User's Reference Manual

HP LaserJet 4Si
Printer

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Conventions

This manual uses the following conventions:

Bold is used for emphasis.

Italic refers to a related document title, or is used for emphasis.

COMPUTER type refers to printer display messages, or commands seen on your PC terminal.

DISPLAY FONT indicates text visible on the printer display.

The cursive letter ℓ is used in examples to distinguish the letter 1 ("ell") from the numeral **1** (one). The character $\emptyset$ is used in examples to distinguish the numeral 0 (zero) from the letter O.

▓▓▓▓ indicates one of several keys (such as ▓▓▓▓) on the printer control panel.

Keyface indicates one of several keys (such as **Enter**) on your computer keyboard.

Note   Notes contain important information set off from the text.

CAUTION   Caution messages appear before procedures which, if not observed, could result in loss of data or in damage to equipment.

WARNING   Warning messages alert you to a specific procedure or practice which, if not followed correctly, could cause personal injury.

Table of Contents

HP LaserJet 4Si
Features

Introduction

This chapter provides an overview of the features of your new HP LaserJet 4Si or 4Si MX printer.

It also includes information about:

- Key Features
- Accessories and options
- Printer parts

Key Features

The HP LaserJet 4Si printer offers:

HP LaserJet 4Si Printer Features

Engine/Performance and Print Quality Features	• 17 ppm (pages per minute) printing.
	• True 600 dpi (dots per inch) printing.
	• Resolution Enhancement technology™ (REt) for adjusting dot placement and size for both 300- and 600-dpi printing.
	• Integrated transparency fuser
Paper Handling Features	• 75,000 page-per-month duty cycle.
	• Two 500-sheet standard input trays.
	• A large-capacity, correct-order, top out bin with "bin-full" sensor.
	• Job offset
	• A face-up (reverse order) rear output tray.
	• Manual envelope printing.
	• Label and transparency printing.

HP LaserJet 4Si Printer Features (continued)

Formatter/Language/Fonts Features	• Enhanced PCL 5^e printer command language, with fully integrated HP-GL/2 vector graphics support.
	• Printing resource saving—memory you can configure to store and save fonts and forms when switching between printer command languages.
	• Context language switching—automatically switches the printer between supported printer command languages.
	• Optional Adobe PostScript™ Level 2 SIMM.
	• 45 internal scalable typefaces with TrueType support.
	• 2 MByte standard memory, expandable to 34 MBytes.
	• Two font cartridge slots.
	• Four SIMM sockets
	• *Standard in the 4Si MX only:* Adobe PostScript Level 2 SIMM, 35 Adobe Type 1 Typefaces, 10 MBytes memory.
User Interface and I/O Features	• Standard Bi-Tronics parallel I/O.
	• Two modular I/O slots for optional interfaces.
	• LCD front panel display.
	• Easy consumable replacement.
	• Firmware in English plus 10 additional languages.[1]
	• Automatic I/O switching.
	• *Standard in the 4Si MX only:* HP JetDirect Ethernet interface, HP JetDirect LocalTalk interface.

1 Danish, Dutch, Finnish, French, German, Italian, Norwegian, Portuguese, Spanish, Swedish.

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Accessories and Options

You can increase the capabilities of the HP LaserJet 4Si printer by adding options and accessories. To order options or accessory products for your printer, see the accessories brochure included with your printer, or call your authorized HP dealer.

Accessories

Option	Part Number	Description or Use
Memory Modules (SIMMs)	1 MByte – C2063A 2 MByte – C2064A 4 MByte – C2065A 8 MByte – C2066A	Provides up to 32 Mbytes of additional memory. (Your printer comes with 2 Mbytes standard memory. See page 2-8 for additional memory recommendations.) Additional memory modules may be available in the future.
Duplex unit	C2061	Provides capability for printing on both sides of the paper.
Optional paper trays	92291B – letter 92291C – legal 92291D – A4 92291E – executive	Holds 500 sheets – letter, legal, A4, or executive paper sizes.
Envelope Feeder	C2060A	100-envelope capacity power feeder
Extensive Font Collection	See your accessory brochure	Enhances your printing capabilities
1500-sheet paper feeder	C2920A (A4) C2921A (letter)	Large capacity paper input tray

Accessories (continued)

Option	Part Number	Description or Use
Printer cabinet	C2917A	Custom-designed cabinet for your LaserJet 4Si or LaserJet 4Si MX printer.
2,000-sheet Output Paper Stacker	C2801A	Large capacity output paper stacker (with integrated printer stand) for high volume printing.
Network I/O cards	J2371A	Ethernet with 10-Base-T connector.
	J2372A	Ethernet with 10-Base-T and 10Base2 connectors.
	J2373A	Token Ring.
	J2341B	LocalTalk interface.
Unix Interface Software	J2734A	HP JetDirect interface software for HP/UX systems.
	J2735A	HP JetDirect interface software for Sun Unix systems.
Toner Cartridge	92291A	Microfine toner cartridge for HP LaserJet 4Si printer.

HP LaserJet 4Si Printer Parts

Spend a few minutes reviewing the following three illustrations so that you can locate and identify the key printer parts.

Figure 1-1
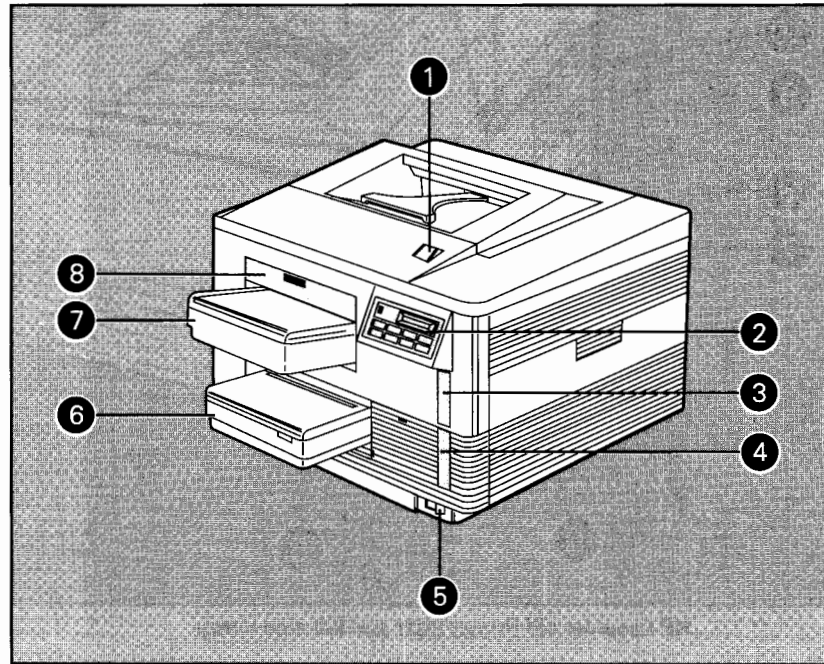
HP LaserJet 4Si Printer (front and right side view).

1 Top cover release button
2 Control panel
3 Top type cartridge slot
4 Bottom type cartridge slot

5 ON/OFF power switch
6 Lower paper tray
7 Upper paper tray
8 Envelope feeder access cover

Figure 1-2
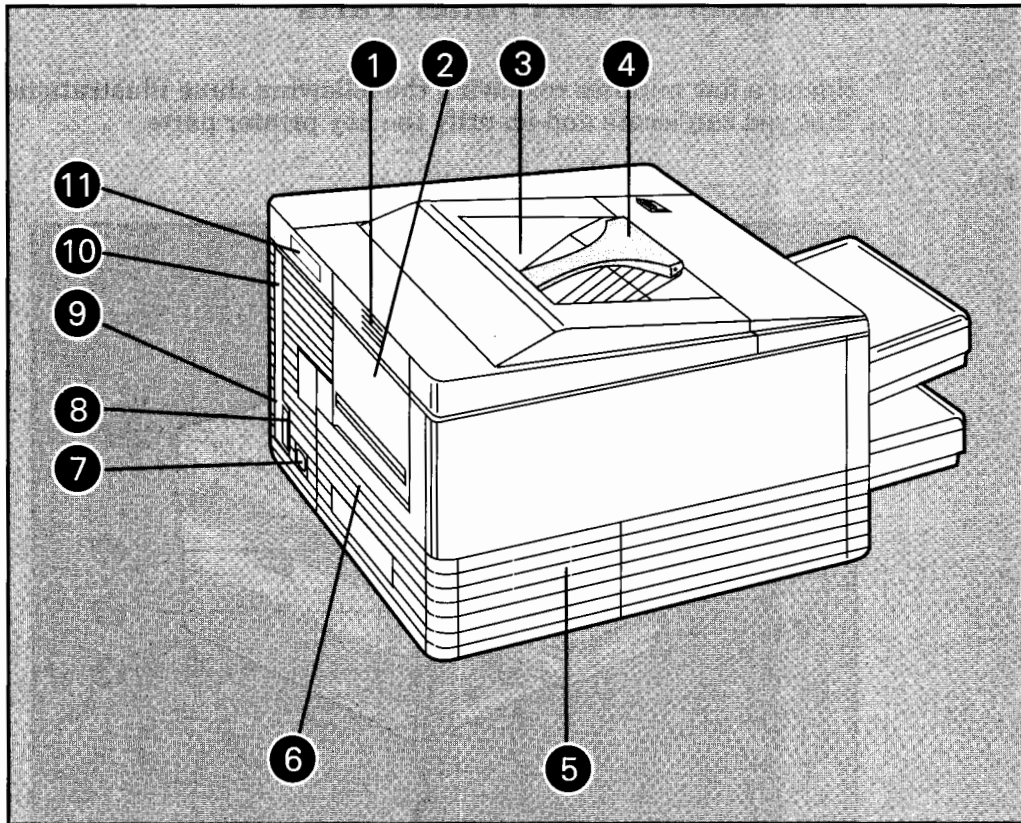
HP LaserJet 4Si Printer (rear and left side view).

1 Lower (rear) output bin
  press/release latch
2 Lower (rear) output bin
3 Upper output bin
4 Paper sensor arm
5 Press/release latch for access
  to duplex area

6 Duplex installation slot cover
7 Power connector plug
8 Bi-Tronics connector
9 Lower MIO slot
10 Upper MIO slot
11 Serial number location

Figure 1-3
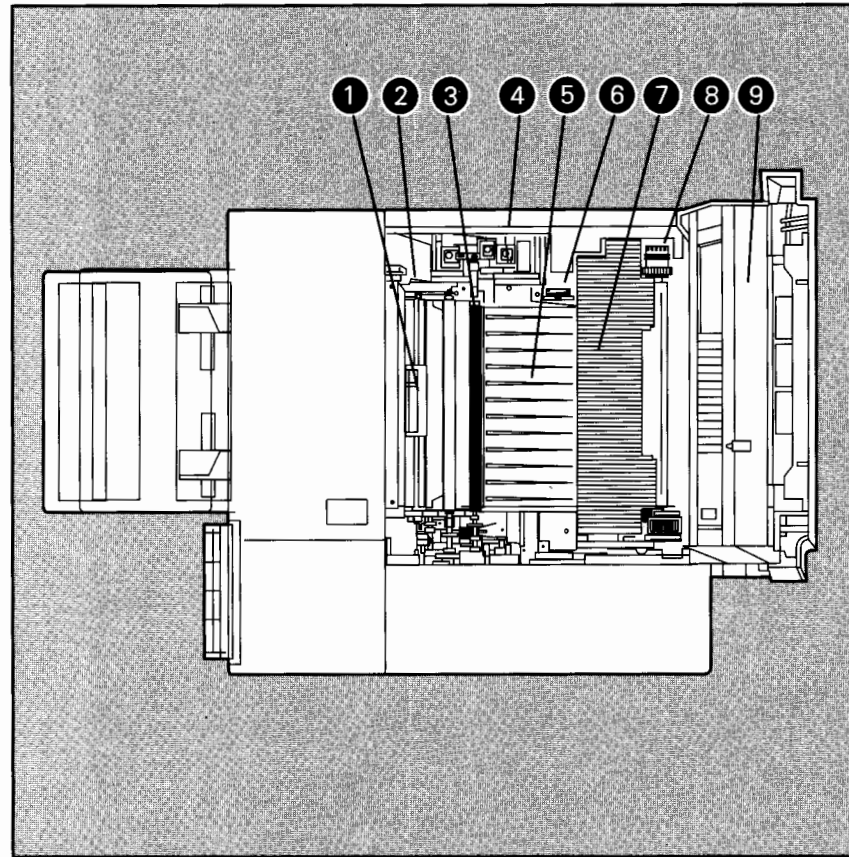
Inside the HP LaserJet 4Si Printer (top view with top cover open).

1 Upper paper path
   access (green handle)
2 Lower paper path
   access (green handle)

3 Transfer roller
4 Cleaning brush
5 Paper guide
6 Print density control

7 Fusing assembly
8 Paper clearing aid
9 Toner cartridge

Printer
Control
Panel

Introduction

This chapter contains information about the printer control panel, its use, and related tasks:

- When to use the printer control panel

- Software, Your First Choice

- Memory requirements

- The printer's control panel and shared environments

- Automatic I/O switching

- Printer Job Language

- Resource Saving

- Control panel layout

- Control panel keys

- Control panel menus
  - Selecting menu items
  - Defaults
  - Printing Menu
  - PCL Menu
  - Job Menu
  - Configuration Menu
  - Memory Configuration Menu
  - Parallel Menu
  - Test Menu, including PCL Self Test and PCL Demo Page

- Changing the control panel display language

When to Use the Printer Control Panel

Use the printer's control panel menus to select items such as number of copies, manual feed, and resolution enhancement. Although you can make these selections at the control panel or remotely, the easiest way to control your printer is to use your software application. *Most of the time you do not need to make printing selections from the control panel; you can use your software instead.*

> If you installed the correct printer driver, your software application enables you to select printing options. In this case, use the control panel to:
>
> • Select which language you want for your display messages.
>
> • Use the Parallel or MIO Menus to configure your I/O port(s).
>
> • Select printer language-switching and resource-saving defaults

MacNote

Macintosh users: these terms are used differently in this manual:

- *Control Panel* refers to the printer's control panel, not the Control Panel utility on your Macintosh.

- *Menu* refers to a list of selectable items on your printer's control panel, not a menu you choose on your Macintosh screen.

Use the control panel when:

- Your software does not enable you to make a selection.
- You make printer configuration changes which software cannot control.
- You need to identify the typefaces available in the printer's memory.
- You need to print a diagnostic Self Test.
- You need to switch between on-line and off-line status.

For all Printing, PCL, and Job Menu items, software commands always override control panel settings. For example, a command from your word processing software application to print four copies of a document overrides a control panel default setting to print one copy, but only for that job.

Note   If your printer operates in a shared environment, changes you make through the control panel or remotely can affect other users. Downloaded typefaces and macros, as well as other downloaded items, such as user-defined symbol sets and fill patterns, are stored in printer memory. Changing the printer default personality, resolution, page protection, or memory configuration may purge these items from the printer memory. If control panel locking is enabled, you must contact your system administrator to make any changes to the control panel settings.

Software, Your First Choice

The easiest way to control your printer is by using the printing feature of your software application (such as a word processor or spreadsheet). For this, you must have an appropriate printer driver.

Printer Drivers

Printer drivers are specific software programs that come with your software application. Drivers enable you to do such things as set margins, change typefaces, and select the number of copies.

Most printer drivers support many printers and a range of common hardware configurations. If your software application has an HP LaserJet 4Si printer driver, it can send the correct commands the printer to carry out the tasks you request.

Software drivers for several common applications are shipped with your printer. If there is no driver for your software application, you can select a substitute driver such as an HP LaserJet 4, IIISi, IIID, or LaserJet III printer driver. Although these drivers enable you to use your HP LaserJet 4Si printer, they may not support all of the new features of your printer (such as 600 dpi resolution and duplex printing).

See the your software documentation or contact your authorized HP dealer for more information about printer drivers. (Driver installation instructions are usually on a "READ ME" file on the printer driver disk.) For information about updating printer drivers for accessory typeface products, see Chapter 4, "Using Type."

PostScript™

If your printer has the PostScript language installed, use the printer's control panel to select menu items for PostScript. See Chapter 5, "PostScript Printing," for further information.
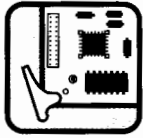
Memory Requirements

The following memory requirements apply only to the HP LaserJet 4Si printer. (The HP LaserJet 4Si MX printer, which has the PostScript language, LocalTalk and Ethernet interfaces, and an additional 8 Mbytes of memory (10 Mbytes total) already installed.

Your printer comes with 2 Mbytes of internal (standard) memory. For most printing situations, this is sufficient. However, you may receive an "out of memory" message (20 MEM OVERFLOW) or "print overrun" message (21 PRINT OVERRUN) if you print memory-intensive documents. These are documents containing complex graphics and a number of downloaded typefaces, documents at 600 dpi resolution, complex vector graphics, or legal-size pages in PostScript). When you receive this message, you can simplify the complexity of your document (by using fewer downloaded typefaces or less complex vector or smaller raster graphics) or install additional memory.

Of the 2 Mbytes of memory that comes with your printer, a portion is used by the printer (system memory) and the remainder is available for the user. For information about how memory affects page protection, resolution, and clearable warnings, see these sections later in this chapter and in Chapter 5, "PostScript Printing," and Chapter 7, "Troubleshooting."

Table 2-1 gives HP's minimum memory recommendations for certain printing situations, with the page protection feature ON or OFF. *You may not need to use page protection for most printing situations, and setting on Page Protection will affect printer performance. Before you purchase extra memory, try different combinations of page protection and resolution.*

Table 2-1

Minimum Memory Recommendations (Mbytes)
(Includes 2 Mbytes of internal memory)

Printing Need	300 dpi	600 dpi
PCL only	2 Mbytes	2 Mbytes
PCL only with PAGE PROTECT=A4	2 Mbytes	6 Mbytes
PCL only with PAGE PROTECT=LEGAL	2 Mbytes	6 Mbytes
PCL and PostScript, simplex[1] printing, PAGE PROTECT=OFF	2 Mbytes	6 Mbytes
PCL and PostScript, simplex printing, PAGE PROTECT=A4	2 Mbytes	6 Mbytes
PCL and PostScript, simplex printing, PAGE PROTECT=LEGAL	2 Mbytes	6 Mbytes
PCL and PostScript, duplex[2] printing	4 Mbytes	10 Mbytes
PCL and PostScript, simplex printing, with Resource Saving[3]	10 Mbytes	10 Mbytes
PCL and PostScript, duplex printing, with Resource Saving	14 Mbytes	14 Mbytes

1 Single-sided printing.
2 Double-sided printing
3 Resource Saving reserves sufficient memory for both page protection and duplex printing. See the discussion of Resource Saving beginning on page 2-12.

The Control Panel and Shared Environments

Your printer's control panel functions in a network or other shared printer environment the same as if used alone. If you have shared printer problems, see your network or printer administrator. Here are a few considerations when sharing your printer with other users:

- See your network printer administrator before making control panel changes. Any change you make can affect everyone else's print jobs.
- If control panel locking is enabled, you will need to contact your system administrator to make any changes to the control panel settings
- Coordinate setting the default printer typeface and downloaded soft typefaces with other users. This conserves memory and avoids unexpected printer output.
- Be aware of how switching the personality (language) affects other printer users. For example, unless Resource Saving (see page 2-12) is activated, your printer purges all downloaded typefaces, macros, and similar data from memory when you switch between PCL and PostScript.
- Be aware of how page protection and resolution settings affect printer memory. See the "Clearable Warnings" and "Page Protection" sections later in this chapter for memory requirements.

Note   Your network operating system may automatically protect each user's print job from the effects of other print jobs in the system. Check with your network or printer administrator to see if this applies to your system.

Automatic I/O Switching

Your printer's three I/O ports—two modular I/O ports and a Bi-Tronics parallel port (see note)—are active (able to accept data) at the same time. This enables you to attach cables to all installed ports and communicate to all ports concurrently (see Figure 2-1). Your printer automatically switches between ports to accommodate incoming data.

Note

Bi-Tronics parallel is compatible with Centronics parallel. Although it uses the same cable, hardware, and software as Centronics parallel, to receive its enhanced capabilities (such as bi-directional communication between the computer and printer, faster transmission of data, and autoconfiguration of printer driver) you need software that supports these features. Check with your software vendor to see if your software supports Bi-Tronics parallel features.

Automatic I/O switching can be adjusted for maximum performance by using the timeout feature. If, when using multiple ports, data from other ports appears in the middle of your print job, increase the timeout value. See Timeout under the Job Menu later in this chapter.

CAUTION

Proper Grounding: Ensure that all interface cables and host computers attached to the printer follow proper grounding methods for electronic equipment in accordance with local electrical codes.

Figure 2-1
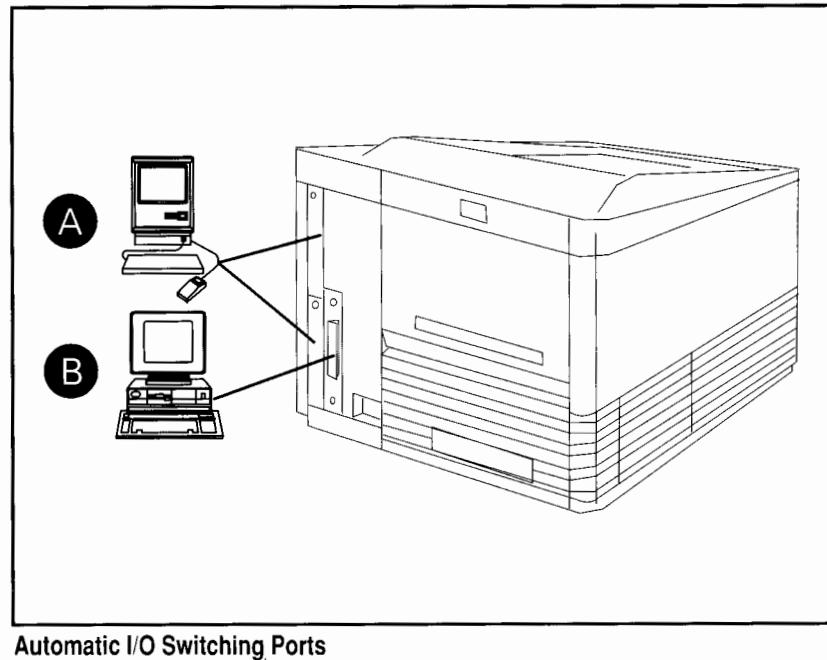
Automatic I/O Switching Ports

A. Modular I/Os   **B. Bi-Tronics parallel**

Printer Job Language (PJL)

Your printer receives instructions from a host and transmits
information, depending upon the application, through HP's PCL or
PJL language. While PCL commands can *temporarily* change control
panel menu values, PJL commands can change the printer's
permanent default values. Through PJL, you can change control
panel settings such as personality, resolution, and page protection.
These changes are made through printer commands embedded in
your file. For information about using PJL printer commands, see
Appendix A, "Printer Commands."

Resource Saving

Your **printing environment** is a combination of all the current
printer configuration settings, including downloaded fonts, typefaces,
and macros. Switching between printer languages (such as PCL and
PostScript), and other memory reconfigurations (such as changing
the page protection setting) commonly erases these from printer
memory.

Resource Saving prevents this problem by reserving large blocks of
printer memory to retain these items. Memory can be separately
reserved for each of the printer languages in your printer.

Resource Saving is accessible only when sufficient additional memory
to support environment saving is added. You can set and configure
Resource Saving through the Memory Configuration Menu (see page
2-38). The Memory Configuration Menu enables you to increase (or
decrease) memory for each personality in 100 KByte blocks.

Refer to table 2-1 on page 2-8, which shows the minimum memory
requirements for Resource Saving.

Note

The total printer memory available for saving one environment is
affected by other factors, such as any memory reserved for other
environments. If Resource Saving is set ON (RESORCE SAV=ON* in the
Memory Configuration Menu), the self test page includes a section
showing how much Resource Saving memory is reserved and in use
for each personality).

Control Panel Layout

Figure 2-2
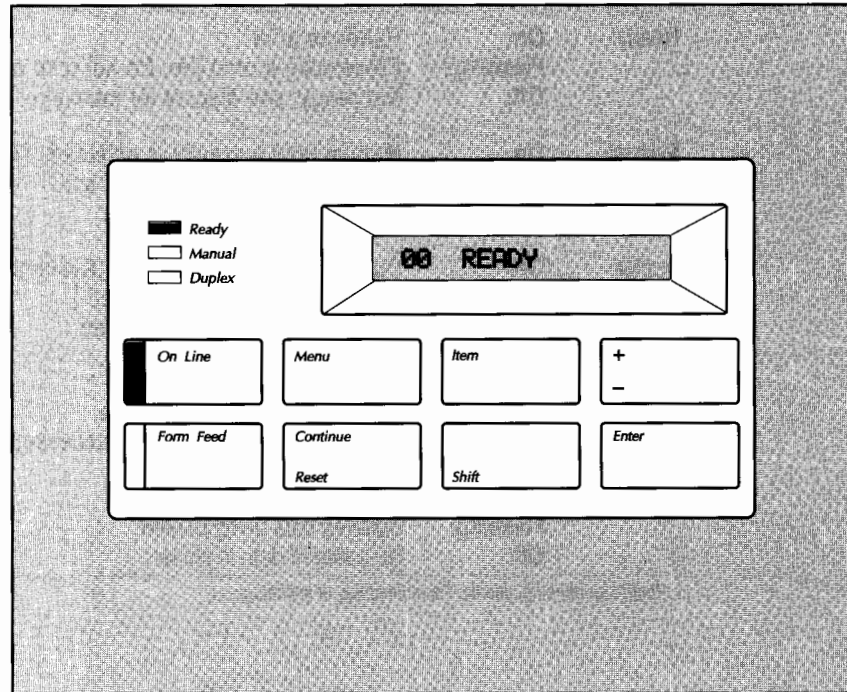
Control Panel and Display

The control panel (see Figure 2-2) consists of eight keys, five
indicator lights, and a 16-character display panel. The five indicator
lights are described in Table 2-2 on the following page.

