System 6 and earlier**

**Macintosh System 7 and later**

**Laserwriter icons**

5. Select *LaserPrinter* from the menu.

You are no ready to print.

---

**Note:** If you are using the printer on an AppleTalk network with several computers attached, ensure that all computers are running the same version of system software, preferably System 7. The printer reinitializes itself each time a computer with a different system tries to print.

---

## Loading Screen Fonts

Most of the software written for the Macintosh computer can show you on the screen what a file will look like when printed. This feature is called WYSIWYG (pronounced Wiz'zy-wig), which stands for "What you see is what you get." For WYSIWYG software to be most effective, the fonts that show on the screen (screen fonts) should match the printer fonts.

The disk that accompanies the AppleTalk board contains screen fonts for all of the typefaces in the printer with the PostScript board. Follow the instructions with the disk to copy all the screen fonts to your computer.

**Note:** If your printer has 17 PostScript fonts, copy only the following typefaces: Times, Helvetica, Helvetica Narrow, Courier, and Symbol.

## Loading the Paper Tray Manager

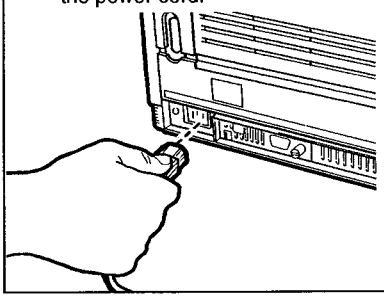
The disk that accompanies the AppleTalk board also contains the Paper Tray Manager™, a program that enables you to take full advantage of the paper-handling capabilities of the printer. If you have an optional paper tray or envelope feeder, or if you need to use the manual feed slot, follow the instructions with the disk to install the Paper Tray Manager on your computer.

# Removing the Controller Board

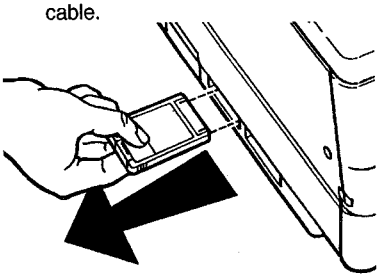
If the diagnostics report or the LED on the controller board indicates that you have a defective board, it is usually better to return only the board for service. Whether the defective board is the controller board or an option board, the first step is removing the controller board. To remove the controller board, follow these steps.

**Caution: Static electricity destroys components on the boards. To prevent component damage, use a high-impedance, grounded, conductive floor mat or wrist strap. If these are unavailable, discharge static electricity from your hands, tools, and containers by touching them to a grounded surface, such as an appliance plugged into a grounded electrical outlet.**

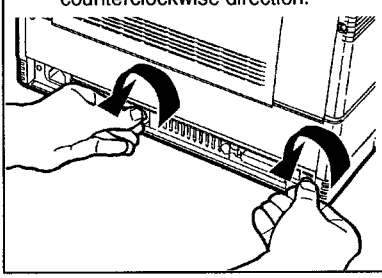
**a.** Place the **POWER** switch in the **OFF** (**O**) position and remove the power cord.



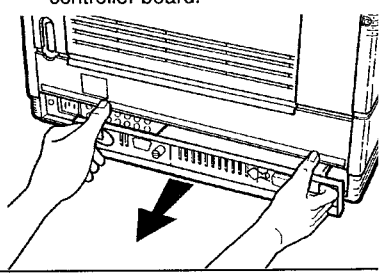
**b.** Remove any *microCartridges* installed in the printer. Also disconnect the communication cable.



**c.** Remove the two thumbscrews that hold the controller board in place by turning them in a counterclockwise direction.



**d.** Carefully pull the controller board completely out of the printer, using the two metal tabs on the controller board.



# Returning a Defective Controller Board

If the defective board is the controller, follow these steps to return the board.

**a.** Carefully remove all options boards from the controller board.

**b.** Place the controller board in a static bag. If a static bag is unavailable, wrap the board in aluminum foil.

**c.** If you do not have a replacement controller board, place each option board in an individual static bag or wrap each separately in aluminum foil.