Table 2-2

Indicator Lights

Indicator	Mode	Description
Ready	**On:** **Flashing:** **Off:**	Ready to print. Processing a print job. Do not take off line or switch off. Not ready; see display for message.
Manual	**On** **Off:**	Manual feed currently is selected. The printer will draw media from the manual feed slot. Manual feed is not selected.
Duplex	**On:** **Off:**	Duplex printing is selected. (Available only when the duplex printing accessory is installed.) Duplex printing is not selected.
On Line	**On:** **Flashing:** **Off:**	Ready to receive data. Going from on line to off line. Off line. Other keys can be accessed.
Form Feed[1]	**On:** **Flashing:** **Off:**	Data still in printer buffer. Buffered data being printed. No buffered data in printer.

1 PostScript does not use the Form Feed key or indicators.

Control Panel Keys

Your printer has two rows of control panel keys. The upper row keys are (**On Line** , **Menu** , **Item** , and **+**). The lower row keys are (**Form Feed** , **Continue** , **Shift** , and **Enter**).

Some keys (such as **-**) are activated only by holding down **Shift** , which works like the shift key on your computer's keyboard. Others have a second level of functions which are accessed by holding down **Shift** . For example, if you press and release **Reset** while holding down **Shift** , you access the reset function. These alternate functions (**Reset** and **-**) are coded the same color as **Shift** . In addition, **Reset** has another level of functionality. Table 2-3 details both single key functions and shift-key combinations.

Table 2-3

Control Panel Key Functions

| Key	Function
On Line	Switches the printer between **on-line** (communicating with the computer or other data source) and **off-line** (not communicating). Both the On Line and Ready indicator lights are on when the printer is ready to receive data. 00 READY usually is displayed when on line. Some temporary conditions cause a message such as TONER LOW or a clearable warning message to appear in the display instead of 00 READY. The printer must be off line to use other control panel keys.
Menu	**Menu** cycles through the menu selections, returning to 00 READY at the end of the cycle unless a problem is encountered. See the "Control Panel Menus" section in this chapter. If an option such as PostScript is added, a menu for that option appears in the menu sequence. Holding down **Shift** while pressing **Menu** cycles through the menu selections in reverse order.
Item	**Item** enables you to cycle through the choices available for a particular menu. Menu items vary, depending upon the options installed and the configuration of other menu choices. Holding down **Shift** while pressing **Item** cycles through the item selections in reverse order.

Table 2-3 (cont.)

Control Panel Key Functions (continued)

Key	Function
▓ or ▓	▓ enables you to *step* (by momentarily pressing the key) or *scroll* (by holding down the key) through the item choices for a specific menu. ▓ (▓ + ▓) enables you to cycle through the item choices in reverse order.
Form Feed	Prints any data remaining in printer's buffer. You cannot use it to send a blank sheet of paper through the printer.
Continue	Continue enables the printer to resume printing after being placed off line because of a printer message (such as 21 PRINT OVERRUN). ▓ clears most printer messages and places the printer back on line. It functions like On Line except:
	• Continue enables you to override the paper or envelope size selection regardless of what size media is in the paper trays or the optional envelope feeder. For example, you could print an A4-size page on legal-size paper if legal-size paper is loaded in the paper tray.
	• Continue enables you to override a request to manually feed paper or an envelope; it selects paper from the next available source instead.
Shift	Accesses the lower labels (▓ and ▓) on the control panel keys. It works like the ▓ on your computer's keyboard.

| Table 2-3 (cont.) | **Control Panel Key Functions (continued)** |

Key	Function
Enter	Saves a selection in the printer's "permanent" memory. An asterisk (*) appears next to the item to indicate that it is now the default. As a "permanent" default (see Table 2-6, Control Panel Defaults), the selection remains even if the printer is switched off or you perform a reset (see **Reset** below). If no data is in the printer's buffer, the printer is not in a job, and no temporary data such as downloaded typefaces or macros is present, the printer automatically performs a reset when you exit the Menus.

If buffered data or temporary data (such as temporary downloaded typefaces) are present, **Enter** only marks the items with an asterisk (*) as the default. When you press **On Line** or **Menu**, the message 10 RESET TO SAVE appears. There are three options:

- **Reset** (**Shift** + **Reset**)clears page buffers, removes temporary data such as downloaded typefaces, and returns temporary settings to their "permanent" default values.

- **On Line** places the printer on line without performing a reset; changes remain recorded in the menu (marked with an *) but are not active until the printer is reset or a job boundary is detected.

- **Continue** places the printer on line without performing a reset. (See the explanation of the **Continue** key on the preceding page.) Changes remain recorded in the menu (marked with an *) but are not active until the printer is reset or a job boundary is detected.

2 Printer Control Panel

Table 2-3 (cont.)

Control Panel Key Functions (continued)

Key	Function
Reset (and Menu of Resets)	A reset (**Shift** + **Reset**) displays 07 RESET, clears the printer's page buffer, removes all temporary typefaces and macros, and makes the current user-established defaults "permanent"—they are the default values until you change them (see Table 2-6, "Control Panel Defaults," later in this chapter). When a reset is performed, the input buffer of the *active* I/O is purged; other I/O buffers are not affected.

To access the MENU OF RESETS, hold down both **Shift** and **Reset** for approximately 5 seconds until RESET=MENU* appears in the display panel. Use [+/−] to cycle through the display choices, and **Enter** to select the option. Execute the reset by pressing **On Line**. See Table 2-4, "Menu of Reset Choices," following this table for more information. |

Reset Menu

Use the Reset Menu function with caution. You can lose buffered page data or printer configuration data. Reset Menu is activated by holding down both **Shift** and **Reset** *for about 5 seconds* until RESET=MENU* appears. Use █ or █ to cycle through items and **Enter** to select the item. Press **On Line** to reset. There are three reset choices:

Table 2-4

Menu of Reset Choices

Choice	Explanation
Reset=Menu	09 MENU RESET is briefly displayed. Reset Menu clears the page buffer, removes all temporary personality data (for example, downloaded typefaces), and resets all printing environment parameters (such as number of copies, paper size), and sets user-selected defaults to their factory defaults. Items in the Config, Parallel, Memory Configuration, and MIO Menus are not reset. RESET=MENU clears only the active I/O input buffer.
Reset=Active I/O	09 RST ACTIVE I/O is briefly displayed. Reset Active I/O clears the page buffer, removes all perishable personality data such as temporary typefaces, and clears the input and output buffers *for the active I/O only.*
Reset=All I/O	09 RESET ALL I/O is briefly displayed. Reset All I/Os clears the page buffer, removes all perishable personality data such as temporary typefaces, and clears the input and output buffers *for all I/Os.*

2 Printer Control Panel

· Control Panel Menus

The table below shows the menus and menu items available with the basic printer configuration. Detailed descriptions of specific menu items are given in the tables which follow. If options such as PostScript, duplex, or an optional I/O are installed, new menu items are added automatically at the appropriate location. For example, a PostScript Menu appears following the PCL Menu (see Chapter 5, "PostScript Printing").

Table 2-5

Control Panel Basic Menu Structure

PRINTING MENU →	PCL MENU →	JOB MENU →	CONFIG MENU →	MEM CONFIG MENU[2] →	PARALLEL MENU →	TEST MENU →
COPIES ↓	FONT SOURCE ↓	PAGE PROTECT ↓	LOCK ↓	RESORCE SAV ↓	HIGH SPEED ↓	SELF TEST ↓
OUT BIN ↓	FONT NUMBER ↓	RESOLUTION ↓	CLR WARN ↓	XXX MEM ↑	ADV FNCTNS ↑	CONT SELF TEST ↓
PAPER (ENVELOPE) ↓	PITCH (PT SIZE)[1] ↓	PERSONALITY ↓	AUTO CONT ↓			PCL TYPE LIST ↓
ORIENTATION ↓	SYM SET ↑	TIMEOUT ↑	LOW TONER ↓			PCL DEMO PAGE ↑
FORM ↓			SERVICE MSG[3] ↑			
MANUAL FEED ↓						
JOB OFFSET ↓						
RET ↑						
These menu items can be changed by software.			These menu items cannot be changed by software.			

1 The selection PT. SIZE appears only if appropriate.
2 This menu appears only if enough memory is installed to support Resource Saving. See Table 2-1 on page 2-8.
3 The message appears only when the 200,000-page service is required. Refer to the *Operator's Guide* for more information.

Selecting Menu Items

To select a menu item:

1 Press **On Line** to take the printer off line. (The on-line indicator will not be lit.)

2 Press **Menu** repeatedly until you reach the desired menu (Printing Menu, for example).

3 Press **Item** repeatedly to cycle through the menu selections.

4 When you reach the desired item (copies, for example), press ▮ to cycle through the selections (if the ▮ key is held down, you can scroll through selections at a faster pace). Pressing ▮ cycles through the selections in reverse order.

5 Press **Enter** to save the selection as the default. An asterisk (*) appears next to the item.

6 Press **On Line** to return the printer on line. (The on-line indicator will be lit.)

Defaults

Your printer makes most printing decisions by accessing values, either "temporary" or "permanent," set through its control panel. Commands sent from software override these settings.

Table 2-6

Control Panel Defaults

Default	Definitions
Temporary	A *temporary* default is a value set for the current print job by your software application. For example, a request from your software to print 3 copies instead of the control panel "permanent" default value of 1 copy is a temporary default. The printer uses the *temporary* default value until you send another software request or perform a reset.
Permanent	A *permanent* default is a control panel value set by pressing ▓Enter▓ . An asterisk (*) appears following the item to indicate it is a user-selected default. If the printer is switched off or a temporary request ("print 3 copies," for example) is sent to the printer by your software application, the printer will return to this value as the default. If no data is in the printer's buffer, it is not currently printing, and no temporary typefaces or macros are present, the printer automatically performs a reset when you exit the Menus. If data is present in the buffer, a 10 RESET TO SAVE message is displayed; when you ▓Reset▓, the buffered data and temporary macros and typefaces are lost and the printer returns on line. See ▓Reset▓ in Table 2-3 for further information.
Factory	A *factory* default is the value set for each menu item at the factory; they are marked with asterisks (*) in the following Menu tables. See ▓Reset▓ in Table 2-4 for further information.

Printing Menu

You can override or change all items in the Printing Menu through your software application. If you change them through the control panel, they become the new permanent default value (see Table 2-6).

Table 2-7

Printing Menu Items

Item	Options	Definitions
COPIES	1* to 999	You can select from 1 to 999 copies. Scroll increment is 10 copies. (Hold down [+] to scroll.
PAPER (Envelope)	A4*, EXEC, LETTER, LEGAL, (COM10 MONARC, DL)	This sets the default image size at which the page (or envelope) is formatted unless a software command overrides it. Supported media sizes are given in Chapter 3, "Paper Handling and Printing."
OUT BIN	TOP*, BTM	Directs output to the selected bin.
ORIENTATION	P*, L	**P**, the default, stands for portrait (vertical) orientation, **L** for landscape (horizontal) orientation. (See "Orientation" in Chapter 4, "Using Type.")
FORM	64 LINES* (5–128 lines)	Sets vertical spacing for the default paper size, such as FORM=64 LINES. Minimum length is 5 lines; maximum is 128 lines. The scroll increment is 10 (hold down ▓▓ to scroll).

*Indicates factory default.

2 Printer Control Panel

Table 2-7 (cont.)

Printing Menu Items (continued)

Item	Options	Definition
MANUAL FEED	OFF*, ON	When MANUAL FEED is ON, the printer goes off line when a print job is sent and displays either MF FEED [Paper Size] or ME FEED [Envelope Size]. Press ▓▓▓▓ to manually feed the media. To override a manual feed request, press ▓▓▓▓.
JOB OFFSET	OFF*, ON	When JOB OFFSET=ON*, print jobs are separated from one another by shifting the output by about ¾-inch to the side. JOB OFFSET is applicable only to the upper output bin.
RET	ON*, OFF	Turns Resolution Enhancement ON or OFF.
DUPLEX[1]	OFF*, ON	Selects whether printing occurs on both sides (duplex) sides or just the front side (simplex) of the paper.
BIND[2]	LONG EDGE* SHORT EDGE	Adjusts the positioning of the printed image on the duplex page to allow document binding along the chosen edge.

*Indicates factory default

1 Appears only if the duplex option is installed.

2 Appears only if the duplex option is installed and DUPLEX=ON*

Resolution Enhancement

Resolution Enhancement technology (REt) refines the print quality of characters and graphics by "smoothing" the fine gradations along the angles and curves of the printed image. Figure 2-3 shows two magnified images; the left one shows Resolution Enhancement set to OFF, and the right one set to ON.

Figure 2-3
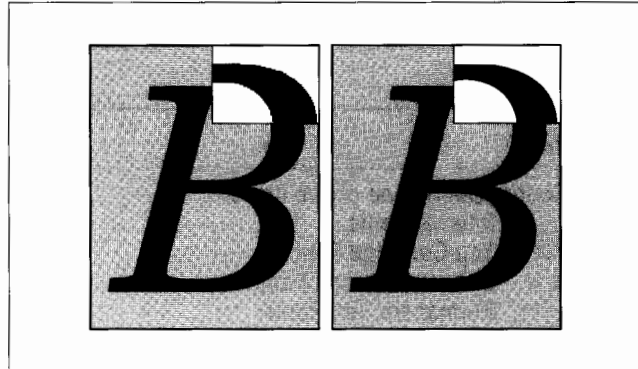
Resolution Enhancement Examples

The resolution enhancement option has only two choices: OFF and ON. The factory default setting is ON. In some printing situations you may find that OFF works better for your printer or density setting.

PCL Menu

PCL Menu items enable you to choose the printer's default font and symbol set. Printer Control Language (PCL) is HP's printer language. You can change PCL Menu items such as the FONT SOURCE through your software application (see Table 2-8).

Table 2-8

PCL Menu Items

Item	Options	Definitions
FONT SOURCE	I*, TOP, BTM, S, Mn	Font Source can be one of five items: I: Internal Fonts. TOP: Top Cartridge Fonts. BTM: Bottom Cartridge Fonts. S: Permanent Soft Fonts: Mn: SIMM Module: n=slot number. Typefaces stored in one of the four ROM SIMM slots (M1= slot 1, for example). See Appendix F, "SIMM Board Installation," for a description of the slot locations.
FONT NUMBER	0–999	The printer assigns a number to all typefaces and lists them on the PCL Typeface List. *Use the Font# (the number your software uses to select a font), not the Font ID (printer's number).* Refer to Figure 4-9 on page 4-25. You must first select a FONT SOURCE before a FONT NUMBER appears. Defaults and other conditions are given below: I: 0* is default. TOP: 0* is the default for a marked cartridge; 1* for an unmarked cartridge. BTM: 0* is the default for a marked cartridge; 1* for an unmarked cartridge. S: 1* is the default. Do not use the ID number assigned to the soft typeface when downloaded. Only permanent soft typefaces which are in the printer currently are selectable from the control panel. Mn: SIMM Module: n=the SIMM slot (1–4).

*Indicates factory default.

Table 2-8 (cont)

PCL Menu Items (continued)

Item	Options	Definition
PITCH or PT. SIZE	.44 to 99.99 (10.00*) 4.0 to 999.75 (12.00*)	The pitch or point size item availability depends on the FONT SOURCE and FONT NUMBER chosen. Pitch: For fixed pitch outline typefaces, you can select pitch sizes from .44 to 99.99. The scroll increment is 1.00 (hold down ▓ to scroll up or ▓ to scroll down). Point: For proportionally spaced outline typefaces, you can select point sizes from 4.0 to 999.75 in .25-point increments. The scroll increment is 1.00 (hold down ▓ to scroll up or ▓ to scroll down.
SYM SET	ROMAN-8*, etc.	A symbol set is a unique grouping of all the available characters in a font. For a list of symbol sets that are supported by your selected typeface, see Appendix B, "Symbol Sets." For an explanation of symbol sets, see Chapter 4, "Using Type."

* Indicates factory default.

2 Printer Control Panel

Job Menu

You can change Job Menu items through your software application
(see Table 2-6, "Control Panel Defaults").

Table 2-9

Job Menu Items

Item	Options	Definition
PAGEPROTECT	OFF* LTR, A4, LGL	Most print jobs run with page protection off. Page protection reserves additional memory for the page image process, allowing the printer to create the entire page image (in memory) before physically moving the paper through the printer. If you get a 21 PRINT OVERRUN message, setting a value for page protection can enable you to print complete pages. If your printer lacks adequate memory to implement page protection, a clearable warning message may be displayed (see CLR WARN in the Config Menu in this chapter, and "Clearable Warnings" in Chapter 7, "Troubleshooting"). See "Page Protection" following the Job Menu table for more information.
RESOLUTION	300 or 600*	600 dpi (dots per inch) is the default. If 600 dpi is selected, as much as 4 times more memory may be required to format a page than at 300 dpi. For most purposes, use 600 dpi. Some bitmapped fonts and graphics designed for 300 dpi printing may have better quality at the 300 dpi setting. See "Resolution" following this table for more information.

*Indicates factory default.

Table 2-9 (cont.)

Job Menu Items (continued)

Item	Options	Definition
PERSONALITY[1]	AUTO*, PCL, POSTSCRIPT	Your printer can have "personalities" (printer languages) other than HP's standard PCL personality. You can install the Adobe PostScript language, for example, as a SIMM board (see Appendix F, "SIMM Board Installation"). If PERSONALITY is set to AUTO* (the default), the stream of data sent to the printer is analyzed to determine which language is used by the print job, and the printer's personality automatically switches to that language. If another personality is made the default, then the printer is dedicated to that personality (PostScript, for example) but still switches personalities using PJL if your software specifically requests it.
TIMEOUT	15* (5 to 300)	Timeout, measured in seconds, refers to the time the printer waits before ending a print job. The default value is 15. The scroll increment is 10 (hold down ▓▓ to scroll).
		If, when using multiple ports, data from other ports appears in the middle of your print job, increase the timeout value.

* Indicates factory default.
1 This menu item appears only if a second language option is installed.

2 Printer Control Panel

Page Protection

A page's complexity (rules, graphics, or dense text) may exceed your printer's ability to create the image rapidly enough to keep pace with the printing process. If a page is too complex, only part of the page may print and you may lose some print data. In such cases, a 21 PRINT OVERRUN message (signifying possible loss of print data) appears in the display. (Refer to the printer message explanation in Chapter 7, "Troubleshooting.")

Note	The default is PAGEPROTECT=OFF*. Unless you frequently receive 21 PRINT OVERRUN messages or are printing a full legal page in the PostScript language, *you may not need to set a value for page protection.*

Page Protection reserves additional memory for the page image process, allowing the printer to create the entire page image in memory before paper starts through the printer. This reduces total printer performance, but it ensures the entire page is printed. When you set a value for page protection, it cannot take effect until the printer is reset or an end-of-job is encountered.

Page protection and resolution are linked. The memory required for page protection is dependent upon the resolution selected: a 600-dpi page can take *up to 4 times* more memory than 300-dpi page. *If you use page protection, set it for the paper size you use most often. Be sure you have sufficient installed memory for the option you select.* See Table 2-1 on page 2-8.

The page protection default value can be replaced by software and other data stream commands. The printer's memory is reconfigured each time the page protection level is changed. For example, if the page protection default is LGL and resolution is set for 600 dpi, a command from your software application can set page protection to LTR to print a complex job.

When the printer reconfigures how its memory is allocated, personality (PCL or PostScript) information and user-downloaded data such as typefaces, macros, and user-defined symbol sets and fill patterns are purged from the printer's memory, unless Resource Saving is activated. If the requested parameters cannot be satisfied,

a clearable warning message replaces the 00 READY message until
you acknowledge the warning by pressing **Continue** or, if CLR WARN
is set to JOB, until the printer receives the next print job.

Resolution

When resolution (either 300 or 600 dpi) is reconfigured, the new
resolution takes effect on the next print job or control panel reset.
The printer's personality (PCL or PostScript) memory also is
reconfigured. When memory is reconfigured, user-downloaded data
such as typefaces, macros, and user-defined symbol sets and fill
patterns are purged from the printer's memory unless Resource
Saving is activated.

Your printer offers greatly improved print quality using 600 dpi
resolution. To take best advantage of 600 dpi printing, use the 45
internal typefaces (or accessory scalable type) and new software
drivers designed for your printer.

If you are using older HP accessory cartridges, such as Pro Collection
(HP part number 92286PC), Microsoft Bitmapped Cartridge (HP part
number 2053A #C01), or other bitmapped images which were
designed for 300 dpi printing, you can use these accessories in either
300 dpi or 600 dpi mode. Although your printer automatically prints
the information on these cartridges at 600 dpi, for best print quality,
we recommend that you set your printer to 300 dpi resolution with
REt on.

Because your HP LaserJet 4Si printer is designed for 600 dpi
printing, your 300 dpi documents look almost as good as your 600 dpi
documents.

Refer to Table 2-1 on page 2-8 for memory requirements when
printing with 600 dpi resolution.

Personality (Printer Language) Switching

You can select a printer language (such as PCL or PostScript) one of three ways:

- Control panel PERSONALTY setting.

- PJL (Printer Job Language) software switching, using PJL commands embedded in software.

- Context (automatic) language switching.

  Through the control panel Job Menu's PERSONALTY item, you can set the printer's language to either AUTO or the language of your choice (PostScript or PCL). If PostScript is selected as the default, then the printer cannot use context switching, and PCL jobs that are not accompanied by PJL instructions cause PostScript errors.

  Context language switching is employed for most languages (including PCL and PostScript) if AUTO (the factory default) is selected. Under AUTO, the printer analyzes the stream of data sent to determine which language is used by the print job, and the printer's personality *automatically* switches to that language. *If the personality is switched, the printer's memory is reconfigured and all user-downloaded data such as typefaces are lost unless Resource Saving is activated.* If a "personality" (PostScript, for example) is made the default, then the printer is dedicated to that personality and switches personalities only when it encounters specific PJL commands embedded in software (for more information about PJL commands, see Appendix A, "Printer Commands").

Configuration Menu

Configuration Menu (Config Menu) items *cannot* be temporarily
changed by your software application (see Table 2-6).

Table 2-10

Config Menu Items

Item	Options	Definition
LOCK	NONE*, UC, LC	Trays can be locked out of the paper selection process. NONE: No trays are locked out. UC: The upper tray is locked out. LC: The lower tray is locked out.
CLR WARN	ON*, JOB	A clearable warning indicates a temporary condition in the printer. When CLR WARN is set to ON (the default), the last clearable warning message displayed replaces 00 READY until you press ▒▒▒▒▒▒. When set to JOB, the message remains until the next print job is sent. When a clearable warning message is present, the printer still functions since it is still on line. A number of clearable warning messages may be displayed for each job, depending on the length and complexity of the job. See "Clearable Warning Messages" later in this chapter for more detail.
AUTO CONT	ON*, OFF	The auto continue function determines how the printer reacts to data and printer errors. If AUTO CONT=OFF*, the printer displays a printer message and goes off line until you press ▒▒▒▒▒▒. If AUTO CONT= ON* (the default), the printer displays a printer message and goes off line for about 10 seconds, then returns on line. If your printer is part of a network or remote spooling system, use the default AUTO CONT=ON*. See "Auto Continue" later in this chapter.

* Indicates factory default.

2 Printer Control
Panel

Table 2-13 (cont.)

Config Menu Items (continued)

Item	Options	Definition
LOW TONER	STOP*, CONT	This determines how the printer reacts when 16 TONER LOW messages are displayed. For TONER LOW=CONT, if the printer senses the cartridge is running out of toner, the 16 TONER LOW message appears in the control panel display but the printer remains on line and continue to print, although print quality may degrade. TONER LOW=STOP* (the default) the printer goes off line and waits for the operator to intervene. See "Clearing the TONER LOW Message" in Chapter 6, "Maintenance and Adjustments," for further information.

*Indicates factory default

Lock

The Lock function enables you to *lock out* one or more trays from the paper selection process. *It is particularly useful in a shared or networked environment.* For example, you can store letterhead paper or other special media (colored paper, labels, or transparencies, for example) in a less-frequently-used tray, then lock it out of the printer's default system. It is then excluded as a default input source, and you must specifically select the locked tray through your application software. (For more information, see "Using the Lock Function" in Chapter 3, "Paper Handling and Printing.")

Note

Your word processor or other software application should be able to select a locked tray. If you have an older printer driver, you may not be able to use the Lock function.

Clearable Warning Messages

A clearable warning indicates a temporary condition in the printer. The printer will continue on line while the message is displayed in place of 00 READY (press **Continue** to clear). A clearable warning appears each time the printer alters resolution or page protection (this causes reconfiguration of memory), aborts a job due to an invalid or uninstalled personality, or encounters a similar condition. A number of clearable warnings can appear during the course of printing a job.

Clearable warnings are necessary because the printer may automatically reduce the requested level of complexity when attempting to process your print job. You may observe some loss of quality in whole documents or portions of pages.

Certain messages indicate that the printer automatically selected the most efficient way to reconfigure its memory to print the job. For example, W5 JOB 300/LTR means that the printer reduced resolution to 300 dpi and set page protection to letter. (See Chapter 7, "Troubleshooting," for a list of messages and information about reconfiguring your printer to adjust for the clearable warning condition.)

The printer first attempts to satisfy the print request by reducing resolution, then by lowering the level of page protection, then by compressing the data if possible. If it receives a job for an uninstalled personality (such as PostScript) or requires more memory than available, the job is aborted.

Caution   A clearable warning message indicates that the printer may have purged all downloaded typefaces and macros and buffered data. To avoid this condition, see the discussions of memory allocation under "Page Protection" and "Resource Saving" earlier in this chapter).

Auto Continue

Auto continue refers to the way several printer messages are handled:

- When you select AUTO CONT=ON, several non-critical printer messages appear on the display for about 10 seconds. Then, the 00 READY message appears and the printer resumes printing.
- When you select AUTO CONT=OFF, a printer message remains in the display until you tell the printer to continue. For example, if the 20 MEM OVERFLOW message appears, the printer *stops printing* until you press **Continue** to return the printer on line.

Note   If your printer is part of a network or remote spooling system, keep the default AUTO CONT=ON. If you need to diagnose printer problems, then operate the printer with AUTO CONT=OFF so that you can review messages and make corrections. (See Chapter 7, "Troubleshooting" for more information.)

Memory Configuration Menu

The Memory Configuration menu enables you to set Resource Saving ON or OFF, and to specify the amount of memory reserved for each environment.

Table 2-11

Memory Config Menu Items

Item	Options	Definition
RESORCE SAV	ON, OFF*	Enables or disables the Resource Saving feature. If set ON, additional memory management item selections appear. The default is OFF*.
PCL MEM XXXXXK PS MEM XXXXXK	0 to 9900 KBytes	If Resource Saving is ON, this item appears for each installed personality (such as PCL and PostScript). Memory can be increased in blocks of 100 KBytes up to the maximum available printer memory (this varies, depending on other memory configurations and requirements). Resource Saving takes minimum environment requirements into consideration. PostScript, for example, requires a minimum 900 KBytes, so this appears as the initial setting when Resource Saving is activated. Increasing the reserved memory from PS MEM 0 K by one click results in PS MEM 900K.

*Indicates factory default.

Refer to the discussion of Resource Saving on page 2-12 for further memory considerations.

Note   The Test Menu is not accessible if Resource Saving is reconfigured but not saved. This prevents erroneous memory configuration information from printing on the self-test page.

Press   and   to save the new memory configuration.

Parallel Menu

Parallel Menu items cannot be changed temporarily by your software application (see Table 2-6). For more information about interfaces, see Appendix D, "Printer Interfaces."

Table 2-12

Parallel Menu Items

HIGH SPEED	YES*, NO	High Speed refers to the speed data is transmitted to the printer. YES, the default, can be used in most cases to enhance data transfer speed. If you suspect data transmission problems, select NO, which may be compatible with slower, older computers.
ADV FNCTNS	YES*, NO	Choosing ADV FNCTNS=ON enables bi-directional parallel communication, which allows your printer to send status readback messages to your computer. (Note that ADV FNCTNS=ON may slow personality switching; see Chapter 5, "PostScript Printing.")

*Indicates factory default.

Test Menu

Test Menu items can be accessed only through the control panel. For more information about Test Menu items, see the descriptions which follow this table. For PostScript language pages, see Chapter 5, "PostScript Printing."

To print test pages:

1 Press ▓▓▓▓ until TEST MENU appears in the display.
2 Press ▓▓▓▓ until the desired item appears.
3 Press ▓▓▓▓ to print the item.
4 Press ▓▓▓▓ to return the printer on line.

Table 2-13

Test Menu Items

Item	Definitions
SELF TEST	The printer first runs a self test, during which time 05 SELF TEST is displayed and all control panel lights are on. 06 PRINTING TEST is displayed during the printing portion of the self test. See the following page for a description of the self test page.
CONT SELF TEST [Continuous Self Test]	Prints continuous self test pages until you press ▓▓▓▓ or ▓▓▓▓ (the 04 portion of the display blinks and several more pages print until the buffer is cleared). The printer first runs a self test, during which time 04 SELF TEST is displayed and all control panel lights are on. When the Ready light begins to blink, the printer will begins printing self test pages. Press ▓▓▓▓ when printing has finished.
PCL TYPE LIST	See Chapter 4, "Using Type," for a description.
PCL DEMO PAGE	The PCL Demonstration page is designed to illustrate the features of your printer. A sample PCL Demonstration page is shown on page 2-43.

Printer Self Tests

When you run a Self Test, the printer checks its internal controller and I/O interfaces, then prints a test page.

Understanding the Self Test Printout

Figure 2-4 shows a sample of the Self Test printout. (The appearance of the Self Test page will change slightly with different options.)

Self Test Printout Items

Item Explanation

1   Standard Menu Selections: Shows standard menu selections in the order they appear in the control panel display.

2   PostScript and Optional Menus: Shows optional menu selections, such as the PostScript Menu, and menu items, such as PRT PS ERRS, in the order they appear in the control panel display. An optional menu automatically is added to the control panel display and Self Test printout after the option is added to the printer.

3   MIO1/MIO2 Menu: If a Modular I/O is added, it appears following the Parallel Menu in the Self Test and control panel display after the option is installed.

4   MIO Information: Reserved for MIO and Network statistics. Note that for some installed MIO options, this block of information can take up to 20 lines and three columns.

5   Serial Number: Shows the printer's serial number.

6   RAM Size: Shows the total amount of installed printer memory, including added optional memory. Two Mbytes of installed memory is standard with the printer. If you install optional memory, you can use a self test to verify proper installation.

7   Page Count: Shows how many pages have been printed. Use the page count to track printer usage. The page count is always updated.

8   Datecode: Eight-digit date (YYYYMMDD) indicating when the formatter firmware was last revised. This information may be of use to a service technician.

9   Other Installed Options: Use this area of the self test to verify the installation of typeface cartridges, paper trays, personalities, and other installed options.

10   Resource Saving: Shows the amount of memory allocated for resource saving.

11   Print Pattern: Use the text print pattern to check print density and quality.

Figure 2-4

Self Test Printout

PCL Typeface List

The PCL Typeface List printout is a list of the scalable typefaces and bitmap fonts currently available to your printer in the PCL language. The PCL Typeface List is described in Chapter 4, "Using Type." For PostScript typefaces, see Chapter 5, "PostScript Printing."

PCL Demo Page

The PCL Demo Page (see page 2-43) is designed to demonstrate the features and print quality of your printer.

Figure 2-5

PCL Demo Page

Changing the Control Panel Display Language

The default control panel display language is set for English.
Supported languages are: English, French, German, Italian, Spanish,
Finnish, Danish, Dutch, Swedish, Norwegian, and Portuguese.
Follow these instructions to change the display language.

1 Switch OFF the printer.

2 Press and hold ▓▓▓▓ while switching ON the printer until
CONFIG LANGUAGE appears in the display.

3 After the power-on 05 SELF TEST, LANG=ENGLISH appears. Press ▓
until the desired language appears in the display.

4 Press ▓▓▓▓ to save your choice. An asterisk (*) appears next to
the language to indicate it is now the default.

5 Press ▓▓▓▓ . The On Line indicator is lit, and display
messages are now be in the language you selected.

3

Paper Handling
and Printing

You can use your printer for many more printing operations than standard A4-size, portrait orientation pages. You can:

- Print in different orientations.
- Send your output to stack either face down (correct order) or face up (reverse order).
- Print from two large capacity paper trays in legal, executive, or letter sizes.
- Print on nonstandard sizes and weights of paper using the manual feed feature.
- Print envelopes.
- Print directly on overhead transparencies.
- Print sheets of adhesive labels.
- Print duplex (printing on both sides of the page) if you installed the duplex option.
- Use the paper sensor arm to detect upper bin full conditions.
- Offset print jobs.

Setting the Page Orientation

Page orientation refers to the direction of print on the page. Using the printer, you can print across the page width (portrait and reverse portrait orientation). You also can print across the page length (landscape and reverse landscape orientation).

Many software applications enable you to select orientations. Refer to your software documentation for instructions.

You also can select page orientation by sending these printer commands, either directly or by embedding them in your text (see "Embedded Printer Commands" in Appendix A):

^{E}C&ℓØO — Sets Portrait Orientation
^{E}C&ℓ1O — Sets Landscape Orientation
^{E}C&ℓ2O — Sets Reverse Portrait Orientation
^{E}C&ℓ3O — Sets Reverse Landscape Orientation

Where ^{E}C is the escape control character.

You can select regular portrait or landscape orientation from the control panel Printing Menu. (Reverse portrait and reverse landscape can be selected only by your software application or by printer commands.)

Portrait orientation is the printer's factory default setting.

Note   If you have the PostScript option, see your software application manual for page orientation information.

Figure 3-1 shows the four orientations.

Figure 3-1
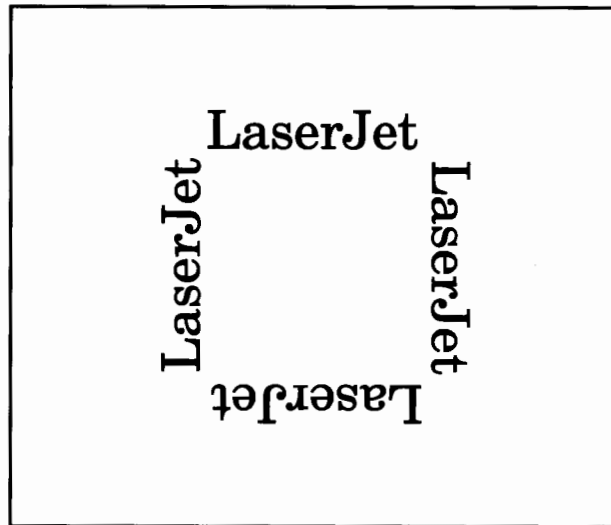
The Four Orientations

Note

Figure 3-1 is provided only to illustrate the four orientations. Sending a page orientation command returns all margins and the lines-per-inch setting to the orientation default (and, if there is data in the print buffer, causes a page eject). Images such as Figure 3-1 can be created, however, using other PCL 5^e and PostScript commands for changing *print direction* on the page.

Landscape Orientation Example

A common application for landscape orientation is printing spreadsheets. This example shows how to print a Lotus 1-2-3 spreadsheet in the landscape orientation.

1 Take your printer off line.
2 Press and hold the ▓▓▓ keys for several seconds until RESET=MENU* appears in the display.
3 Press ▓▓▓. The message 09 MENU RESET appears briefly, and the printer returns on line.
4 Load the Lotus 1-2-3 program.
5 Press **/** **F**ile **R**etrieve.
6 Enter the file name of the spreadsheet and press the **Enter** key on your computer keyboard.
7 Press **/** **P**rint **P**rinter **O**ptions **S**et-up and enter the printer command for Landscape, $^{E}c\&\ell 1O$, thus:

27&ℓ1O

(Lotus 1-2-3 recognizes 27 as the code for the escape character.)

8 Verify that you have entered the command properly, then press the **Enter** key.
9 Press **P**age Length, enter 45, and press the **Enter** key.
10 Press **M**argins **R**ight, enter 106, and press the **Enter** key.
11 Press **Q**uit.
12 Press **R**ange, enter the desired print range, and press the **Enter** key.
13 Return your printer on line.
14 Press **A**lign and **G**o to print the spreadsheet.

Some releases of Lotus 1-2-3 do not send a form feed command to the printer following the end of data. Therefore, you may need to take the printer off line and press the ▓▓▓ key to eject the last page of your spreadsheet. You also can use the **P**age command in the Lotus 1-2-3 printer menu.

Paper Tray Selection

Your printer has two 500-sheet paper trays. By default, paper is pulled from the upper tray. Paper is pulled from the lower tray when the:

- upper tray runs out of paper.
- upper tray is not present.
- lower tray is selected by your software application.
- selected paper size tray is in the lower slot

The display message UC (upper) or LC (lower) TRAY EMPTY tells you that a tray is out of paper, or is not present, or is not inserted all the way.

Lock is a feature that enables you to lock out a paper tray from the paper selection process. It is useful in a shared or networked environment. For example, you can store letterhead paper or other special media (colored paper, labels, or transparencies, for example) in the less-frequently-used tray, then lock it out of the printer's default system. Since you exclude it as a default input source, you must specifically select the locked tray. (For more information, see "Lock" under "Config Menu" in Chapter 2, "Printer Control Panel.")

For example, to use Lock to establish the lower paper tray as a protected source of letterhead paper:

1 Place letterhead or other media in the lower paper tray.

2 Lock out the lower paper tray:

   a Press **On Line** to take the printer off line.
   b Press **Menu** repeatedly to cycle to the CONFIG MENU.
   c Press **Item** until LOCK=NONE*, the default, appears.
   d Press **+** to cycle to LOCK=LC and press **Enter**. This will lock out the lower paper tray from the media input source selection process.
   e Press **On Line** to return the printer on line.

The printer only draws media from the lower paper tray if a specific software request is made for the lower paper tray.

Paper Tray Selection Using Printer Commands

If your software driver does not directly support tray selection for the
printer, and your software enables you to embed printer commands,
use the following:

^{E}c&ℓ1H – Selects Upper Paper Tray

^{E}c&ℓ4H – Selects Lower Paper Tray

^{E}c&ℓ6H – Selects Optional Envelope Feeder (and must be
used in combination with an Envelope Size printer
command; see Appendix A, "Printer Commands").

Output Order Selection

You can choose to stack your printed pages in either of two
arrangements:

- Correct order: Pages exit the printer to the upper output bin and
stack face down. (This is the typical output order.)

- Reverse order: Pages exit the printer to the lower (rear) output
bin and stack face up, in reverse order (the last page printed is
out on top).

Pages exit to the lower (rear) output bin automatically if the rear bin
panel is lowered. You also can select the rear output bin by the
following software command:

^{E}c&ℓ2G

To reselect the upper bin, use the software command:

^{E}c&ℓ2G

3 Paper Handling and Printing

Lower (Rear) Bin Use

To open and select the lower (rear) output bin for face-up (reverse order) output:

1 Ensure there is sufficient clearance behind the printer to output and stack the media.
2 Push the press-and-release latch located near the top center of the back of the printer, shown in Figure 3-2. The door springs open. Lower the bin panel to its resting position and fully extend the folded panel outward.

You can select the lower bin through most software applications. Printer output exits face up and in reverse order. If, the bin you select is not in the open position, paper exits from the slot at the base of the lower bin door.

Subsequent print jobs continue to output from the lower (rear) bin until you change the control panel Printing Menu selection or your software application selection.

Figure 3-2
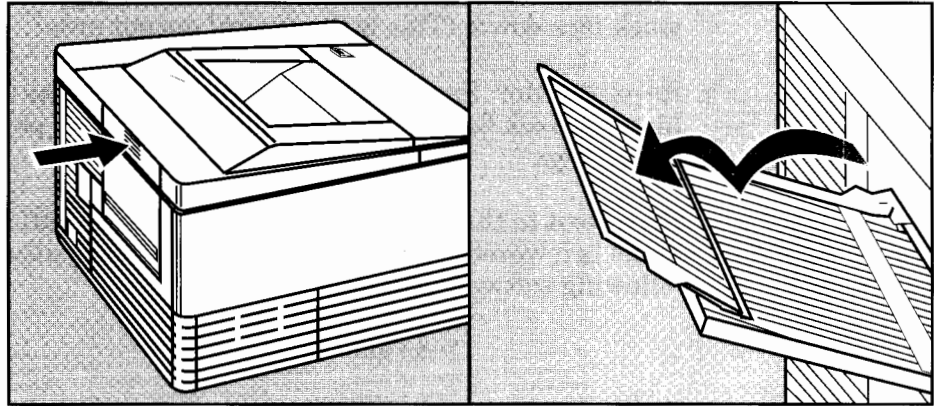
Opening the Lower (Rear) Output Bin

Using Manual Feed

The manual feed feature enables you to:

- Print nonstandard sizes of paper, envelopes, labels, and transparencies.
- Print an occasional page of special paper (such as letter-head) without loading a paper tray.
- Print small volumes of special media.

Network Note   If your printer is connected to a network or other shared printer environment, check with your printer administrator for manual feed protocols. Remember that your printer is shared with other users.

You can manually feed media within the following size ranges:

	Metric	English
Upper Tray		
minimum width	98 mm	3.9 inch
minimum length	190.5 mm	7.4 inch
maximum width	216 mm	8.5 inch
maximum length	355 mm	14 inch
Lower Tray		
minimum width	98 mm	3.9 inch
minimum length	230 mm	9 inch
maximum width	216 mm	8.5 inch
maximum length	355 mm	14 inch

3 Paper Handling and Printing

You can print using manual feed four ways:

- Inserting a single sheet of media directly into the paper tray guides.
- Specifying manual feed in your software application.
- Sending a printer command from your software.
- Selecting manual feed from the control panel.
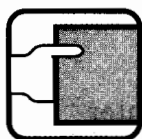
Manually Printing Single Sheets

You can print using the manual feed guides in either the upper or lower paper tray (see Figure 3-3 and Figure 3-4). The printer selects a sheet of media as follows:

- The upper tray is the default.
- If there is no media in the upper tray's manual feed guide, the printer automatically searches for media in the feed guide of the lower tray.

If you select MANUAL FEED=ON* from the control panel's Printing Menu or through your software, you must manually feed media.

You can print single pages of the same size (such as letterhead stationery) without first setting manual feed. Adjust the paper guides and insert the media fully forward until you feel it stop. Do not push the paper further; the printer pulls the inserted paper forward when ready. When the printer receives data, it selects the media from the proper manual feed tray.

To manually print multiple sheets (or envelopes or other media), first set MANUAL FEED=ON* from the control panel's Printing Menu or through your software.

Selecting Manual Feed Using Printer Commands

Select manual feed by sending this printer command:

E_C&ℓ2H

This command returns the printer to automatic tray feed:

E_C&ℓ1H
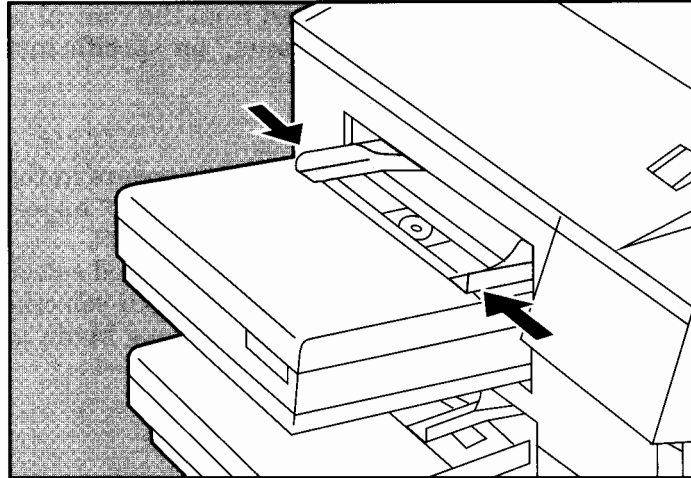
Figure 3-3

Adjusting the Manual Feed Guides

Figure 3-4

Manually Feeding Paper

3 Paper Handling and Printing
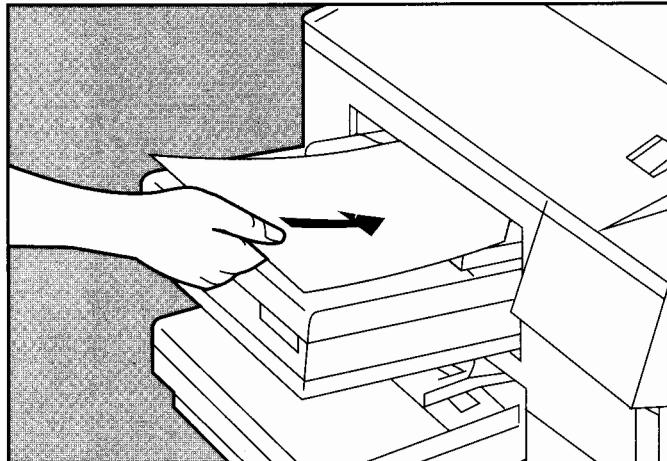
Selecting Manual Feed From the Control Panel

You also can select manual feed from the control panel. (See
Chapter 2, "Printer Control Panel," for specific instructions about
control panel use.)

1 Take the printer off line.
2 Press the **Menu** key. PRINTING MENU appears in the display.
3 Press **Item** six times until MANUAL FEED=OFF appears in the display .
4 Press the **+** key to display MANUAL FEED=ON.
5 Press the **Enter** key to set your manual feed selection. (An asterisk
"*") appears in the display, indicating your selection is set.)
6 Press the **On Line** key to exit the Printing Menu and return the
printer on line.
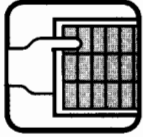
Example—Printing Using Manual Feed

Use the same procedure for printing paper, labels, or overhead transparencies on the printer. The only exception to this procedure is using the bin full sensor arm; refer to "Using the Bin Full Sensor Arm with Transparencies and Labels" on page 3-26.

1 Select manual feed using a printer command or from the control panel. The Manual indicator lights.
2 Send data from the computer to the printer. (The printer goes off line and the Form Feed indicator lights. MF FEED A4 appears in the display.)
3 Adjust the manual feed guides to the width of the media (see Figure 3-3).
4 Slide a sheet of media into the top of the paper tray between the manual feed guides until it stops (see Figure 3-4). For simplex (single-sided) printing on letterhead stationery, insert the letterhead edge first, face up. For duplex printing, insert the bottom of the page first, the letterhead face down.
5 After a momentary pause, the On Line indicator lights and the page is pulled into the printer. If your job requires more than one sheet of paper, wait until MF FEED A4 appears in the display before inserting the next sheet of paper. Repeat this process until your job is done.
6 Exit manual feed by changing your software setting, by sending a printer command, or by resetting the control panel Printing Menu to MANUAL FEED=OFF*.

Caution   Not all commercial transparencies and printing labels are suited for this printer. Refer to Appendix E, "Media Specifications," and the *HP LaserJet Printer Family Paper Specification Guide* for information about selecting label and transparency stock.

3 **Paper Handling and Printing**
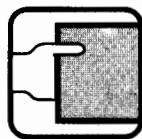
Manually Feeding Legal-Sized Paper

If a legal-size paper tray is not available, manually feed the legal-size paper. (The following example assumes the printer is currently set to factory default values.)

To manually feed legal-sized pages:

1 Take the printer off line.
2 Press the [Menu] key. PRINTING MENU appears.
3 Press [Item] repeatedly until PAPER=A4 appears in the display. The asterisk indicates this is the current setting.
4 Press the [+] key until PAPER=LEGAL appears in the display.
5 Press the [Enter] key to set the legal-sized paper selection. (An "*" appears in the display, indicating your selection is set).
6 Press the [Item] key until MANUAL FEED=OFF appears in the display.
7 Press the [+] key to display MANUAL FEED=ON.
8 Press the [Enter] key to set the manual feed selection. (An "*" appears in the display, indicating your selection is set. The Manual Feed indicator also lights.)
9 Press the [On Line] key to exit the Printing Menu and return the printer on line. The manual fed indicator will light.
10 Send data to the printer.
11 The printer goes off line and MF FEED LEGAL appears in the display.
12 Insert a legal sheet of paper between the manual feed guides. Adjust the guides to the size of the paper (see Figure 3-3). Slide the paper into the printer until it stops (see Figure 3-4). For simplex (single-sided) printing on letterhead stationery, insert the letterhead edge first, face up. For duplex printing, insert the bottom of the page first, the letterhead face down.
13 The printer automatically picks up the sheet and prints.

Return to automatic feed by changing MANUAL FEED to OFF in your software application, by sending a printer command, or by changing the setting at the control panel.
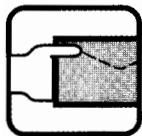
Manually Feeding Envelopes

You can manually feed and print envelopes if you do not have the optional envelope feeder. Monarch, COM-10, or DL envelopes are the standard sizes. C5 envelopes also can be manually fed, although this size envelope is not supported through the control panel.