**d.** When you are ready to reinstall the controller board, carefully remount the option boards on the controller board.

**e.** Insert the controller board into the corresponding grooves on the printer; slide the controller board into the printer until you can feel the connector at the back of the controller board seat in the matching connector on the printer.

**Caution: Forcing the controller board into place can damage the connectors. When aligned properly, the board slides into place easily. If the board does *not* slide into place, pull it out a few inches and try again.**

**f.** Secure the board by replacing the thumbscrews and turning them in a clockwise direction.

# Returning a Defective Option Board

If the defective board is an option board, follow these steps to return the board.

**a.** Carefully remove the defective option board from the controller board.

**b.** Place the defective option board in a static bag. If a static bag is unavailable, wrap the board in aluminum foil.

**c.** Insert the controller board into the corresponding grooves on the printer; slide the controller board into the printer until you can feel the connector at the back of the controller board seat in the matching connector on the printer.

**Caution: Forcing the controller board into place can damage the connectors. When aligned properly, the board slides into place easily. If the board does *not* slide into place, pull it out a few inches and try again.**

**d.** Secure the board by replacing the thumbscrews and turning them in a clockwise direction.

# Maintenance Contracts

Texas Instruments Service offers a variety of maintenance contracts, extended warranties, and other Service offerings. One of these service offerings may be appropriate for your business.

For information about your alternatives, call toll-free, 1-800-847-5757, in the United States and Canada. If you are outside the United States or Canada, call one of the numbers in Appendix J.

# Repair Return Checklist

In the unlikely event that you must return your printer or a customer-replaceable assembly for service, completing the steps on the following checklist can speed processing of your order and limit your inconvenience.

- ☐ Copy and complete a separate Warranty Claim/Repair Request Form for each part you are returning and include the completed form(s) with your shipment.

- ☐ If you are returning the entire unit, prepare the printer for shipment following the procedure in Appendix G. *Do not return any consumable item.* Such items will *not* be returned to you. If you fail to follow this procedure and toner spills during shipment, you will be charged a cleaning fee.

- ☐ Pack the printer or defective assembly securely in its original packing material. Packing material is available from Texas Instruments. *Physical damage caused by inadequate packing is* **not** *covered by warranty or maintenance contract.*

- ☐ If this is a warranty claim, attach a copy of your Proof of Purchase to the completed Warranty Claim/Repair Request Form. If this repair is covered by a maintenance contract, enter the agreement number of the maintenance contract. Otherwise, attach a purchase order number to authorize payment for repairs.

- ☐ After completing the Warranty Claim/Repair Request form, contact Texas Instruments at 1-800-522-4535 for a Return Material Authorization (RMA) number. At that time Texas Instruments will provide you with shipping instructions to ensure your repair is handled promptly.

# Worldwide Sales Offices

## Korea

**Texas Instruments Supply Company Korea Branch**
3rd Floor, Saman Building
678-39, Yuksam-Dong,
Gangnam-Ku,
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Fax: (512) 250-7456

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Fax: 525-515-4178

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Telex: 470127 F

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Fax: 01/741 33 57

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Tel: 021/701 53 54
Fax: 021/702 24 94

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Fax: 65-2535566
Telex: RS36871

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Telex: 82178 (Ref SRUK)

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Tel: (061) 443 2929
Telex: 82178 (Ref STKP)

## United States of America

**Texas Instruments Incorporated**
5701 Airport Road
Temple, Texas 76503
U.S.A.

# Glossary

This glossary explains many of the terms found in this manual as well as other computer-related terms you may encounter.

**AES** — See *Automatic Emulator Switching.*

**application programs** — Programs that instruct the system to perform specific tasks by using either predesigned programs (such as a word processing program) or programming languages that allow you to design your own programs (such as BASIC).

**ASCII** — An acronym for the American Standard Code for Information Interchange; an agreed-upon standard for the assignment of numeric values to letters, digits, punctuation marks, and control codes. The system processes only numbers even though characters, letters, and graphic symbols appear on the screen. The ASCII list is a set of numeric values for the most frequently used characters. Also see *symbol set.*

**Automatic Emulator Switching** — The ability of a Turbo printer to sense whether the data for a print job contains PostScript commands and to switch automatically to the PostScript interpreter or the HPII emulator.