To format correctly, envelopes must be printed in landscape orientation.

Note

Because of the various paper folds that make up an envelope, it is important to find envelopes that yield good print quality and do not cause paper jams. Refer to Appendix E, "Media Specifications" and the *HP LaserJet Printer Family Paper Specification Guide* for help in selecting a satisfactory envelope for your needs.

Example - Manually Feeding a DL Envelope Using Printer Commands

1 Use your software application to enter the following combined printer command:

   E_C&ℓ#a3h1O

   where # = envelope code. Substitute the appropriate envelope code for the # symbol in the printer command (see Table 3-1 on page 3-16). Use 90 for a DL envelope. In this example, the proper printer command is:

   E_C&ℓ90a3h1O

   which instructs the printer to print a DL size (...90a), manually-fed envelope (...3h), in landscape orientation (...1O).

Table 3-1

Envelope Commands

Envelope	Size	Embed this # in command:
Monarch	$3\frac{7}{8} \times 7\frac{1}{2}$ inch	80
COM-10	$4\frac{1}{8} \times 9\frac{1}{2}$ inch	81
DL	110mm $\times$ 220mm[1]	90

1 Sizes may vary slightly with manufacturer.

2 Now enter the addresses. (Allow for a small margin between the top and left edge of the envelope and the address. Printing very close to the edge of the envelope results in poor print quality. Refer to your software documentation or the *HP LaserJet Printer Family Paper Specification Guide* for more information on preparing data for envelopes.)

Figure 3-5
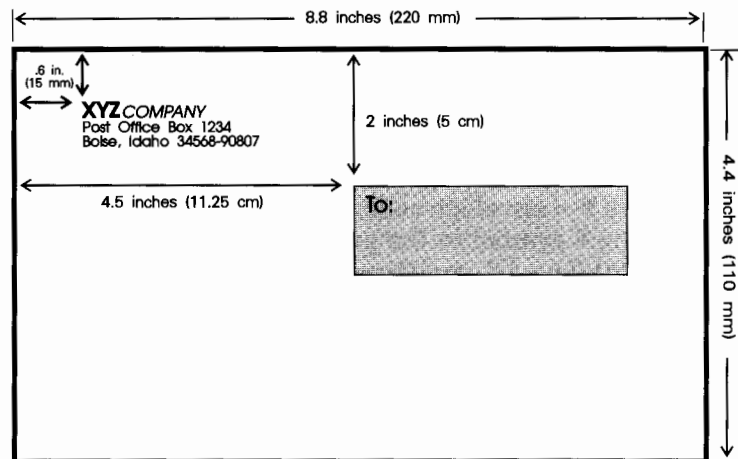
Setting Margins for a DL Envelope

3 Send the data to the printer.

4 The printer goes off line and displays ME FEED DL.

5 Adjust the guides to the size of the envelope (see Figure 3-3).

6 Ensure the leading edge of the envelope is flat before feeding to reduce jamming problems.

7 Slide a DL envelope between the manual feed guides until it stops. The proper orientation is:

• The side you want printed facing upward.

• The top edge of the envelope flush against the left manual feed guide.

Figure 3-6 illustrates the proper way to insert an envelope.

Figure 3-6
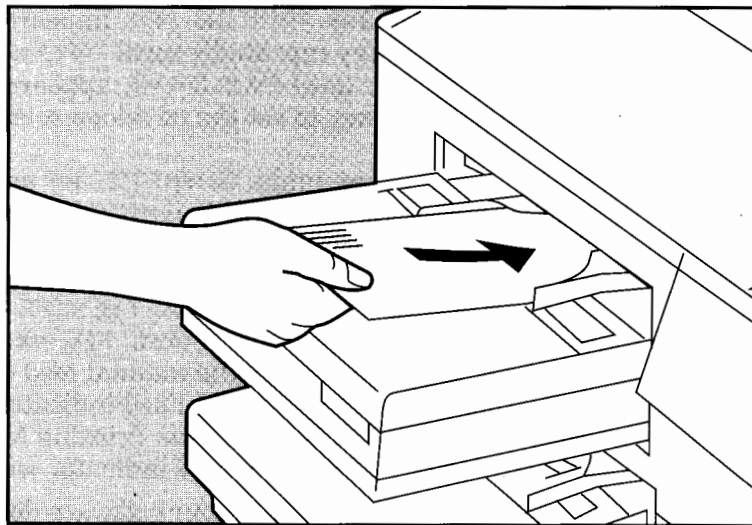
Manually Feeding an Envelope

To feed additional envelopes, wait for the ME FEED DL message to appear in the display again.

Example - Manually Feeding A DL Envelope Using the Control Panel

Note

The following example assumes the printer currently is set to factory default values.

In step 1 of the preceding example, you created a software command for manually feeding a DL envelope. If you cannot create or issue such a command with your software, you can still use the control panel to complete the task. Follow the instructions below to manually feed a DL envelope using the control panel:

1 Take the printer off line.
2 Press the **Menu** key. PRINTING MENU appears in the display.
3 Press the **Item** key repeatedly until PAPER=A4 appears in the display.
4 Press the **+** key until ENVELOPE=DL appears in the display.
5 Press the **Enter** key to set the envelope selection. (An "*" appears in the display.)
6 Press the **Item** key again. ORIENTATION=P appears in the display.
7 Press the **+** key to display ORIENTATION=L.
8 Press the **Enter** key to set the selection. (An "*" appears in the display.)
9 Press the **Item** key twice. MANUAL FEED=OFF appears in the display.
10 Press the **+** key to display MANUAL FEED=ON.
11 Press the **Enter** key to set the manual feed selection. (An "*" appears in the display and the Manual Feed indicator lights.)
12 Press the **On Line** key to exit the Printing Menu and return to on-line status. The manual feed indicator will light.

Note

This example works only if your software does not override your control panel selections.

Now continue from step 2 of the previous example to send your envelope data to the printer. Reset the menu items when you finish printing envelopes.

If you print envelopes frequently, consider purchasing an optional envelope feeder (HP part number C2060A), which holds up to 100 envelopes. The envelope feeder supports printing up to 3,000 envelopes per month. Refer to your HP authorized dealer for ordering information.

Refer to *HP LaserJet Printer Family Paper Specification Guide* for recommended sizes and weights of envelopes to use with your printer.

Troubleshooting Manual Feed

If you have trouble with manual feed, check the following:

- Is the printer control panel set up correctly?
- Have you entered your printer commands correctly?
- Is your software overriding the manual feed selection made from the control panel?
- Are you inserting the paper, transparency, or envelope far enough into the machine?
- Make sure the paper input tray is not overfilled; if so, you may need to reduce the amount of paper.

3 Paper Handling and Printing
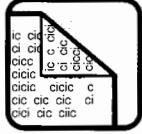
Duplex Printing

If you have properly installed the duplex option, you can print in duplex (two-sided) mode. To print in duplex, specify duplex printing in your software application or a printer command, or set DUPLEX=ON* through the control panel (this item appears in the Printing Menu only when the duplex unit is installed).

Duplex printing can be done in either portrait or landscape orientation and with long-edge or short-edge binding. Your printer automatically adjusts the page's margins to compensate for the binding option you select (see the section which follows).

Note
Use paper between 16 to 24 pound (60 to 90 g/m2) when printing in duplex mode. (Refer to the *HP LaserJet Printer Family Paper Specification Guide* for an explanation of the specifications).

Selecting Duplex Mode

To select duplex mode through your software package, see your software manual or the Software Application Notes that came with your printer. To select duplex mode through the control panel, see that section in Chapter 2, "Printer Control Panel."

See page 3-24 for the PCL 5e printer commands you can use to select duplex printing.

Binding Options

Before printing in duplex mode, determine how you want your finished document bound. Binding refers to the process of joining a stack of printed sheets using staples (stitches), three-hole binders, glue, or some other means. The orientation of the printed page affects binding setup. Four possible binding setups are described below (see Figure 3-7, and the discussion entitled "Common Uses for Binding Setups" on page 3-22).

Long-edge bound duplex pages are printed for joining along the length (longer dimension) of a rectangular sheet of paper. Short-edge duplex pages are printed for joining along the width (shorter dimension).

Figure 3-7
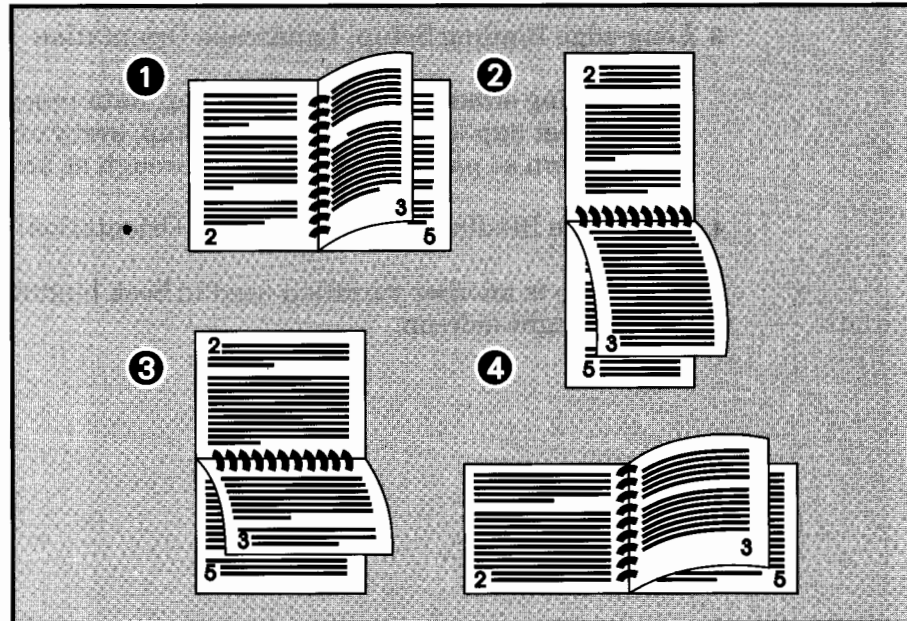
Binding Examples

Common Uses for Binding Setups

To help you decide which binding setup to use, review Figure 3-7 and the following information:

1 Long-edge Binding Setup, Portrait Orientation

   This is the conventional layout used in book binding.
   With this setup, every printed image is right-side-up.

2 Short-edge Binding Setup, Portrait Orientation

   This binding often is used with calendars. If short-edge binding in portrait orientation is selected, every other printed image is upside-down.

3 Long-edge Binding Setup, Landscape Orientation

   This binding often is used in accounting, data processing, and spreadsheet applications. With this setup, every other printed page is upside-down so pages can be flipped through as on a clipboard.

4 Short-edge Binding Setup, Landscape Orientation

   This setup is another variation used in book binding. Each printed image is right-side-up.

Duplex and Binding Examples

Selecting Duplex, Landscape, Short-edge Binding Using the Control Panel

The following example shows how to select duplex printing, in landscape orientation, with short-edge binding.

Note   The following example assumes the printer currently is set to factory default values.

1 Take the printer off line.
2 Press the **MENU** key. PRINTING MENU appears in the display.
3 Press the **Item** key several times until ORIENTATION=P* is displayed.
4 Press the **+** key to display ORIENTATION=L*.
5 Press the **Enter** key to make the selection. The display reads ORIENTATION=L*.
6 Press the **Item** key several times until DUPLEX=OFF* is displayed. The font asterisk indicates this is the current setting.
7 Press the **+** key to display DUPLEX=ON*..
8 Press the **Enter** key to make the selection. The display now reads DUPLEX=ON.
9 Press the **Item** key until BIND=LONG EDGE is displayed.
10 Press the **+** key to display BIND=SHORT EDGE*.
11 Press the **Enter** key to make the selection. The display now reads BIND=SHORT EDGE.
12 Press the **ON LINE** key to exit the Printing Menu and return to on-line status.
13 Send data to the printer.

Note   This example works only if your software does not override your control panel selections.

Selecting Duplex/Simplex and Binding Using Printer Commands

You can select duplex or simplex printing through your software application using PCL 5^e printer commands.
The commands are:

^{E}c&ℓ0S – for Simplex (single-sided) printing

^{E}c&ℓ1S – for Duplex, Long-edge binding setup

^{E}c&ℓ2S – for Duplex, Short-edge binding setup

The Bin Full Sensor Arm

The printer operates without the bin full sensor arm attached. If installed, it detects a bin full condition if the upper bin is full. When the upper bin is full, the bin full sensor prompts the printer to display the message OUTPUT BIN FULL. The printer prints the remaining pages stored in its buffer (up to four pages), and goes off line. The lower (rear) output bin will be locked out and the printer cannot default to the lower bin.

To clear this message, remove the paper stack from the upper bin. Be sure the sensor arm is in its lowered position. When the bin is emptied, the display clears (this may take several seconds), and the printer prints the remainder of the job.

If you frequently run large print jobs, the bin full sensor arm helps control the stacking of certain media. It is not recommended for use with lightweight media, such as 16 pound paper.

Installation and Removal

To install the bin full sensor arm:

1 Rotate the bin full sensor arm holder into the pulled-down position, and facing the front of the printer (see (A) in Figure 3-8).
2 Push the bin full sensor arm into the rectangular socket (see (B) in Figure 3-8).

To remove the bin full sensor arm:

1 Grasp the bin full sensor arm (see Figure 3-8) while holding the spring-loaded holder.
2 Pull the bin full sensor arm straight out. Do not twist or bend the sensor arm while removing it. It is not mechanically attached to the holder.
3 Let the holder rotate up to its rest position.

Figure 3-8
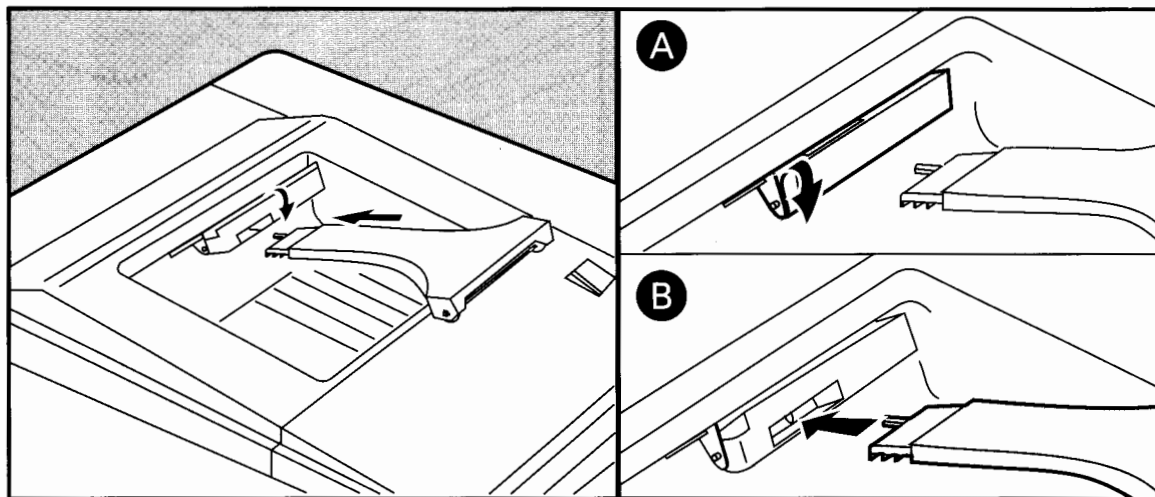
Sensor Arm Attachment

Using the Bin Full Sensor Arm with Transparencies and Labels

When outputting transparencies or labels to the upper output bin, attach the bin full sensor arm in the hole below the spring-loaded holder (see Figure 3-9). This helps reduce curling by the transparencies and labels.

If you have problems with excessive curl, sticking, or jams, remove each sheet from the output bin as it exits the printer.

Figure 3-9
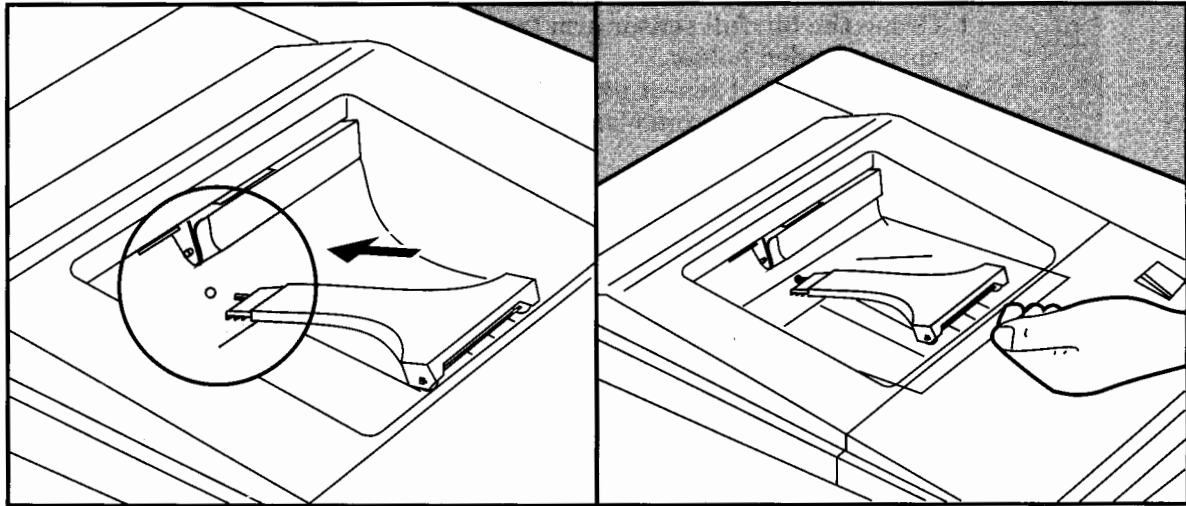
Sensor Arm Position for Transparencies and Labels

Job Offset

With the default JOB OFFSET=ON* in the Job Menu, your printer automatically separates (collates) jobs into groups by shifting the position of the paper stack (see Figure 3-10). The bin full sensor arm aids in stacking the paper.

Figure 3-10
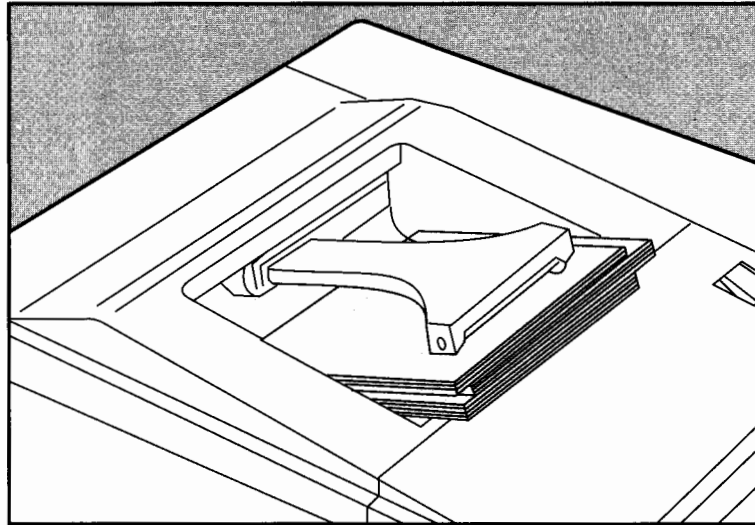
Job Offset Using Sensor Arm

4

Using
Type

Introduction

This chapter contains instructions for using the HP LaserJet 4Si printer's standard internal typefaces that run under the PCL language. (For information on using PostScript typefaces with this printer, see Chapter 5, "PostScript Printing.") The following topics are covered in this chapter:

- Internal Typeface Offering
- Intellifont and TrueType
- Screen Fonts for Windows
- Elements of a Font
- Using Printer Drivers
- Adding Support for Accessory Fonts to a Printer Driver
- Installing Type Cartridges
- Selecting Fonts through Software
- Selecting Fonts through the Control Panel
- Default Font
- Using Fonts on a Network
- Font Selection Priority
- The PCL Typeface List Printout
- Special Fonts and Services
  - Designing Your Own Soft Fonts and Macros
  - Special Application Fonts Available from HP
  - Hewlett-Packard Custom Font Services

Internal Typeface Offering

Your printer contains 45 internal scalable typefaces and a
16.67-pitch bitmapped Line Printer font (see Figure 4-1). This broad
selection of typefaces will support most types of office documents,
from spreadsheets and reports to letters, presentations, and
advertising literature.

DOS and Microsoft Windows Support

Whether your software runs under MS-DOS or Windows, you can
access any of the internal typefaces, along with hundreds of accessory
typefaces available through Hewlett-Packard and third-party
typeface vendors.

Available Type Sizes

Depending on the capabilities of your software, you can size the
proportionally spaced internal typefaces from .25 point to 999.75
points, in quarter-point increments.

The internal Line Printer font is only available in 16.67 pitch.
Courier and Letter Gothic are available in .5 pitch to 85.7 pitch.

4 Using Type

Figure 4-1

Intellifont

Albertus	*Marigold*
Albertus Extrabold	CG Omega
Antique Olive	*CG Omega Italic*
Antique Olive Italic	**CG Omega Bold**
Antique Olive Bold	*CG Omega Bold Italic*
Clarendon Condensed	CG Times
Coronet	*CG Times Italic*
Courier	**CG Times Bold**
Courier Italic	*CG Times Bold Italic*
Courier Bold	Univers Medium
Courier Bold Italic	*Univers Medium Italic*
Garamond Antiqua	**Univers Bold**
Garamond Kursiv	*Univers Bold Italic*
Garamond Halbfett	Univers Medium Condensed
Garamond Kursiv Halbfett	*Univers Medium Condensed Italic*
Letter Gothic	**Univers Bold Condensed**
Letter Gothic Italic	*Univers Bold Condensed Italic*
Letter Gothic Bold	Line Printer (16.67 pitch, 8.5 point only)

TrueType

Arial	Times New Roman
Arial Italic	*Times New Roman Italic*
Arial Bold	**Times New Roman Bold**
Arial Bold Italic	*Times New Roman Bold Italic*
Symbol αβχΔΕΦΓ	Wingdings

Internal Typefaces

Intellifont and TrueType

In your printer, the Intellifont and TrueType font scaling technologies both run under HP's PCL 5^e printer control language, giving you rapid font scaling inside the printer itself.

Intellifont

Intellifont is a font scaling technology developed by the AGFA Division of Miles, Inc. It is used in all scalable HP LaserJet printers and font products on the HP LaserJet III and beyond. Most software packages support them, including Word Perfect and Microsoft Windows applications.

TrueType

TrueType is a font scaling technology developed by Microsoft Corporation and Apple Computer, Inc. Your printer has 10 internal typefaces that match the TrueType typefaces that are included with Windows 3.1. This enhances Windows' printing performance and quality, because Windows applications do not have to download these typefaces to the printer.

Note You can access both the Intellifont and TrueType type scaling technologies through your Windows 3.1 and other applications.

Screen Fonts for Windows

To achieve true WYSIWYG ("what you see is what you get") capability for your Windows software, you must have screen fonts that match your printer fonts.

Screen fonts that match your printer's internal Intellifont typefaces are available free of charge from Hewlett-Packard. To order them, mail in the red order card located at the front of the *Getting Started Guide, Setting Up Your HP LaserJet 4Si Printer*. Be sure to specify whether you are using Windows 3.0 or 3.1 and the disk size your prefer.

4 Using Type

Elements of a Font

When you select a typeface through your word processing or other software, you may be prompted to select a point size or pitch. When you set up your page layout, you will also choose whether the text will be in portrait or landscape orientation. This combination of a typeface, a specific point size, and an orientation is called a "**font**."

Typeface

A "typeface" is the name for a specific design of characters and symbols. For example, "CG Times" is one typeface and "CG Times Bold Italic" is another typeface (see Figure 4-2). Both those typefaces belong to the CG Times typeface "family."

Figure 4-2

CG Times

CG Times Bold

CG Times Italic

CG Times Bold Italic
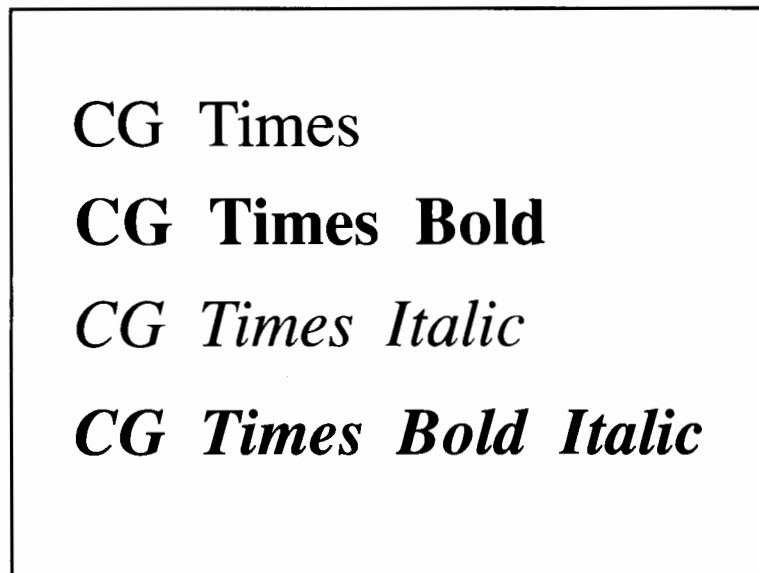
Four Typefaces from the CG Times Family

Note

When you make a word **bold** or *italic*, you are actually telling the software to select a different typeface.

Point Size

"Point size" refers to the height of your type measured in points ($\frac{1}{72}$ of an inch). All of your HP LaserJet printer's proportionally spaced internal typefaces are scalable from .25 point to a maximum of 999.75 points in quarter-point increments, depending on the capabilities of your software.

Figure 4-3 shows some commonly used point sizes:

Figure 4-3
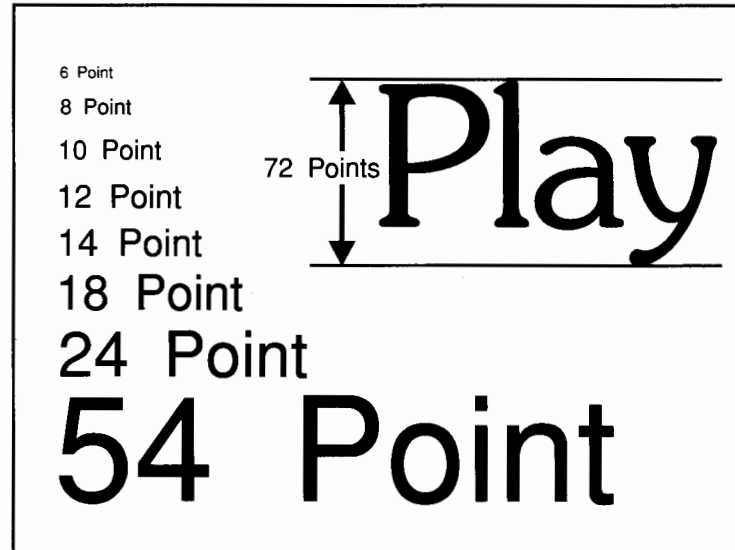
Examples of Various Point Sizes

Pitch

"Pitch" refers to the number of characters that can be printed in one horizontal inch (see Figure 4-4). For example, a font with a pitch of 10 will print 10 characters for every horizontal inch of text. Pitch only applies to typefaces with fixed spacing, such as Courier, Letter Gothic, or Line Printer.

Your printer will scale typefaces that have fixed spacing from .5 to 85.7 pitch (depending on the capabilities of your software).

Figure 4-4


```
This pitch is 10 characters/inch

This pitch is 12 characters/inch

This pitch is 16.67 characters/inch
```

Inches   1   2   3
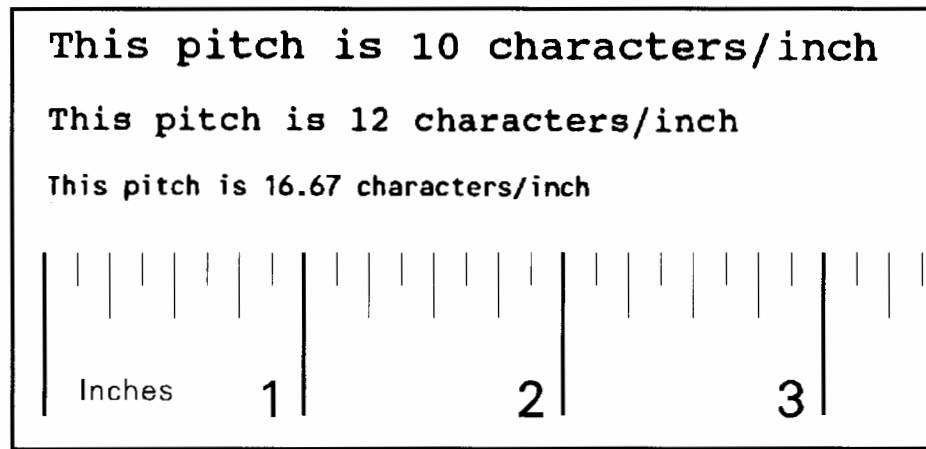
Pitch

Orientation

Portrait orientation is vertical–see Figure 4-5, item *(1)*. Landscape orientation is horizontal–see Figure 4-5, item *(2)*. When the printer receives a software or control panel command to print in landscape orientation, it will automatically rotate any internal and accessory font to print along the wide edge of your paper (landscape mode). This also applies to older HP bitmapped type cartridges that contain only portrait fonts.

Figure 4-5
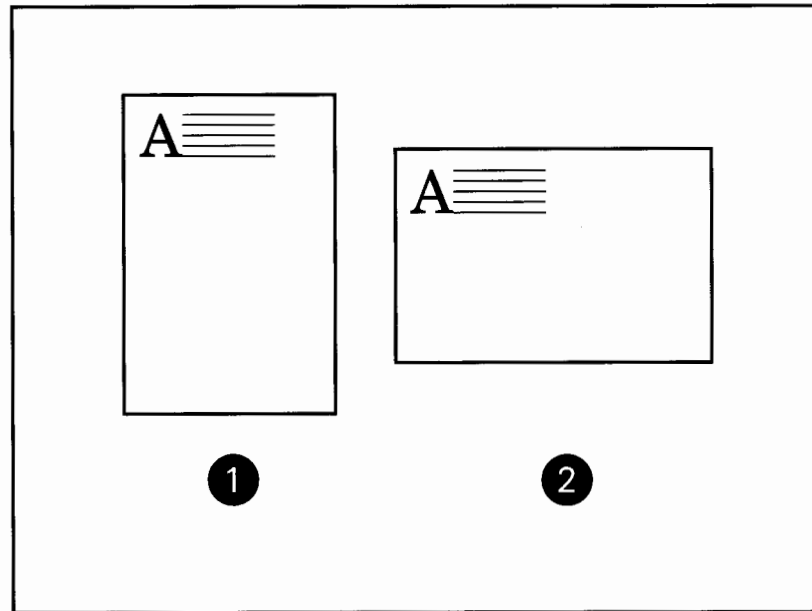
Portrait and Landscape Orientation

Symbol Set

A "symbol set" or "character set" (see Figure 4-6) is a collection of letters, numbers, and symbols designed for specific applications such as scientific equations, legal citations, and international languages.

Figure 4-6
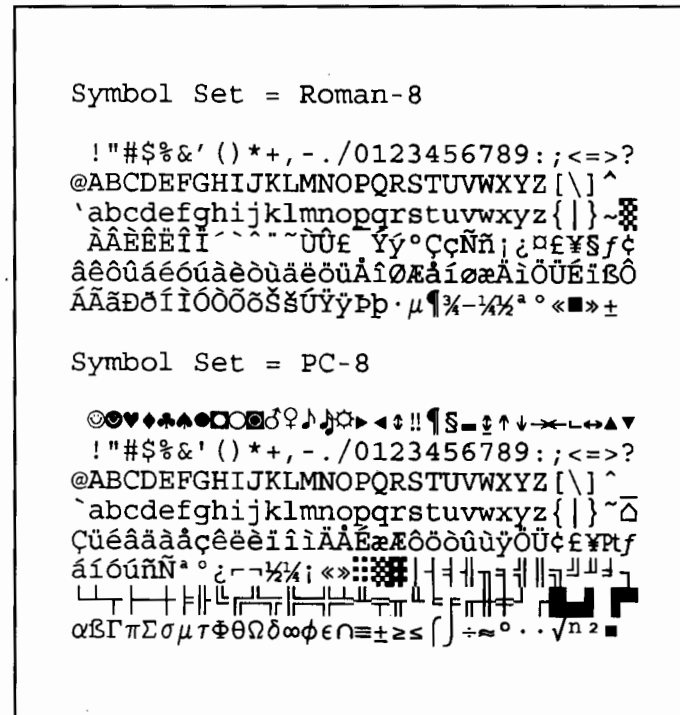
Roman-8 and PC-8 Symbol Sets

Selecting Symbol Sets in Your Software

If you want to print a symbol such as infinity (∞), you must first select the symbol set that contains that character. (For example, the ∞ sign is character # 236 in the PC-8 symbol set in Appendix B, "Symbol Sets.")

Note   Appendix B, "Symbol Sets," in this manual contains a complete listing of symbol sets supported by this printer. In most cases, it is better to use the symbol set charts shown in your software application's documentation, as they will be more representative of your application's abilities and features.

Symbol Set Availability

Two things you should know about symbol set availability are:

1 Your software may not support all of the printer's symbol sets. Refer to your software documentation for more information on what symbol sets, character sets, or code pages it supports.

2 Typefaces are designed to work with specific symbol sets. For example, the Arial typeface design does not include characters to support the Math-8 symbol set. See Figures B-1 and B-2 in Appendix B, "Symbol Sets," to see which symbol sets work with the typefaces you are using.

4 Using Type

Usually, you can specify a symbol set when you run your software's printer setup program.

Note The MC Text symbol set is not available through the control panel. You must select it either through your software or through a PCL printer command.

Entering Symbols into Text

Your software documentation will contain instructions for entering special symbols into your text. Look in the software documentation's index for phrases such as "compose feature," "composite characters," "symbol sets," "character sets," "code pages," or "extended characters."

Other Font Characteristics

A font has other characteristics such as stroke weight, style, and spacing (proportional or fixed-pitch). Your software will probably not ask you to enter codes for these font characteristics. However, if you are writing programs or using software that requires you to enter PCL codes to select fonts, you can find the PCL codes for selecting fonts:

- In Appendix A, "Printer Commands," of this manual.
- On the PCL Typeface List printout (see "The PCL Typeface List Printout" section later in this chapter for an explanation).
- In the *PCL 5 Printer Language Technical Reference Manual* .
- In any Hewlett-Packard type cartridge manual or typeface reference guide.

Using Printer Drivers

Printer drivers are program files that allow your software to use the printer's basic features, including the internal typefaces.

If your software lists the HP LaserJet 4Si or 4Si MX printer in its printer selection menu, the printer's internal typefaces are probably already available for your text. You do not need to run your software's printer setup program unless you want to prepare the software to use additional symbol sets, point sizes, etc. (If your software's driver for this printer does not support all of the printer's internal typefaces, contact your software manufacturer for instructions on obtaining additional driver support. Contact your authorized HP dealer for information about ordering drivers from HP.)

Note
Printer drivers for many common software applications are shipped with your printer.

Using Substitute Drivers

If your software application does not contain an HP LaserJet 4Si printer driver, you can select a substitute driver such as an HP LaserJet 4, IIISi, IIID, or LaserJet III printer driver. Although these drivers will allow you to use your HP LaserJet 4Si printer, they might not allow you to take advantage of your printer's new features such as 600 dpi resolution and tray locking.

Installing Printer Drivers

Some software lets you copy the printer driver into the directory that contains your software program. Other software applications require that you run a *printer setup* program or the software's *install* program in order to install a new printer driver. See the install "readme" file on the disk or your software documentation for instructions on setting up your software to use a new printer or new fonts. Look for phrases such as "installing fonts," "printer drivers," "printer installation," "updating printer files," and "adding printers" in your software manual's index.

Note

Your software determines which of the printer's internal typefaces you can use.

Adding Support for Accessory Fonts to a Printer Driver

Whether you are using typefaces on diskettes (also called "soft fonts") or in type cartridges, your software's printer driver needs to contain information about the size, shape, and style of the type characters so that it can format your text correctly.

Checking Your Current Driver

Many current software packages already contain drivers for most of Hewlett-Packard's scalable typefaces and bitmapped type cartridges.

If your fonts are listed in the software's menus, your software contains driver support for that font product. You can then follow the instructions that came with your fonts to either install a cartridge into the printer or install typeface files onto your hard disk.

Note
Just because your software lists your new typefaces in its menus doesn't necessarily mean the typefaces themselves are installed. You must still follow the instructions that came with your typefaces to either install the actual typeface files onto your hard disk or install a cartridge into the printer.

Updating a Driver (Intellifont)

There are several ways to add support for new Intellifont fonts and typefaces to a printer driver:

- Through the AutoFont Support utility that is included with all HP font products.
- Through the Type Director font management program.
- Through Intellifont-for-Windows.
- Through the Windows 3.0 or 3.1 *Control Panel* utility.

AutoFont Support (.TFM Files)

The AutoFont Support utility is included with all of HP's scalable typeface cartridges, typeface collections on disk (also called "soft fonts"), and bitmapped type cartridges (see Figure 4-7). (Some software manuals refer to AutoFont Support files as ".TFM files" or "Tagged Font Metrics.")

Figure 4-7
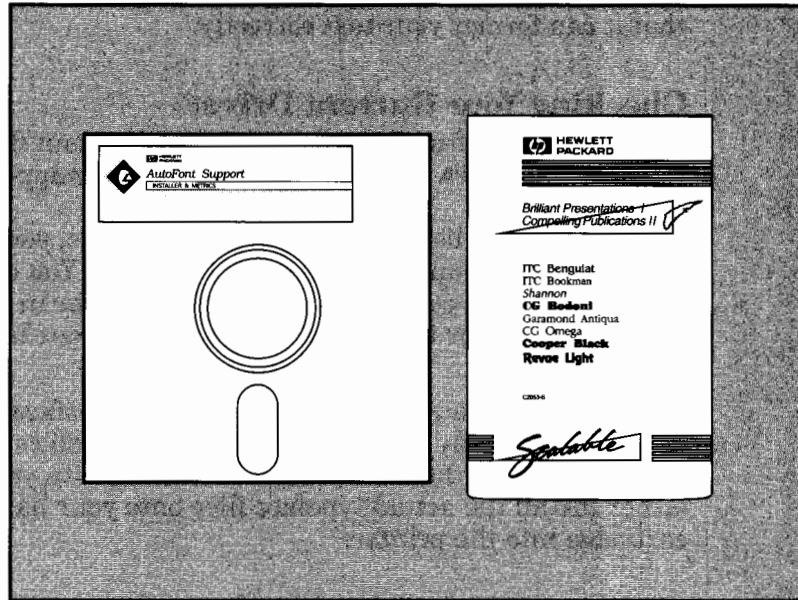
Type Cartridge with AutoFont Support Disks

The AutoFont Support utility allows some software applications to automatically add support for your new fonts and typefaces to their printer drivers. Software applications that use AutoFont Support to update their drivers include WordPerfect 5.1, Windows 3.0 and later, and WordStar 6.0 (version D).

Contact your software vendor to see if your software can use AutoFont Support (.TFM files) to update its printer driver. If it cannot, you have two options:

- You can request a printer driver for your new fonts from your software vendor. Some printer drivers for HP font products are also available from Hewlett-Packard. See your authorized HP dealer for ordering information.
- You can use the Type Director font management program to install and prepare your disk-based Intellifont typefaces for use with your software. See your authorized HP dealer for ordering information.

Intellifont-for-Windows

Intellifont-for-Windows is a program that installs Intellifont printer fonts and matching screen fonts into Windows (version 3.0 and later). This program is available at no charge from Hewlett-Packard. See your authorized HP dealer for ordering information.

Updating the Windows 3.1 Driver (TrueType)

See the *Microsoft Windows User's Guide* for instructions on using TrueType typefaces with Windows 3.1.

Installing Type Cartridges

To install a cartridge into the printer:

1 Press **On Line** to take the printer off line.
2 Insert the cartridge with the label on the *right*, as shown in Figure 4-8. Push it in until you hear a "click." Do not be afraid to push hard.
3 Press **On Line** to return the printer on line.

Figure 4-8
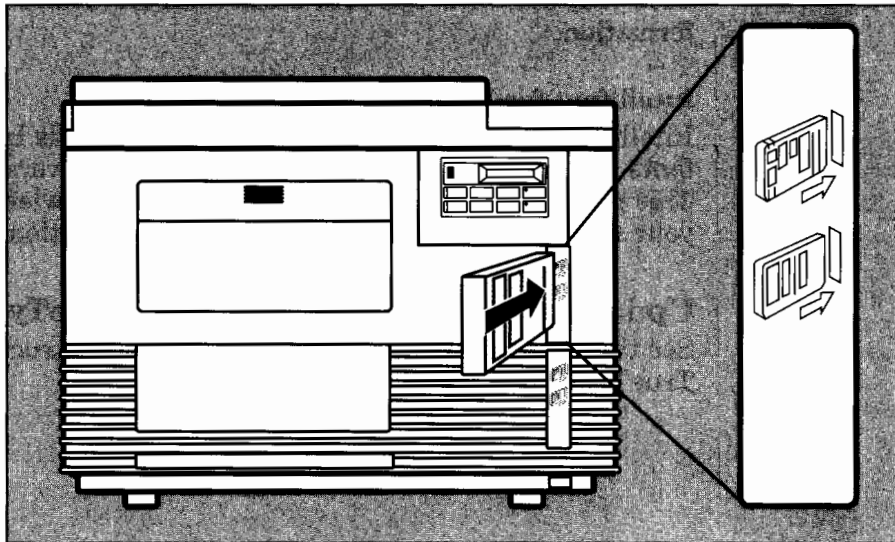
Inserting a Cartridge into the Printer

CAUTION
Do not insert or remove type cartridges while the printer is on line or while the Form Feed light is on. This disables the printer's ability to read and access the cartridge fonts and causes a printer message to appear. To recover, switch the printer OFF and back ON again. Any data in printer memory will be lost.

If your printer is connected to a network, be sure to check with your network administrator before installing or removing type cartridges.

Note

Your printer offers greatly improved print quality using 600 dpi resolution. To take best advantage of 600 dpi printing, use the 45 internal typefaces (or accessory scalable type) and new drivers designed for your printer.

If you are using older HP accessory cartridges, such as Pro Collection (HP part number 92286PC) or Microsoft Bitmapped Cartridge (HP part number 2053A #C01) or other bitmapped images which were designed for 300 dpi printing, you can use these accessories in either 300 dpi or 600 dpi mode. Although your printer will automatically print the information on these cartridges at 600 dpi, for best print quality, we recommend that you set your printer to 300 dpi resolution with RET=ON*.

Because your HP LaserJet 4Si printer is designed for 600 dpi printing, your 300 dpi documents will look almost as good as your 600 dpi documents.

Selecting Fonts through Software

For information about selecting fonts in your software, look in your software documentation for topics such as "font selection," "base font," "printer setup," "print options," "font appearance," "change font," or "select type."

4 Using Type

Selecting Fonts through the Control Panel

If your software does not allow you to select fonts through its menus, you can select fonts through the printer's control panel. When you select a font through the control panel, you must specify several items: the font source, the font number, the point size or pitch, and a symbol set.

Note   A software font request will override a font selected through the control panel.

To select a font through the control panel:

1 Press **On Line** to take the printer off line (the On Line light will go off).

2 Press **Menu** until TEST MENU appears on the display.
  a Press **Item** until PCL TYPE LIST appears.
  b Press **Enter** to print the typeface list. 06 TYPEFACE LIST will appear in the control panel display. It may take up to 30 seconds for printing to begin.

Note   The PCL Typeface List shows all the fonts available in the printer from all possible sources: internal typefaces, type cartridges, SIMM boards, and permanently downloaded soft fonts. Refer to it when using the control panel instead of software to select fonts. (For more information about the PCL Typeface List, see "The PCL Typeface List Printout" section later in this chapter.)

3 Press **Menu** until PCL MENU appears on the display.
  a Press **Item** until FONT SOURCE appears.
  b Press **+** to display one of the following selections:
    ■ I for internal font.
    ■ TOP for cartridge font in the top slot.
    ■ BTM for cartridge font in the bottom slot.
    ■ S for downloaded soft font.
    ■ M1, M2, M3, or M4 for a SIMM font.
  c Press **Enter** to save your selection (an asterisk (*) will appear).

4 Press ▓▓▓ until FONT NUMBER= appears. See the right column on the PCL Typeface List you just printed to find the font number.
  a Press ▓ to advance through the possible font numbers. (Holding ▓ will advance the numbers rapidly. If you accidentally bypass the number you want, use ▓▓▓ ▓ to go backwards.)
  b Press ▓▓▓ to save your selection (an asterisk (*) will appear).

Note   If you select a new symbol set through the control panel after selecting a font number, the font number will no longer be valid. Selecting a symbol set changes the order of the typefaces on the PCL Typeface List. Therefore, always print a new copy of the PCL Typeface List after changing the symbol set so that you can refer to it for the correct font number.

5 Press ▓▓▓ until PT. SIZE= or PITCH= appears. (PT. SIZE= appears when you are using a proportional typeface, such as CG Times. PITCH= appears when you select a fixed-pitch typeface, such as Courier or Letter Gothic. No type size option will appear if you select the Line Printer font.)
  a Press ▓ until your chosen point size appears.
  b Press ▓▓▓ to save your selection (an asterisk (*) will appear).

Note   This item does not appear when you select the font from a bitmapped type cartridge.

6 Press ▓▓▓ to return the printer on line.

Note   A software font selection command will always override the printer control panel setting.

4 Using Type

Default Font

The default font in the printer is 10 pitch Courier with the Roman-8 symbol set. The printer uses this font unless you:

1 Send a font selection command (using software or a printer command) to request a font in place of the default.

2 Insert a type cartridge or SIMM board with a default font marker.

3 Select a different default font through the control panel.

Using Fonts on a Network

If your printer is connected to a network, be sure to check with your network administrator:

- Before changing the default font through the control panel (if the network administrator has enabled control panel locking, you will be unable to make this change without help from the administrator).

- Before downloading or removing soft fonts and typefaces.

  This will conserve memory and help you avoid unexpected printer output.

Font Selection Priority

This is the order in which your printer selects its fonts:

1 First, the printer looks for a downloaded soft font.

2 If the requested font is not available as a disk-based font ("soft font"), the printer checks to see if the font is available in a type cartridge.

3 If the requested font is not available in a type cartridge, the printer checks for fonts on a SIMM.

4 If the font is not available on a SIMM, the printer selects one of its internal fonts.

When choosing a font, the font must be available from one of the above sources. If the font you request is not available, the printer selects the closest match based on individual font characteristics.

If both a scalable typeface and a bitmapped font are available from the same source, you will obtain best results by choosing your font in the following preference order:

5 For 600 dpi resolution:

   a 600 dpi bitmapped font
   b Scalable typeface
   c 300 dpi bitmapped font

6 For 300 dpi resolution:

   a 300 dpi bitmapped font
   b Scalable typeface

4 Using Type

The PCL Typeface List Printout

The PCL Typeface List printout lists the typefaces and bitmapped fonts currently available in your printer (both internal and accessory) for PCL print jobs. (See Chapter 5, "PostScript Printing," for instructions about printing a list of PostScript typefaces.)

To print a list of the printer's current fonts, refer to steps 1 and 2 on page 4-20.

CAUTION Generating the font printout deletes all *temporary soft fonts* (the fonts your software has downloaded for a specific document). Because of this, temporary soft fonts do not appear on the printout. *Permanent soft fonts*, which are listed, are downloaded soft fonts that stay resident in the printer until you download other fonts to replace them, or until you turn the printer off.

PCL Typeface List Explanation

Item	Explanation
1	Typeface is the name of the typeface.
2	Pitch/Point indicates the specified pitch or point size of the font. The escape sequence contains a shaded box followed by v or h. This indicates where you must enter the point size (for example, 14.25v) or the pitch (for example, 12.00h).
3	Escape Sequence (a PCL command) is used to select the designated font. Fill in *Pitch* or *Point* and *Symbol Set* in the boxes as required.
4	Font # is the number you use to select internal, cartridge, or downloaded soft fonts from the control panel. (Do not confuse font *number* with the soft font *ID,* described next.) The letter preceding the font number shows the source of the font (I is *Internal,* C is *Cartridge,* S is *Permanent Soft Font,* and M is SIMM [slot number follows]).
5	Font ID is the number you assign to soft fonts when you download them through your software.

Figure 4-9

PCL Typeface List Printout

Special Fonts and Services

Hewlett-Packard provides materials and services for special fonts
and related items.

Designing Your Own Soft Fonts and Macros

You can design your own soft font or macro files (for printing
forms, logos, etc.) to use with the HP LaserJet printer. Complete
instructions are in the *PCL 5 Printer Language Technical Refer-
ence Manual*. See your authorized HP dealer for ordering
information.

Special Application Fonts Available from HP

Hewlett-Packard designs some fonts for special applications such as
printing bar codes, preparing presentation slides, or producing spe-
cial symbols for legal or scientific documents. Contact your local
authorized HP dealer.

Hewlett-Packard Custom Font Services

Hewlett-Packard custom type cartridges and soft fonts are now
available. You can design your own custom type cartridge or soft
font package to fit your particular needs:

- Any font or typeface from any standard HP collection.
- Arabic, Hebrew and Cyrillic typefaces.
- Bar codes, including 3 of 9, Codeabar, UPC, and others.
- Custom symbol set mappings.
- Signatures and logos.
- Macros for automatically printing standard forms with your data.

  For information on these services, contact your authorized HP
  dealer.