**baud** — A signal element change per second. If a signal element change has only one bit, baud equals bits per second.

**binary** — A system of numbering that uses patterns of only 0's and 1's. Each item of information (whether a letter, graphic symbol, or an instruction) is converted to a binary number before it is processed by your system.

# Glossary

**bit** — A binary digit (0 or 1); the smallest unit of information used by your system.

**bits per second** — The speed at which one device receives or sends information to another device.

**bps** — See *bits per second.*

**buffer** — A portion of the system's memory that temporarily holds information. See also *print buffer* and *receive buffer.*

**byte** — A grouping of eight binary digits (bits) that your system treats as one unit; usually represents one character.

**character** — One of a set of symbols, such as letters, numbers, or punctuation marks, that can express information when collectively arranged. Although these symbols are intelligible to humans, they are not understood by your system. For this reason, standardized character codes consisting of groups of binary digits have been developed to allow characters to be processed by computers and peripherals. In your printer a character is represented by 8 bits or 1 byte.

**character set** — See *symbol set.*

**charging corona** — The wire that charges the surface of the OPC drum.

**cleaning pad** — The device that cleans residual toner from the surface of the OPC drum, storing the waste toner in the waste toner bottle.

**clock** — A timing device that coordinates all internal events in your system.

**command** — The portion of data from the host that specifies what operation is to be performed.

**communications** — The electronic transfer of information between the host and the printer.

**computer** — A combination of a central processing unit and memory designed to process information.

**concurrent communication** — The ability of a Turbo printer to be connected to more than one active communication port. The number of active ports depends on the installed communication options.

**configure** — To adapt the printer so that it is compatible with the host. Also to adapt host software so that it sends the correct control codes to the printer. Also called *setup.*

**control code** — A control code initiates some kind of physical control action that is not printed (such as line feed and tab). The emulation in effect determines the action that is initiated.

**corona wire** — A wire that generates a strong electrical charge. The *charging corona* charges the surface of the OPC drum. The *transfer corona* attracts the toner from the surface of the OPC drum to the surface of the page.

**data** — Information that is input to your system and is then processed by mathematical and logical operations so that, ultimately, it can be output in a sensible form. It usually consists of numbers, letters, or symbols that describe an object, idea, condition, relationship, or other information.

**default value** — A value that your system assumes unless instructed otherwise.

**developer** — The unit that holds toner for transfer to the OPC drum. The developer has a magnetized roller that attracts metal filings (called carrier). The carrier is attracted by the magnet and coats the roller so that the entire outside of the roller is like a brush. As the roller

turns, the carrier picks up and charges the toner and holds it just above the surface of the OPC drum for transfer to the page image.

**diagnostics programs** — Programs that test the components of your system to verify proper operation or to diagnose problems.

**download** — To copy information from a host to the memory of a peripheral unit.

**emulator** — A program that enables the printer to duplicate the action of another printer.

**flow control** — The method your printer uses to prevent data from overflowing the receive buffer. When the receive buffer is almost full, the printer signals the host to stop sending data using the current flow control method. When the receive buffer has room for additional data, the printer signals the host to send data. The printer and the host must use the same flow control method.

**font** — The pattern of characters that the printer uses to represent data received from the host. In the HPII emulator, the characters that represent data are determined by the typeface, the pitch or point size, and the symbol set selected by the user.

**fuser** — The unit in a laser printer that fuses the toner to the page using a combination of heat and pressure.

**graphics** — Visual patterns produced by a printer and formed by patterns of dots.

**hardware** — The physical components of a system. Contrast with *software.*

**hexadecimal** — A numbering system that consists of 16 symbols, 0 to 9 and A to F; used by programmers as a convenient method for expressing binary values.

**host** — The system that sends data to the printer; in most situations the host is an individual computer, although the printer can receive data from a local area network or through a modem.