PostScript
Printing

Introduction

POSTSCRIPT

This chapter contains information about:

- PostScript Language Setup
  - Installation
  - PostScript Printer Drivers
  - PostScript Interpreter Memory Recommendations
- Control Panel
  - Selecting Menu Items
  - Control Panel Differences
- PostScript Menus
  - Printing Menu
  - PostScript Language Menu
  - Job Menu (Page Protection, Resolution, Personality, Timeout)
  - Config Menu (Clearable Warnings, Auto Continue)
  - Memory Configuration Menu (resource saving)
  - Parallel Menu
  - Test Menu (PS CONFIG PAGE, PS TYPE LIST, PS DEMO PAGE)
- PostScript Typefaces
- Cancelling a Print Job
- Troubleshooting the PostScript Language
- Related Documentation
- PostScript Interpreter Limited Warranty

PostScript Language Setup

When you install the PostScript software SIMM option (see Appendix F, "SIMM Board Installation"), or if the PostScript language already is installed, a PS MENU selection automatically is added to the sequence of control panel menus. The Test Menu and Memory Configuration Menu will display additional options and may function differently from that described in Chapter 2, "Printer Control Panel." All other printer functions operate as described in other chapters of this manual.

Macintosh Note Your PostScript language SIMM contains genuine PostScript Level 2 from Adobe, which is backward-compatible with Level 1 PostScript.

Remember these terms when reading through this manual:

- *Control panel* refers to the printer's control panel, not the Control Panel utility on your Macintosh.
- *Menu* refers to a list of selectable items on your printer's control panel, not a menu you choose on your Macintosh screen.

PostScript Printer Drivers

To use software applications which support PostScript, you must select a PostScript language printer driver from within your application. For best results, select the driver in the following order:

1 HP LaserJet 4Si/4Si MX

2 HP LaserJet IIISi

3 HP LaserJet 4

4 Apple LaserWriter II NT/NTX

5 Generic PostScript

If your software does not offer a PostScript language printer driver selection, it may not support PostScript printing. For more information, see your software documentation or contact your software vendor.

Note

A file printed using the PostScript language can print differently than in other printer languages because the characters and spacing in your Adobe fonts can differ. PostScript software drivers also are different.

Each software application has its own method for installing PostScript drivers. For instructions about printer driver installation and selection, see your software documentation or check to see if the disk contains installation instructions on a "readme" file. Otherwise, contact your software vendor for installation instructions.

PostScript Interpreter Memory Recommendations

Table 2-1 on page 2-8 shows the total memory requirements for different page configurations (the HP LaserJet 4Si printer comes with 2 MBytes of internal memory).

If you have the LaserJet 4Si MX printer, the PostScript option and 8 MBytes of additional memory are already installed on your printer.

Table 5-1 gives the size of the area that prints.

Table 5-1

PostScript Image Areas at 600 dpi

Page Size	Image Area	
Letter[1]	8.16 x 10.67 inch	20.7 cm x 27.1 cm
Legal	8.16 x 10.67 inch	20.7 cm x 34.7 cm
Mini-Legal	7.41 x 12.17 inch	18.8 cm x 30.9 cm
A4	7.89 x 11.36 inch	20.0 cm x 28.9 cm
Exec	6.88 x 10.17 inch	17.5 cm x 25.8 cm
Com10	3.79 x 9.17 inch	9.6 cm x 23.3 cm
DL	3.95 x 8.33 inch	10.0 cm x 21.2 cm
Monarch	3.52 x 7.17 inch	8.9 cm x 18.2 cm

1 At 300 dpi, the width of the image area will be slightly narrower.

5 PostScript Printing

Control Panel

When you install the PostScript option, or if the PostScript language already is installed on your printer, a PostScript language menu is added to the control panel system of menus following the PCL Menu (see Table 5-2).

Most menu items work for all installed personalities. Only the menus and menu items that specifically apply to the PostScript language are described in the following sections. For information about items not described below, see Chapter 2, "Printer Control Panel."

Table 5-2

Control Panel Basic Menu Structure

PRINTING MENU →	PCL MENU →	PS MENU	JOB MENU →	CONFIG MENU →	MEM CONFIG MENU[2] →	PARALLEL MENU →	TEST MENU →
COPIES ↓	FONT SOURCE ↓	PRT PS ERRS ↓	PAGE PROTECT ↓	LOCK ↓	RESORCE SAV ↓	HIGH SPEED ↓	SELF TEST ↓
OUT BIN ↓	FONT NUMBER ↓	JAM RECOVER ↑	RESOLUTION ↓	CLR WARN ↓	PCL MEM PS MEM ↑	ADV FNCTNS ↑	CONT SELF TEST ↓
PAPER (ENVELOPE) ↓	PITCH (PT SIZE)[1] ↓		PERSONALITY ↓	AUTO CONT ↓			PCL TYPE LIST ↓
ORIENTATION ↓	SYM SET ↑		TIMEOUT ↑	LOW TONER ↓			PCL DEMO PAGE ↓
FORM ↓							PS CONFIG PAGE ↓
MANUAL FEED ↓							PS TYPEFACE LIST ↓
JOB OFFSET ↓							PS DEMO PAGE ↑
RET ↑							
These menu items can be changed by software.				These menu items cannot be changed by software.			

1 The selection PT. SIZE appears only if appropriate.
2 This menu appears only if enough memory is installed to support Resource Saving. See Table 2-1 on page 2-8.

Selecting Menu Items

To select a menu item:

1 Press ▓▓▓▓▓ to take the printer off line.
2 Press ▓▓▓▓ repeatedly until you reach the desired menu (Printing Menu, for example).
3 Press ▓▓▓▓ to cycle through the menu selections.
4 When you reach the desired item (copies, for example), press ▓ to cycle through the selections (if you hold down ▓▓, you can scroll through selections at a faster pace).
5 Press ▓▓▓▓ to save the selection as the default (an asterisk (*) appears next to the item).
6 Press ▓▓▓▓ to return the printer on line.

Note	If you change a control panel selection (other than PS MENU selections), it is changed for other languages, such as PCL, as well as for PostScript.

Control Panel Differences

For PostScript, the indicator lights and control panel keys function the same as in PCL mode, as described in Chapter 2, "Printer Control Panel," except that ▓▓▓▓▓ is inoperative and ▓▓▓▓ has a different effect (see below). For other differences in control panel and printer operation, see the information under the specific control panel menu heading below.

Table 5-3

Key	Function
▓▓▓▓▓▓	The Form Feed indicator lights when data is processed, but the ▓▓▓▓▓▓ key cannot be used to eject a page.
▓▓▓▓	In PostScript mode, ▓▓▓▓ (▓▓▓▓ + ▓▓▓▓) removes all downloaded data, including typefaces and forms unless Resource Saving is activated. Use ▓▓▓▓ to reinitialize PostScript.

5
PostScript
Printing

PostScript Language Menus

Most menus and menu items are similar to those for PCL. Those that are different for the PostScript language are given below. For other menu items and for greater detail, see Chapter 2, "Printer Control Panel."

Printing Menu

Printing Menu items are the same as for the PCL language. See Chapter 2, "Printer Control Panel."

PostScript Menu

The PostScript menu contains only two items: PRT PS ERRS and JAM RECOVER.

PRT PS ERRS

If you select PRT PS ERRS=ON*, the printer prints a page describing any errors that the PostScript interpreter encounters. No PostScript error messages will be displayed on the control panel. This page is useful for someone developing a PostScript language technical application, or for troubleshooting problems (see the "Troubleshooting the PostScript Language" section at the end of this chapter). For other, non-PostScript interpreter printer messages, see "Auto Continue" under the Config Menu later in this chapter.

We recommend that you leave the default PRT PS ERRS=OFF*.

JAM RECOVER

JAM RECOVER enables you to select whether PostScript will automatically reprint the image of a jammed page once the problem has been cleared. The default is JAM RECOVER=OFF*. Setting JAM RECOVER=ON* will impact printer performance.

Job Menu

The Job Menu items page protection, resolution, and personality can affect PostScript operation differently than for PCL.

Resolution

Your PostScript printer driver may not select 600 dpi (dots-per-inch) resolution. If this is the case, you still can select 600 dpi resolution from the printer's control panel. The printer's default resolution setting is 600 dpi.

Personality

Through the Job Menu's PERSONALTY item, you can set the printer's "personality," or operating language, to either AUTO (automatic language switching) or the language of your choice (such as PostScript, PCL). If you select the PostScript language as the default (PERSONALTY=PS), then the printer cannot automatically switch between the PostScript and PCL languages (unless your software driver supports this switching).

Note We recommend that you use the default, PERSONALTY=AUTO*, especially if you share your printer with other users.

Timeout

Timeout specifies the maximum time the printer waits for data before switching to another source. The PostScript "jobtimeout" and "waittimeout" commands are not affected by this menu item. Timeout does not affect how long a PostScript job runs or how long PostScript waits for input.

Config Menu

The Configuration Menu contains the following items which affect PostScript operation differently than PCL.

Clearable Warnings

If you consistently receive clearable warning messages, you may need more memory. See Chapter 2, "Printer Control Panel," and Chapter 7, "Troubleshooting," for more information.

Auto Continue

Auto Continue refers to the way printer messages are handled:

- When you select AUTO CONT=ON, the printer resumes printing after non-critical printer messages appear on the display. These messages are displayed for only about 10 seconds, then 00 READY appears and the printer resumes printing. PostScript language errors do not appear on the control panel display.
- When you select AUTO CONT=OFF, a printer message remains in the display until you tell the printer to continue.

Note

If your printer is part of a network, remote system, spooling system, or is configured for PostScript, leave the default setting AUTO CONT=ON*.

If you need to diagnose PostScript printer problems, operate the printer with AUTO CONT=OFF and PRT PS ERRS=ON. Pressing **Continue** enables you to print error message pages, and to display the PostScript error message number.

Memory Configuration Menu

The Resource Saving feature in the Memory Configuration menu enables you to save your PostScript printing environment and configuration when switching between PostScript and PCL personalities.

Refer to the discussions of Resource Saving and the Memory Configuration Menu on pages 2-12 and 2-37.

Parallel Menu

The Parallel Menu contains the following item that affects PostScript language operation differently than PCL.

Advanced Functions

ADV FNCTNS=ON enables you to use printer configuration software programs that read data from the printer's parallel port. Setting ADV FNCTNS=OFF can increase personality switching speed, but it will impact the overall printer performance.

Test Menu

Three PostScript items are added to the printer's Test Menu when you install the PostScript option:

- PS CONFIG PAGE
- PS TYPEFACE LIST
- PS DEMO PAGE

Note Since these pages take more than 2 MBytes of memory to print at 600 dpi resolution, you may receive a clearable warning message. To clear the clearable warning, press **Continue**

PostScript Configuration Page

The PostScript configuration page (the PS CONFIG PAGE item in the Test Menu) is shown in Figure 5-1. To print this page:

1 Press On Line to take the printer off line (the On Line light goes off).
2 Press Menu (or Shift Menu) until TEST MENU appears in the display.
3 Press Item to cycle to PS CONFIG PAGE.
4 Press Enter to print the PS CONFIG PAGE. The page prints in less than one minute.
5 Press On Line to return the printer on line.

Note

Before printing a PostScript configuration page, make certain the Ready or On Line indicator is not flashing. This indicates the printer is receiving data or printing another job.

PostScript Configuration Page Printout Items

Item   Explanation

1   Settings: Contains current printer control panel default settings that affect PostScript, as well as product-specific information such as Printer Name and PostScript version. PostScript-specific settings include:

         • Wait Timeout: The PostScript timeout, not the timeout value set from the control panel's Job Menu.

         • Printer Name: Name set by user (a network name, for instance).

         • Print Errors: Value set through the printer control panel's PS Menu.

         • PostScript Version: The version of PostScript installed.

         • System Password/Job Password: To protect your passwords, these values are either "0" (the default) or "Not Default" (indicating that a password is present).

2   Printable Area: Gives the dimensions within the margins of the image area. Printable area is dependent upon the amount of memory installed. Note that for legal-sized paper, page protection must be set to LGL or the printable area that appears here is reduced. The current default is shown within the hollow box.

3   Memory: The information given shows how PostScript uses printer memory. It can be useful for more experienced PostScript users since PostScript Level 2 enables users to configure memory parameters (see the PostScript Level 2 "Redbook" for specific information about these values).

4   Page Count: Shows how many pages have been printed by the printer. You can use the page count to track printer use. The page count is always updated.

Figure 5-1

PostScript™ Configuration Page

Settings

Printer Name: LaserJet 4Si
Product Name: LaserJet 4Si
System Password: 0
Job Password: 0
Postscript Version: 2011.110
Postscript Revision: 1
Copies: 2
Orientation: Portrait
Resolution: 600 dpi
Wait Timeout: 40 seconds
Resolution On
Enhancement: Off
Print Errors: On
Jam Recovery: On
Duplex: Long Edge
Binding: Letter
Upper Cassette: Letter
Lower Cassette: Off

Printable Area

	Width (inches)	Height (inches)
Letter	8.16	10.67
Legal	7.41	12.17
A4	7.89	11.36
Exec	6.88	10.17
Com10	3.79	9.17
DL	3.95	8.33
Monarch	3.52	7.17

Memory

Global VM (Max): 6273724 bytes
Local VM (Max): 5495680 bytes
Display List (Max): 1048576 bytes
Font Cache (Max): 350000 bytes
Font Cache (Current): 96780 bytes
Form Cache (Max): 100000 bytes
Pattern Cache (Max): 100000 bytes
Screen Storage (Max): 120000 bytes

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Page Count

PostScript Configuration Page

PostScript Typeface List

The PostScript Typeface List (PS TYPEFACE LIST in the control panel's Test Menu) has samples of the 35 built-in PostScript language typefaces (see Figure 5-2). Due to the complexity of the PostScript Typeface List, it may take up to 30 seconds before printing begins.

To print a PostScript Typeface List:

1 Press **On Line** to take the printer off line. The on line light goes off.

2 Press **Menu** repeatedly until TEST MENU appears in the display.

3 Press **Item** to cycle to PS TYPEFACE LIST.

4 Press **Enter** to print PS TYPEFACE LIST.

5 Press **On Line** to return the printer on line.

The PostScript Typeface List displays *only* the 35 PostScript language typefaces, with print samples for each typeface. The list can *not* display the printer's internal or downloaded PCL typefaces or any PostScript language downloaded typefaces.

The characters shown on the PostScript Typeface List are printed in only one size. You can scale these characters to any size.

Figure 5-2

PostScript Typeface List
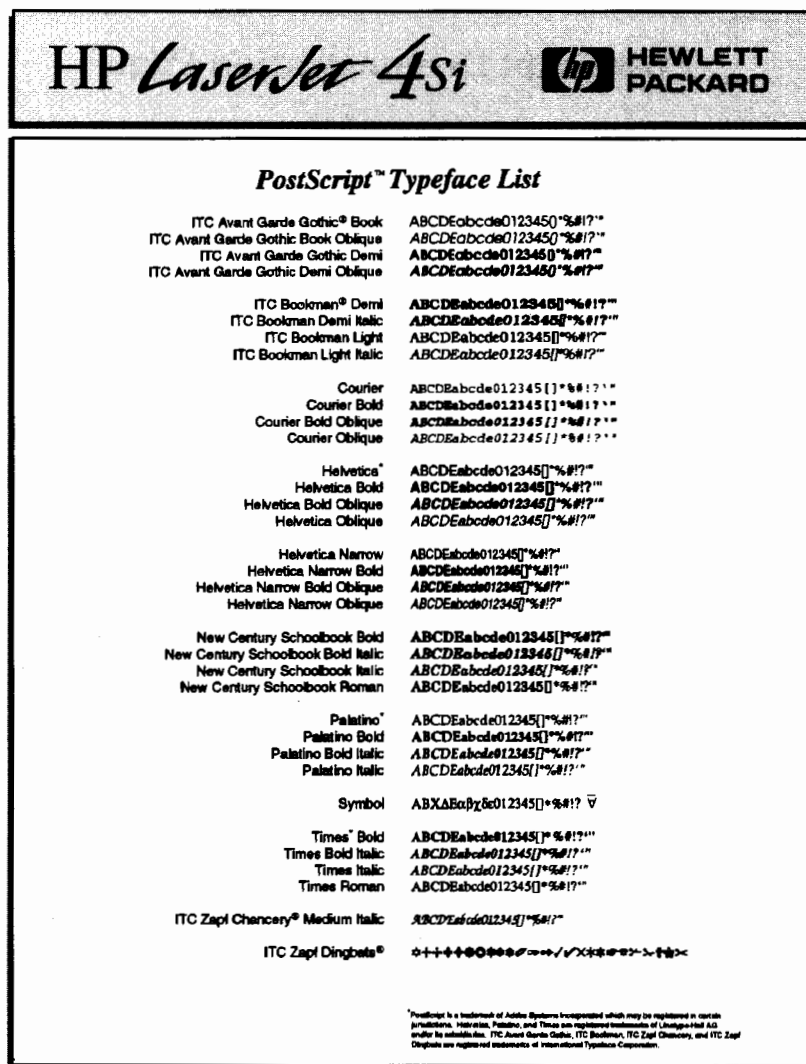
PostScript Demonstration Page

The PostScript language demonstration page (see Figure 5-3) is designed to illustrate your printer's features and print quality when using the PostScript printer language.

To print a PostScript language demonstration page:

1 Press **On Line** to take the printer off line. The on line light goes off.

2 Press **Menu** until TEST MENU appears in the display.

3 Press **Item** to cycle to PS DEMO PAGE.

4 Press **Enter** to print the PS DEMO PAGE.

5 Press **On Line** to return the printer on line.

Note   Before printing a PostScript language demonstration page, be sure the Ready light is not flashing. This indicates the printer is receiving data or printing another job. When PS DEMO PAGE is selected, the active job is terminated.

Figure 5-3

PostScript Demonstration Page

PostScript Typefaces

The PostScript language contains 35 scalable typefaces drawn from 11 typeface families, all licensed from Adobe Systems, Inc. Over 650 additional typefaces compatible with your printer are available from the Adobe Type Library. These typefaces can be purchased and used in your printer if the PostScript option has been installed.

Since PostScript typefaces require software support, check your software documentation for information about using PostScript typefaces. If you are writing your own PostScript application, see "Related Documentation" on page 5-23.

You *cannot* use your PostScript typefaces in combination with the PCL typefaces resident in your printer, or with other typefaces supported by PCL. Language switching enables you to use either the PostScript or PCL-supported type, but not both simultaneously.

Note   The printer cannot read PostScript-based cartridges such as the C2089A cartridge or Adobe cartridge products for HP LaserJet printers.

Canceling a Print Job

To cancel a print job, you must perform a 07 RESET. Once a PostScript job is accepted by the printer, this cancels the print job and returns the printer to known settings. See Chapter 2, "Printer Control Panel," for more information about the reset function.

To perform a reset, take the printer off-line and press and hold **Shift** while pressing **Reset** . 07 RESET appears in the control panel display. If the printer still is receiving data, you may need to press **Reset** several times.

Note

Note that a reset purges user-downloaded PostScript typefaces from the printer's memory unless Resource Saving has been activated.

Troubleshooting PostScript Printing

For general printer troubleshooting, see Chapter 7, "Trouble-shooting." The following items in Table 5-4 are PostScript-language-specific and can occur in multiple printer language and shared printer environments.

Table 5-4

PostScript Troubleshooting

Condition	Recommended Action
A text listing of PostScript commands prints instead of your PostScript printing job.	The control panel PERSONALTY=AUTO setting was confused by a nonstandard PostScript encapsulation. Set the control panel PERSONALTY setting to PERSONALTY=PS for this print job only, then, when the job has printed, return the setting to AUTO.
The job prints in a typeface other than the one you requested.	The requested typeface is not downloaded; download the desired font.
Letter page jobs fail to print	First, set PRT PS ERRS=ON, then send the job again to print a PostScript Error Page. If an error page prints, see the error page box below ("A PostScript error page prints"). If no error page is produced and the job does not print, see if page protection is set to PAGEPROTECT=OFF. If this does not correct the problem, you may need to install more memory (see "PostScript Interpreter Memory Recommendations" earlier in this chapter).
A PostScript error page prints.	Make sure the print job is a PostScript job. Check to see if your software expected you to send a setup or PostScript header file to the printer.
Your computer displays: Writing to LPTn: Abort, Retry, Ignore?: or Writing to COMn: Abort, Retry, Ignore?	Try setting infinite timeouts on your computer. See your MS-DOS manual for information about the Mode command.

Related Documentation

If you wish to learn more about the PostScript language, the following books are available at book stores or publishing houses:

PostScript Language Reference Manual. Second Edition. Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc., December 1991.

PostScript Language Supplement for Version 2011. Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc., 1991.

PostScript Language Program Design. Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc., 1988.

PostScript Language Tutorial and Cookbook. Adobe Systems Incorporated. Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.

The following documents are available from Hewlett-Packard. Contact your authorized HP dealer for ordering information.

Adobe Printer Developer Guide PostScript Language Printer Addendum for HP LaserJet 4Si Printer with PostScript version 2011, 1992.

PostScript SIMM Technical Reference, HP part number C2080-90921.

5 PostScript Printing

Limited Warranty

Hewlett-Packard warrants the PostScript SIMM module (HP part number C2013A) against defects in materials and workmanship for one (1) year from the date of purchase. If HP receives notice of such defects during the warranty period, HP will replace PostScript SIMM modules which prove to be defective. If HP cannot replace a module within a reasonable time, you will receive a refund of the purchase price.

Exclusions

The above warranty shall not apply to defects resulting from accident or misuse, unauthorized service or modification, or operation outside of the environmental specifications of your printer.

Warranty Limitations

HP makes no other warranty, whether written or oral, expressed or implied, with respect to this PostScript SIMM module. HP specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Some states or provinces do not allow limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. However, any implied warranty of merchantability or fitness is limited to the one year duration of this written warranty.

PostScript SIMM Module Replacement

If the PostScript SIMM module fails within the one year warranty period, return the module to the place of purchase for replacement. Be sure to include a copy of your purchase receipt with the returned PostScript SIMM module. If you are unable to return the module to its original place of purchase, you can obtain a replacement module by providing any authorized HP Dealer or HP Sales Office with the defective module and its purchase receipt.

6

**User Maintenance
and Adjustments**

Introduction

The HP LaserJet 4Si printer requires minimum routine Key Operator maintenance. Use this chapter to find information about:

- Extending the life of the toner cartridge.
- Adjusting the print density.
- Cleaning the:
  - Paper pickup area.
  - Paper feed guide.
  - Antistatic teeth.

User maintenance includes replacing the printer's fuser assembly. When your printer has printed 200,000 pages, the USER MAINTENANCE message is displayed in place of the 00 READY message. At that time, the fuser assembly must be replaced to keep your HP LaserJet 4Si printer at optimal performance.

Instructions for replacing the assembly can be found in the *HP LaserJet 4Si Printer Operator's Guide,* and in the instruction guide included with the replacement kit. When the maintenance is completed, clear the message (set USER MAINT=OFF* in the Config Menu) and continue printing.

Contact your dealer or refer to the information on the inside cover to order the replacement kit.

- 110V – HP product # C2062A
- 220V – HP product # C2087A

The Toner Cartridge

The toner cartridge in your printer contains the printing mechanism and a supply of toner. *The toner cartridge life depends on the amount of toner your jobs require.* When you print word-processed text, a toner cartridge lasts approximately 8,000 pages, printed at 5% coverage. (A typical business letter, as shown in Figure 6-1, is about 5% coverage.) This approximation is based on the print density setting at the middle range (see Figure 6-3 on page 6-8).

Figure 6-1
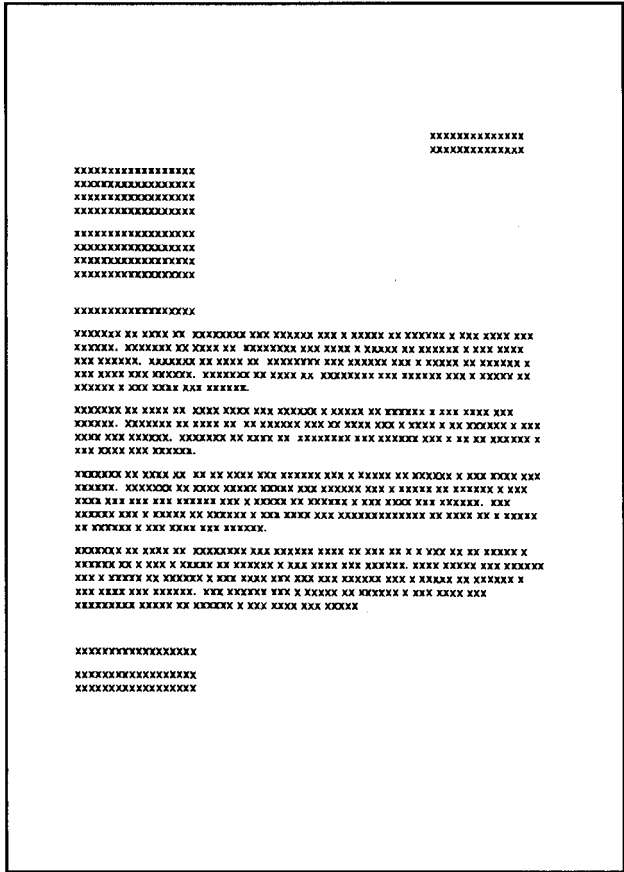
5 Percent Toner Coverage

Storing the Toner Cartridge

Do not remove the toner cartridge from its packaging until you are ready to use it. The cartridge may be stored for up to 2 years *unopened* (or 6 months if *opened*) and still retain the full 8,000-page life expectancy. Use the cartridge before the expiration date (the expiration date is stamped on your toner cartridge box).

Always store cartridges:

- Away from direct sunlight or other strong light.
- As specified on the shipping box or horizontally (flat) if removed from the box.
- In a normal office environment—for example, a location with regulated temperature and humidity (see Appendix C, "Environmental Specifications").

Refilled Toner Cartridges

While Hewlett-Packard does not prohibit the use of refilled toner cartridges during the warranty period or under a maintenance contract, we also do not recommend their use. The reasons for this are:

- The refilled toner cartridges are not Hewlett-Packard products, and therefore Hewlett-Packard has no control or process to ensure that the refilled toner cartridge can function at the high level of reliability of a new HP LaserJet toner cartridge. Hewlett-Packard also cannot predict what the long term reliability effect on the printer is from using different toner formulations found in refilled cartridges. Because HP LaserJet printers have the highest reliability reputation in the industry, we are concerned about any usage that might affect this reputation.
- Hewlett-Packard has no control over the actual print quality of a refilled toner cartridge. The print quality of HP LaserJet cartridges directly influences the customer's perception of the printer itself. The high print quality of HP LaserJet printers is one of the primary reasons for the success of the product and we are keenly interested in maintaining that image.

TONER LOW Message

If the 16 TONER LOW X (where X is a 1, 2, or 3) message appears in the display, the toner level in the toner cartridge is getting low. The print becomes lighter and white streaks may soon begin to appear. The TONER LOW message progresses from 1 to 2 and finally to 3.

The LOW TONER item in the Config Menu determines whether the printer continues printing when 16 TONER LOW messages appear. If LOW TONER=STOP* is selected, printing stops at each message level until an operator intervenes and changes toner or presses the **Continue** key. If LOW TONER=CONT*, the 16 TONER LOW messages still appear, but the printing continues. In either case, these messages remain active in the display until the toner is redistributed or the cartridge is changed.

- 16 TONER LOW 1—You should be able to print approximately 200 additional pages before the 16 TONER LOW 2 message appears.

- 16 TONER LOW 2—Print quality begins to degrade noticeably. Approximately 200 additional pages print before the 16 TONER LOW 3 message appears.

- 16 TONER LOW 3—Any additional pages are likely to be illegible. Change the toner cartridge.

You can *temporarily* improve the print quality by redistributing the toner as follows:

1 Open the printer's top cover.

2 Remove the toner cartridge.

3 Shake the toner cartridge as shown in Figure 6-2 to redistribute toner.

4 Reinsert the toner cartridge.

5 Close the printer cover.

The 16 TONER LOW X warning still can appear, but the print quality should improve temporarily. If the print remains light, you must replace the toner cartridge immediately. Install the new cartridge as described in the instructions included with the cartridge. (You also can find these instructions in the *Operator's Guide* that came with your printer.)

Figure 6-2
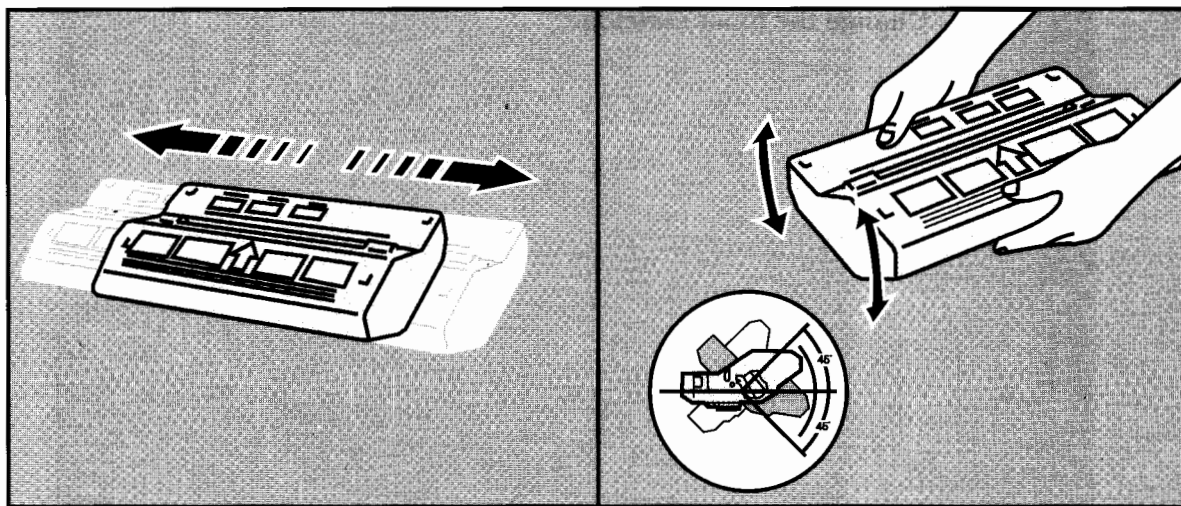
Shaking the Toner Cartridge

Adjusting Print Density

Print density refers to the relative darkness of the print on the paper. Very dense print appears dark. Less dense print looks lighter, and solid filled areas can be less uniformly black.

When the density slide is set toward the rear of the printer (the thick end of the wedge-shaped scale), toner is used at a faster rate, reducing toner cartridge life. To adjust print density:

1 Open the printer's top cover.

2 Locate the print density control inside the printer near the left side of the fuser (see Figure 6-3). As the control is moved through the medium setting, a discernible "click" can be felt. To set the print density control for:

- **Medium:** Set control at midpoint (the standard setting).
- **Dark:** Set control toward the rear of the printer.
- **Light:** Set control toward the front of the printer.

3 Firmly close the printer's top cover.

The print quality will stabilize after approximately 20 pages have been printed.

Figure 6-3
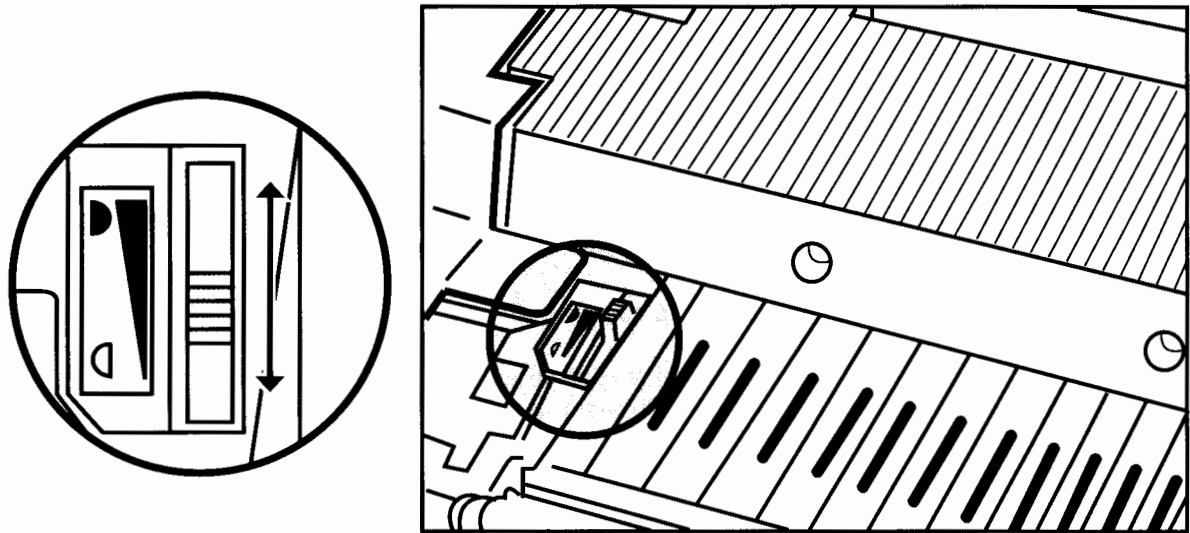
Adjusting Print Density

Print Density and Resolution Enhancement

The print density adjustment setting interacts with **Resolution Enhancement**. For Resolution Enhancement, adjusting the print density can place too much or too little toner at the transition points along gradually sloping lines. Refer to "Resolution Enhancement" in Chapter 2, "Printer Control Panel" for information about maintaining optimum print quality.

Cleaning the Printer

The HP LaserJet 4Si printer was designed for easy maintenance. Diagrams of printer cleaning locations and detailed instructions are provided in the rest of this chapter. To maintain print quality, thoroughly clean your printer:

- Every time you change the toner cartridge.
- After printing 8,000 single-sided pages (or 4,000 duplex).
- Whenever print quality problems occur.

Many print quality problems can be avoided by simply cleaning your printer.

To clean the printer, follow the steps listed below. Pay particular attention to the warnings and cautions that follow the steps.

1 Turn OFF the printer and unplug the power cord.

2 Open the printer's top cover (see Figure 6-4).

3 Clean the inside of the printer, **except for the transfer roller**, by wiping away any visible toner with a water-dampened, lint-free cloth.

4 Clean the remaining areas as described on pages 6-12 through 6-14. Figure 6-4 shows the interior of the printer, including locations which require cleaning.

WARNING   Failure to turn off the printer before you clean the interior can result in severe personal injury.

CAUTION   Do not touch or clean the transfer roller when cleaning the printer. Finger oils or other contaminants can cause reduced print quality.

Do not use ammonia-based cleaning materials on the printer covers or in the vicinity of the printer. Ammonia causes permanent damage to the toner cartridge. Any cleaning fluid, except water, used in and around the printer may cause damage to the printer.

Note   If toner gets on your clothes, wipe it off with a dry cloth and wash the clothes in *cold* water. Hot water sets toner into fabric. Although toner is nontoxic, take care to avoid breathing toner particles.

Figure 6-4
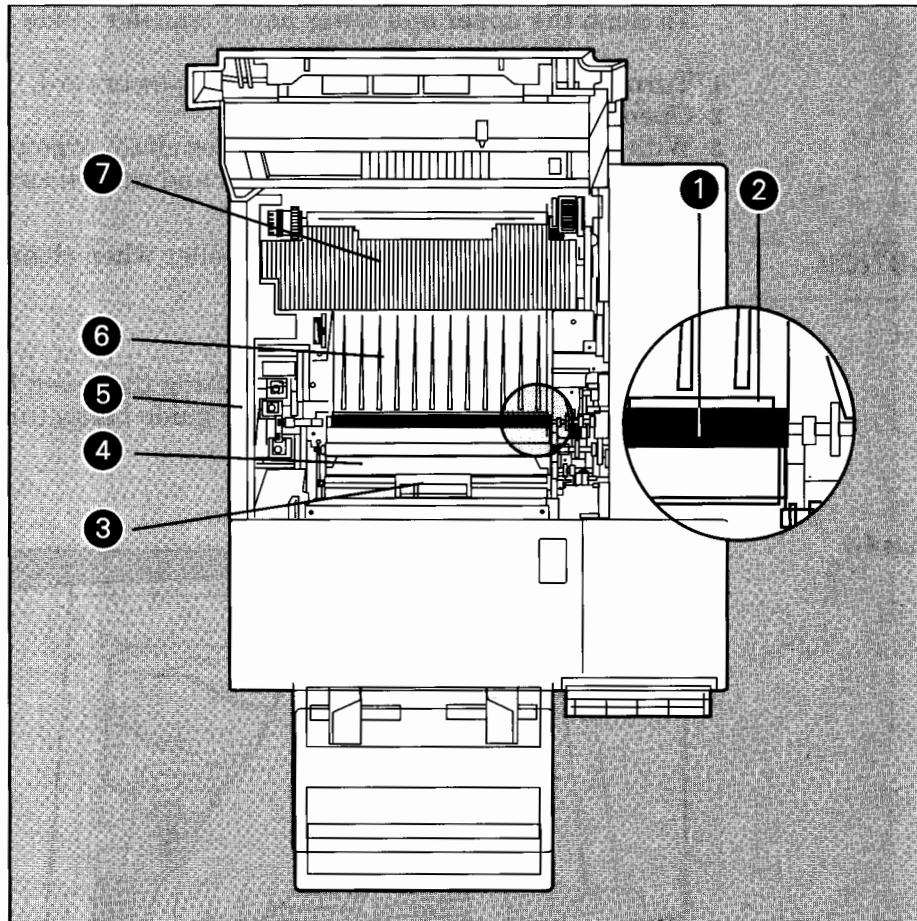
Printer Cleaning Locations (top cover open)

1 Transfer roller *(do not clean).*
2 Antistatic teeth.
3 Upper transfer guide lock tray area (green handle).
4 Lower transfer guide area (silver).

5 Cleaning brush.
6 Paper feed guide (gray metal)
7 Fusing assembly.

Paper Transfer Guide Area

To clean the upper and lower paper transfer guide area:

1 Turn OFF the printer and unplug the power cord.
2 Open the printer's top cover.
3 With a damp (*use water only*) lint-free cloth, wipe residue off the paper transfer guide (green handle) and the adjacent silver metal strip (see Figure 6-5).

CAUTION   Do not touch or clean the transfer roller when cleaning the printer. Reduced print quality can result.

4 Open the paper transfer guide by lifting the green handle, and wipe residue off the lower paper transfer guide below (metal plate with green tab at its left end).
5 Close the paper transfer guide.

Figure 6-5
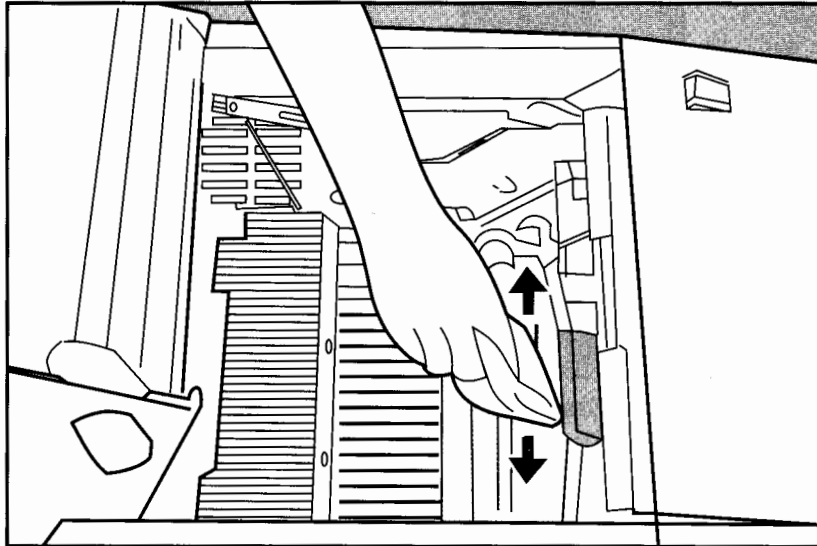
Cleaning the Paper Transfer Guide Area

Antistatic Teeth
Use the brush provided to clean the antistatic teeth.

CAUTION

Be careful not to touch the transfer roller when cleaning the antistatic teeth.

The antistatic teeth are sharp. Use the brush provided to avoid injury to yourself, or damage to the teeth.

1 Locate the antistatic teeth in the long groove beside the transfer roller (see Figure 6-6).
2 Locate the cleaning brush (see ❺ in Figure 6-4).
3 Carefully brush paper and other foreign material from the antistatic teeth.
4 Replace the cleaning brush in its holder.

Figure 6-6
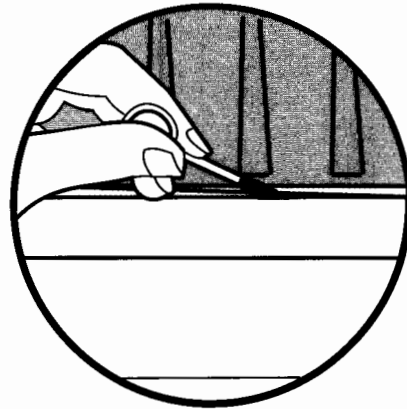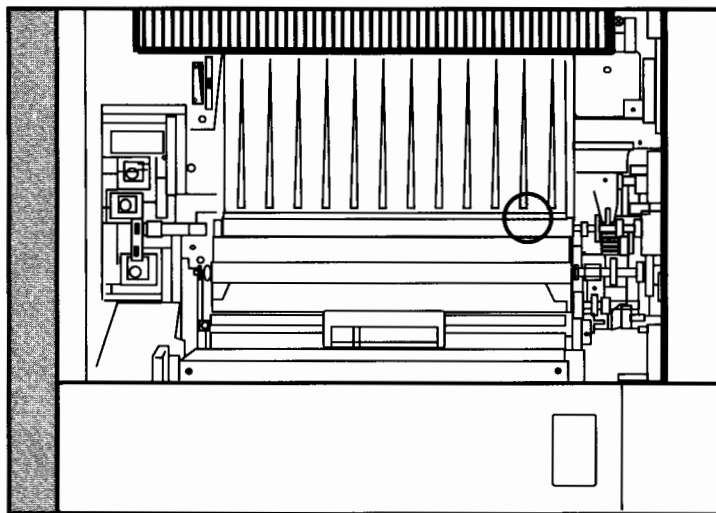
Cleaning the Antistatic Teeth

Paper Feed Guide

Wipe any dust or dirt off the gray metal paper feed guide (see Figure 6-7) with a damp cloth (*use water only*). Be careful not to touch the transfer roller.

WARNING   The adjacent fusing area (labeled (A) in Figure 6-7) gets HOT.

Figure 6-7

Cleaning the Paper Feed Guide

Troubleshooting

Where to Look for Help

Printer difficulties have many causes ranging from simple problems like running out of paper to more difficult ones like incorrect computer-to-printer configuration.

This chapter helps you troubleshoot problems associated with:

- Printer messages
- Clearing paper jams
- Maintaining print quality
- Troubleshooting

Printer Messages

Messages appearing in the control panel display serve one of the following purposes:

- Keep you aware of the printer's operating condition.
- Request that you to perform a task before continuing.
- Indicate there is a hardware or software problem.

Calling for Help

If you try all the suggestions given in this manual and you still need assistance, call the authorized Hewlett-Packard dealer where you purchased your printer.

Printer Messages

Running a printer Self Test (see "Test Menu" in Chapter 2, "Printer
Control Panel") is the best first step when troubleshooting printer
problems. If the printer can successfully print a Self Test, the
problem is not usually printer related. If the printer is the cause of
the problem, the self-test process may generate a printer message
which can provide information about the failure, or the printout can
provide a sample of the print quality problem.

Note

Print quality problems, such as those discussed in this chapter under
"Maintaining Print Quality," do not generate a printer message.

If your printer displayed a printer message in place of the 00 READY
message when running the Self Test or at any other time, see the
following table for help. It lists the printer messages and their
meanings.

Table 7-1

Printer Messages		
Message	**Description**	**Recommended Action**
00 READY	The default ready message. The printer is ready to use.	No action required. If necessary, press **On Line**.
02 WARMING UP	The printer is warming up and is not ready to accept data.	Wait until the printer signals ready. If necessary, press **On Line**.
04 SELF TEST	Printing continuous self test.	Press **On Line** or **Continue** to stop the test. Several more pages may print.
05 SELF TEST	Printer self test in process (non-printing).	No action required.
06 PRINTING TEST	Printing a self test.	No action required.
06 TYPEFACE LIST	Printing a Typeface List. (PCL/PostScript formats different.)	No action required.
06 DEMO PAGE	Printing a Demonstration Page. (PCL/PostScript formats different.)	No action required.
06 CONFIG PAGE	Printing a Post Script Configuration Page.	No action required.
07 RESET	Follows a control panel **Reset** selection. The printer returns all Printing, PCL, Job, Config, and installed personality (such as PS) Menu items to user-selected settings and clears buffered page data, temporary soft fonts, and temporary macros.	No action required unless the printer is receiving data (you may have to press **Reset** several times to prevent printing unwanted pages).
08 COLD RESET	The printer returns all Printing, PCL, Job, Config, Mem Config, Parallel, MIO (if installed), and installed personality (such as PS) Menu settings to their factory default configuration, except for page count and display language.	No action required. When you install an MIO card, you may need to perform a cold reset to reinitialize the printer's control panel. (Use with *extreme caution*. In a shared environment, it should be performed only by the system administrator.) To perform a cold reset, hold down **On Line** while switching ON the printer until 08 COLD RESET appears in the display.

Table 7-1 (cont.)

Printer Messages		
Message	**Description**	**Recommended Action**
09 RST ACTIVE I/O	See Chapter 2, "Printer Control Panel," "Reset Menu," for information.	No action required.
09 RESET ALL I/O	See Chapter 2, "Printer Control Panel," "Reset Menu," for information.	See "Printer Control Panel," "Reset Menu," in chapter 2 for information.
10 RESET TO SAVE	The Printing, PCL, Job, Config, Mem Config, or PS Menus were changed while data, temporary fonts, or temporary macros were present in printer memory, or while the printer was in the middle of a job.	Press **Continue** or **On Line** and your changes remain recorded in the menu (marked with an *) but will not become active until the printer is reset or the job boundary is detected. If you reset the printer (press **Reset**) to immediately activate your selections, you delete temporary macros, temporary fonts, and buffered data.
12 PRINTER OPEN	The printer's top cover is not correctly closed, or your toner cartridge is not installed correctly.	Close the cover firmly, or make sure your toner cartridge is fully seated.
13.x PAPER JAM .1 INTERNL JAM .2 INPUT JAM .3 DUPLEX JAM .4 OUTPUT JAM	Paper is jammed in the paper path. The decimal values which follow indicate the general area where the jam has been sensed. Also, the paper jam sensor at the rear of the fusing assembly may be stuck, causing a false paper jam warning.	Remove jammed paper (see "Clearing Paper Jams" section later in this chapter). In the process of clearing paper, the top cover must be opened and closed again..
14 NO TONER CART	The toner cartridge is not installed correctly.	Insert a toner cartridge or make sure the cartridge is fully seated and the top is fully closed, then press **Continue** or **On Line** to resume.
16 TONER LOW 1 16 TONER LOW 2 16 TONER LOW 3	The toner cartridge is running out of toner.	See "TONER LOW Message" in Chapter 6 for instructions.

7 Troubleshooting

Table 7-1 (cont.)

Printer Messages		
Message	**Description**	**Recommended Action**
FE CARTRIDGE	An accessory cartridge was removed while the printer was on line. (This message appears even if information in the cartridge is not being used.)	Switch OFF the printer, then ON again. (Ensure the printer is *off line* when you remove or reinsert the cartridge.)
FI INSERT TOP FI INSERT BTM	An accessory cartridge was removed from the top or bottom cartridge slot while the printer was in an error state.	Insert the accessory cartridge, clear any pending error conditions, then remove the cartridge.
FR REMOVE TOP FR REMOVE BTM	An accessory cartridge was inserted in the top or bottom cartridge slot while the printer was in an error state.	Remove the accessory cartridge, clear any pending error conditions, then reinsert the cartridge.
MF FEED *paper size*	The printer requested that media be manually fed. *Paper size* may be: LETTER, LEGAL, EXEC, or A4.	Insert the appropriate media size into the manual feed guides and press **On Line** to print, or press **Continue** to feed from the paper tray.
ME FEED *envelope size*	The printer requested that an envelope be manually fed. *Envelope size* may be: COM10, MONARCH, DL, or ENVELOPE.	Insert the appropriate envelope size into the manual feed guides and press **On Line** to print.
UC [LC] LOAD *paper size*	The printer received a request for a paper size not available in the upper (UC) or lower (LC) paper tray, or both the trays were empty. *Paper size* may be: LETTER, LEGAL, EXEC, or A4.	Load the correct paper tray and media and the printer will continue, or press **Continue** to use the media in the installed tray(s). If the paper in the tray is not the same size as requested by the message, the printed image may be clipped.
EE LOAD *envelope size*	The printer received a request for an envelope size that is not currently loaded in the optional envelope feeder. *Envelope size* may be: COM10, MONARCH, or DL.	Load the correct envelope size into the feeder and the printer will continue, or press **Continue** to use the installed feeder.

Table 7-1 (cont.)

Printer Messages		
Message	**Description**	**Recommended Action**
18 UPPER MIO	The upper MIO card is initializing. During initialization the MIO is not active, but since the printer supports I/O switching, the printer remains on line and displays this status message.	No action required. Display clears automatically (this can take up to a minute, depending upon the card).
18 LOWER MIO	The lower MIO card is initializing. During initialization the MIO is not active, but since the printer supports I/O switching, the printer remains on line and displays this status message.	No action required. Display will clear automatically (this can take up to a minute, depending upon the card).
20 MEM OVERFLOW	The printer received more data from the computer than can fit in its available user memory. You may have tried to transfer too many macros or soft fonts, or graphics that were too complex. This problem also is caused by printing too many typefaces at 600 dpi.	Press **Continue** to print the transferred data, then simplify your print job or install additional memory (data loss can result).
21 PRINT OVERRUN	The data (rules, dense text, raster, or vector graphics) sent to the printer was too complex.	Press **Continue** to resume printing. You may lose some data. Reduce page complexity to eliminate the problem, or use the page protection feature described in Chapter 2.
22 ERROR	The computer and printer are not communicating because of improper signal protocols. This is an I/O buffer overrun error.	This can mean a loose cable connection; check for loose cable. If you are using an I/O card other than the standard Bi-Tronics parallel I/O card supplied with the printer, refer to the manual for that device or contact your dealer. If you are on a network, contact your network administrator.