**input/output (I/O)** — An operation that transfers information between the printer and the host.

**K** — See *kilo.*

**kilo** — A prefix that, in reference to computer memory devices, usually equals 1,024; used to designate the memory capacity of a computer or the storage capacity of a storage device.

**landscape orientation** — The arrangement of the print image on the page such that the long edge is at the top of the image. Contrast with *portrait orientation.*

**LCD** — See *liquid crystal display.*

**liquid crystal display (LCD)** — A display made of material whose reflectance or transmittance changes when an electric field is applied.

**loop** — A series of instructions or one instruction in a program that is repeated for a prescribed number of times.

**M** — See *mega.*

**mega** — Prefix meaning one million; when referring to memory, the figure is actually 1,048,476 (1024 × 1024).

**menu** — A list of items from which to make selections. Items appear on the LCD one at a time, and you can use the arrow switches to move through and select items from the menu.

**microprocessor** — A central processing unit assembled on a single silicon integrated-circuit chip.

**monospaced** — Describes a typeface where all characters have the same width. Contrast with *proportional.*

**multiuser system** — A system in which the printer is shared by several people.

**OPC drum** — A drum made of organic photo conductor material that resides in the OPC cartridge. See *organic photo conductor.*

**option** — A device, either internal or external, that expands the functions or power of your system.

**organic photo conductor (OPC)** — A material that can hold an electrical charge that can be selectively neutralized by strong light. The charged surface of the OPC repels the toner, which carries the same electrical charge. The area of the OPC surface that has been neutralized attracts the toner forming the image. The toner on the OPC surface is pulled onto the paper by the charge on the transfer corona wire. Residual toner is removed from the OPC surface by the cleaning pad and the residual electrical charge is neutralized by a strong light.

**orientation** — The direction that the printer prints the image on the page; can be either landscape or portrait.

**pitch** — A measurement for monospaced typefaces indicating the number of characters that fit in one inch; 10 pitch is the same as 10 characters per inch.

**point size** — A measurement for typefaces indicating the maximum height of a character in points (one point equals 1/72 inch).

**port** — The physical device through which data flows to and from the printer.

**portrait orientation** — The arrangement of the print image on the page such that the short edge is at the top of the image. Contrast with *landscape orientation.*

**print buffer** — That portion of the printer's memory that holds the page image until it is ready to print. The printer assigns all memory to the print buffer that is not reserved for the receive buffer or used by downloaded fonts or macros.

**program** — A list of instructions that tells your system how to perform a specific task.

**proportional** — Describes a typeface where each character occupies space on the line that is proportional to its width. For example, a *W* occupies more space than an *I.*

**RAM** — See *random access memory.*

**random access memory (RAM)** — A type of internal memory used for the temporary storage of information. The contents of random-access memory can be altered, allowing information stored there to be processed. Data stored in RAM is lost when power is turned off.

**read-only memory (ROM)** — A type of internal memory that contains permanent instructions for your system. The contents of ROM cannot be altered. For this reason, essential instructions are permanently stored in ROM. These instructions, such as those that execute the self-test, are not lost when the system is turned off.

**receive buffer** — That portion of the printer's memory reserved for data coming from the host. The data remains in the receive buffer until the printer processes the data and stores the results in the print buffer. The printer prevents the host from sending more data than can fit in the receive buffer using the current flow control protocol.

# Glossary

**RISC processor** — A computer chip providing Reduced Instruction Set Computing, which greatly increases processing speed.

**ROM** — See *read only memory.*

**SCSI** — (Pronounced *Skuz'zy*) An acronym for Small Computer System Interface, an industry standard connector for high-speed data transmission in a local area network.

**self-test** — An automatic check the system performs each time it is turned on.

**software** — Computer programs, usually supplied on diskette.

**symbol set** — A list of codes, such as ASCII, that assigns a special standardized group of binary digits to each printed character.

**toner** — A fine, black powder that forms the image on the page. The toner is permanently fused to the page in the fuser unit.

**transfer corona** — The wire that attacts the toner from the surface of the OPC drum to the surface of the page.

**typeface** — A family of characters that defines the shape of the printed characters. Typefaces can be monospaced or proportional.

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