7 Troubleshooting

Table 7-1 (cont.)

Printer Messages		
Message	**Description**	**Recommended Action**
25 XXX MEM FULL	where XXX is the name of the printer personality (PCL, PS). The personality environment save area is full.	To continue printing, press **Continue**; however, some data is lost. To prevent recurrence, reserve more memory for this environment area.
40 ERROR	The printer encountered an error while transferring data from the computer. For network MIO cards, this means there was an abnormal connection break. This is commonly caused by a baud rate mismatch.	Press **Continue** to clear the error message. (If you are using an I/O interface other than the Bi-Tronics parallel I/O, refer to the user's manual for that product.) For network MIO cards, see the user's manual for your card.
49 REMOVE PAGE	A sheet of paper was in the manual feed guides when the printer powered on, or a paper tray with a sheet of paper in its manual feed guides was inserted while the printer was powering on.	Remove the sheets or the tray until the power cycle is complete.
54 ERROR	A problem occurred with the duplex unit shift plate.	Switch OFF the printer, then ON. If the error persists, service is required.
56 ERROR	The envelope feeder is the media input device, but DUPLEX is enabled.	Envelopes cannot be printed in duplex mode. Press the **Continue** key to print this envelope in simplex mode. Turn duplexing off to print more envelopes.
58.X ERROR x=1,2	The lifter mechanism of a paper tray (1=upper, 2=lower) has failed.	Press **Continue**. The printer can still function using the other paper tray. Switch OFF the printer and then ON again to clear the error. If this does not clear the error, call your dealer or HP representative.
If the following errors persist, call your HP-authorized service provider.		
41.[X] ERROR *X=1 - 5*	A temporary error occurred while printing. This error most commonly occurs when the wrong size media is loaded into a tray, or the printer picks two sheets of paper at once.	Remove the page from the output bin and press **Continue**. The page containing the error is automatically reprinted.
50, 53, 57 or 58 SERVICE	The printer identified an internal service error.	If any of these errors appears, switch OFF the printer and then back ON. If the error continues, call your dealer or HP Service Representative. NOTE: To clear the 50 SERVICE error, the printer must be OFF for at least 30 minutes.
51, 52, or 55 ERROR	The printer detected a temporary error.	If any of these errors appears, press **Continue** to resume operation.

Table 7-1 (cont.)

Printer Messages		
Message	**Description**	**Recommended Action**

53.XY.ZZ
ERROR
	An error occurred during configuration and validation of SIMM memory:
	X Hardware Type:
	  0: ROM
	  1: RAM
	Y Hardware Device:
	  0: On-board RAM/ROM
	  1: SIMM Slot 1
	  2: SIMM Slot 2
	  3: SIMM Slot 3
	  4: SIMM Slot 4
	ZZ Error Number:
	  0: Unsupported Memory
	  1: Unrecognized Memory
	  2: Unsupported Memory Size
	  3: Failed RAM Test
	  4: Exceeded Maximum RAM Size
	  5: Exceeded Maximum ROM Size
	  6: Invalid SIMM Speed
	  7: SIMM Reporting Information
	     Incorrectly
	  8: SIMM RAM Parity Error
	 10: SIMM Address Conflict
	 11: SIMM ROM located in illegal
	     address range
	 12: SIMM is too large for
	     available memory
		Make sure your SIMM board is installed correctly (see Appendix F, "SIMM Board Installation."). Replace the SIMM that caused the error. **Continue** enables you to continue but the SIMM that caused the error will not be configured. If the SIMM device has more than one bank of memory, the good banks will be configured.

61.[x] SERVICE X=1-4	The printer encountered a parity error when accessing the RAM memory SIMM in slot "X". If X=0, the slot with the defective SIMM could not be determined.	Switch OFF the printer and then back ON. (Data stored in printer will be lost.) If the error is still present, first verify that the SIMM board is installed correctly. Switch ON the printer. If the error is still present, switch OFF the printer and remove the SIMM board. Switch the printer back ON. If the error message does not appear, the problem is on the SIMM.

7 Troubleshooting

Table 7-1 (cont.)

Printer Messages		
Message	**Description**	**Recommended Action**

62.[x]
SERVICE
X=0 5
	The printer identified a problem while checking its memory. "X" refers to the device the printer was checking when it encountered the error
	   0: Internal Memory
	1-4: SIMM Slot
	   5: Upper Cartridge
	   6: Lower Cartridge
		If the printer contains a SIMM memory board or a type cartridge, switch OFF the printer. (Data stored in the printer will be lost.) Verify that the SIMM board or type cartridge is installed correctly and switch the printer back ON. If the error is still present, switch OFF the printer and remove the SIMM board or type cartridge. Switch the printer back ON. If the error message does not appear, the problem is on the SIMM board or type cartridge.

63 NEEDS SERVICE	The printer found a problem in internal RAM memory.	Switch OFF the printer, than back ON again. (You will lose any data stored in the printer.) If the error appears again, call your dealer or your HP Service Representative.
64, 65, 67 SERVICE	The printer identified an internal service error.	If this error appears, switch OFF the printer, then back ON. If the error continues, call your dealer or HP Service Representative.
68 ERROR	The printer detected an error in the nonvolatile memory (NVRAM).	Press ▩▩▩▩▩, then check your control panel settings.
68 READY/SERVICE	The printer's nonvolatile memory is full or failing. The printer can continue operating, but configuration changes will not be saved in memory.	Press ▩▩▩▩▩. If the error appears again, call your dealer or HP Service Representative.
70, 71 ERROR	A firmware cartridge that cannot work with this printer has been inserted.	Take the printer off-line. Remove this cartridge, and return the printer on-line.
79 SERVICE (XXXX)	An internal controller error has occurred.	Switch OFF the printer, then back ON. If the error appears again, record the numbers following the error message and call your dealer or HP Service Representative. The numbers following the error message indicate the specific type of error.
80 SERVICE (XXXX)	The printer detected a problem in the modular I/O card. The numbers following the error message indicate the specific type of error.	Switch OFF the printer and then back ON. If the error appears again, record the numbers following the error message and call your dealer or HP Service Representative.

Clearable Warnings

A clearable warning indicates a transient condition in the printer. The printer continues on line while the message is displayed in place of 00 READY. A clearable warning appears each time the printer alters resolution or page protection (this causes reconfiguration of memory), aborts a job due to an invalid or uninstalled personality, or encounters a similar temporary condition. A number of clearable warnings can appear during the course of printing a job.

Although most jobs can print, the printer will display a warning to let you know that changes were made to the printer's configuration to accommodate that printing. Some changes in the printed output may occur. Clear the message by pressing **Continue**. For more information about clearable warnings, see Chapter 2, "Printer Control Panel."

Table 7-2

Clearable Warning Messages	
Message Displayed	**Meaning**
W1 IMAGE ADAPT	The printer received a graphics print file that was too complex to print at the requested resolution. Check the printout for loss of data or print quality.
W2 INVALID PERS	The job was not printed because you requested a personality that is not in the printer.
W3 JOB ABORTED	The printer was forced to abort the print job because there was not enough installed memory to support the printer language used. For instance, a PostScript file may have been sent to the printer without enough installed memory to support PostScript printing.
W4 JOB 300/OFF	The job was printed at 300 dpi with page protection off. To print the job as requested, install additional memory (see Table 2-1 on page 2-8).
W5 JOB 300/LTR	The job was printed at 300 dpi with page protection set to letter. To print the job as requested, install additional memory (see Table 2-1 on page 2-8).

Table 7-2 (Cont.)

Clearable Warning Messages	
Message Displayed	**Meaning**
W6 JOB 300/A4	The job was printed at 300 dpi with page protection set to A4. To print the job as requested, install additional memory (see Chapter 2, "Printer Control Panel).
W7 JOB 300/LGL	The job was printed at 300 dpi with page protection set to legal. To print the job as requested, install additional memory (see Chapter 2, "Printer Control Panel).
W9 JOB 600/LTR	The job was printed at 600 dpi with page protection set to letter. To print the job as requested, install additional memory (see Chapter 2, "Printer Control Panel).
W0 JOB 600/A4	The job was printed at 600 dpi with page protection set to A4. To print the job as requested, install additional memory (see Chapter 2, "Printer Control Panel).
WM MEM CNFIG N/A	Because of configuration changes, resource saving is no longer available. If resource saving is desired, print a Self Test page. Check the configuration settings, then reconfigure resource saving.
WM CHECK MEM MGT	There is still sufficient memory to accommodate resource saving, but the current setting cannot be satisfied by the available memory. Reconfigure the resource saving for the current personality.

Special Printer Messages

Certain control panel display messages appear only in special
circumstances, including printer initialization, preventive
maintenance service required, and system switching.

Table 7-3

Special Printer Messages	
Message Displayed	**Meaning**
CONFIG LANGUAGE	This message appears when you hold down the ▓▓Enter▓▓ key while powering OFF the printer and then ON again. You normally set the local language the first time you install the printer.
USER MAINTENANCE	This message is displayed in place of the 00 READY message when the printer has printed 200,000 pages. Refer to the *HP LaserJet 4Si Operator's Guide* for instructions on clearing this message.
MENUS LOCKED	The system or network administrator has placed a security lock on the control panel; changes to most menu items are not allowed. This message automatically is cleared after approximately 2 seconds.

Clearing Paper Jams

If a 13.X message (PAPER JAM) appears, look for jammed paper in the specific area indicated (see Figure 7-1). The circled numbers correspond to the procedures on the following pages. *Paper can also be jammed in other areas or a paper sensor can be blocked; check the entire paper path.*

- 13.1 INTERNL JAM: Open printer top cover and inspect areas (2) and (3).
- 13.2 INPUT JAM: Check paper tray area (1).
- 13.3 DUPLEX JAM: Check duplex areas (5) and (6). (Jams can occur in this area even when printing in simplex mode.)
- 13.4 OUTPUT JAM: Check external and internal output bin area (4).

Note

The top cover of the printer must be opened and then closed to clear the paper jam message from the display.

Ensure that the bin full sensor arm is lowered all the way once the cover is re-closed.

Figure 7-1
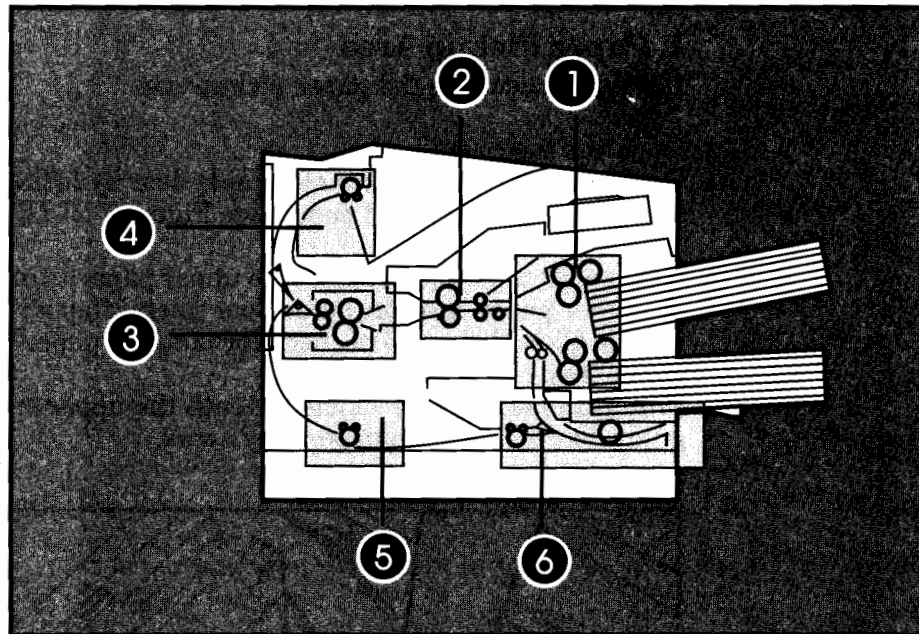
Paper Path Jam Locations

1 Paper pickup area	4 Paper output area	6 Switchback area
2 Image transfer area	5 Duplex area (if duplex -	(if duplex option is
3 Fusing assembly area	option is installed)	installed)

Note

Paper jams occur most often when:

- Your paper or other print media does not meet the proper specifications (see Appendix E, "Media Specifications").
- The media is in poor condition.
- The printer needs cleaning.
- Key operator maintenance parts are wearing out (see "Key Operator Maintenance" in Chapter 6, "User Maintenance and Adjustments").

If paper jams occur frequently, clean the printer and check the quality of your paper or other print media.

1. Paper Pickup Area

If the jam occurs in the paper pickup area:

1 Open the top cover.
2 Open the upper paper transfer guide door by lifting the green handle and remove the jammed paper (see Figure 7-2). (If necessary, remove the paper trays first.)
3 If no paper is visible beneath the upper paper transfer guide door, lift the lower paper transfer guide door (metal flap with small green handle at the left side) to check for jammed paper from the lower paper tray.
4 If no jammed paper is visible beneath the upper or lower paper feed guide doors, check the paper tray areas.

Figure 7-2
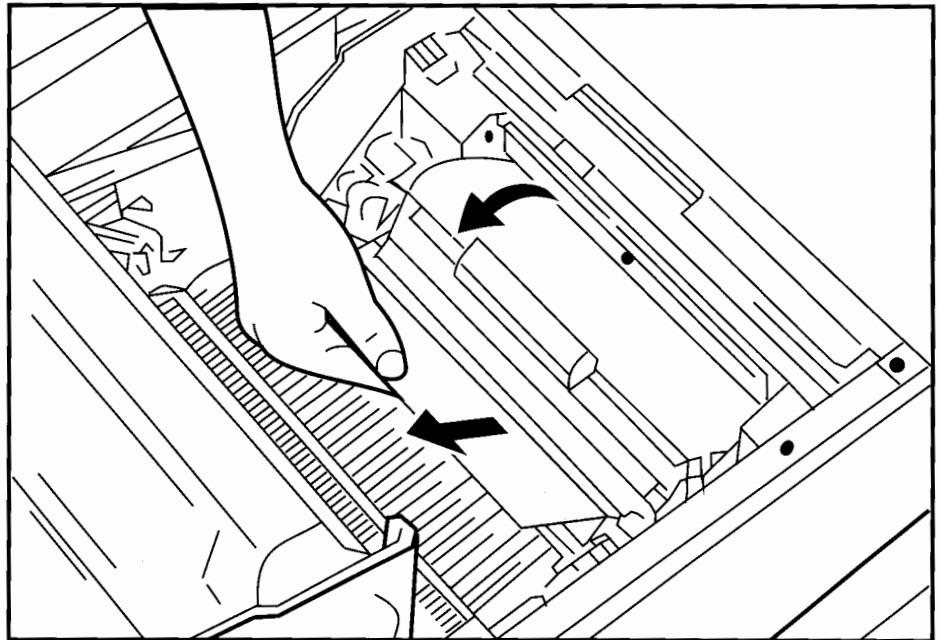
Clearing the Paper Pickup Area

2. Image Transfer Area

If a jam occurs in the transfer guide area, remove the jammed paper by rolling it toward you as shown in Figure 7-3. By rolling the paper toward you, loose (unfused) toner is kept on the paper.

CAUTION

Avoid touching the transfer roller with your fingers, as it will leave fingerprints on the roller surface.

If toner gets on your clothes, wipe it off with a dry cloth and wash the clothes in *cold* water. Hot water sets toner into fabric.

Figure 7-3
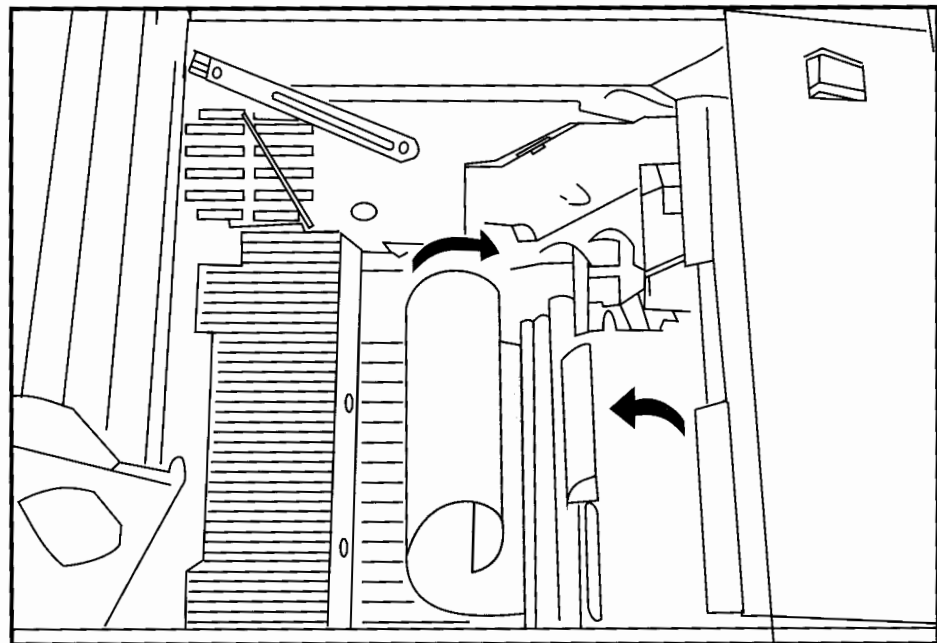
Clearing the Transfer Guide Area (rear view)

3. Fusing Assembly Area

For fusing assembly area paper jams, follow the steps below:

WARNING   The fusing assembly area can become very HOT. Also, be careful not to get toner on your clothing; it can stain.

1 For jams at the front of the fusing assembly, remove the paper by turning the green plastic knob at the left of the fuser. Roll the paper toward you to avoid spilling loose (unfused) toner (see callout "A" in Figure 7-4).

CAUTION   Pull the paper toward the front of the printer, so it stays out of the fusing assembly. Unfused toner on the paper is loose and can fall into the fusing assembly, causing print quality problems.

Figure 7-4
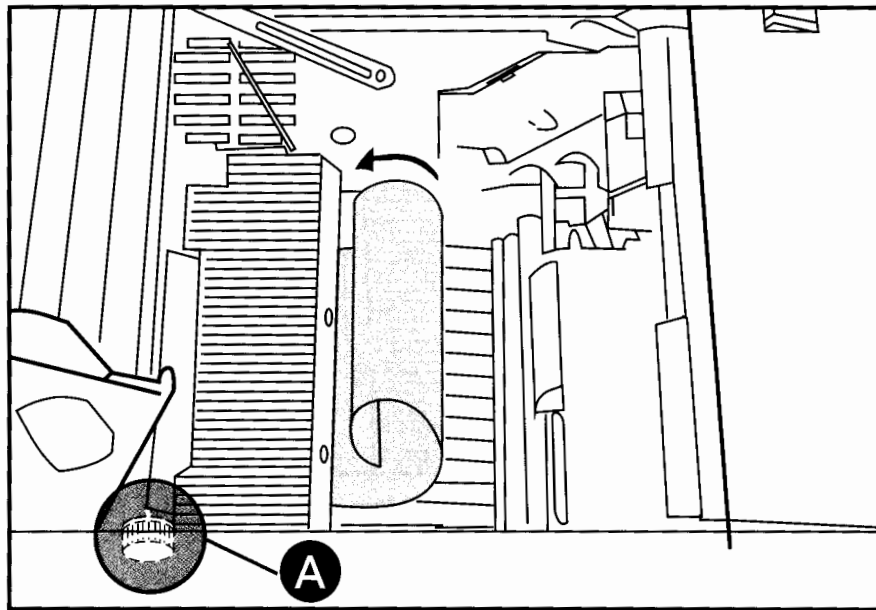
Clearing the Front Fusing Assembly Area

2 For jams at the rear of the fusing assembly, open the fusing assembly's green-colored rear door.

3 Remove the paper by turning the green plastic knob at the left of the fuser (see callout "B" in Figure 7-5) to help feed the paper through the fusing assembly. If necessary, carefully pull the paper up and out (see callout "A" in Figure 7-5). Be careful not to touch the HOT fusing roller or to disturb the paper sensor flag.

Figure 7-5
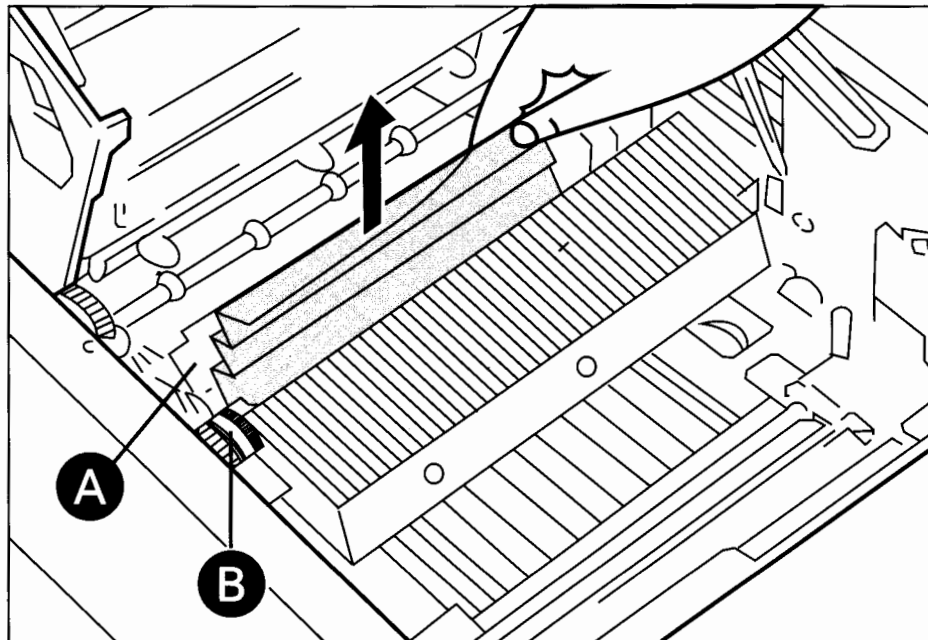
Clearing the Rear Fusing Assembly Area

| CAUTION | Ensure that you *close* the fusing assembly door once you have cleared the jam. Failure to do this can cause damage to the separation claws behind the fuser assembly. |

4. Paper Output Area

1 Open the top cover.

2 If the jammed paper has passed completely through the fusing assembly, grasp the trailing edge and remove it as shown in Figure 7-6.

Figure 7-6
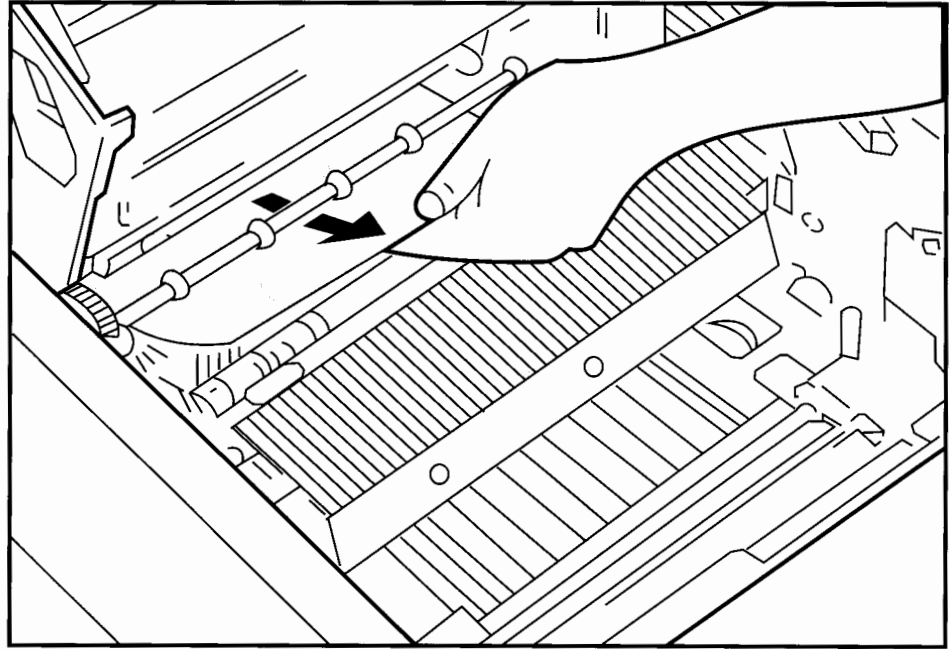
Paper Delivery Area/Fusing Assembly Area

3 If the jammed paper passed partially into the upper output bin, lift the bin full sensor arm (if installed) and slowly pull out the paper (see Figure 7-7). Be careful not to damage the sensor arm. (After removing the paper, be sure the sensor arm is in its lowered position or an OUTPUT BIN FULL attendance message will display on the control panel.)

Figure 7-7
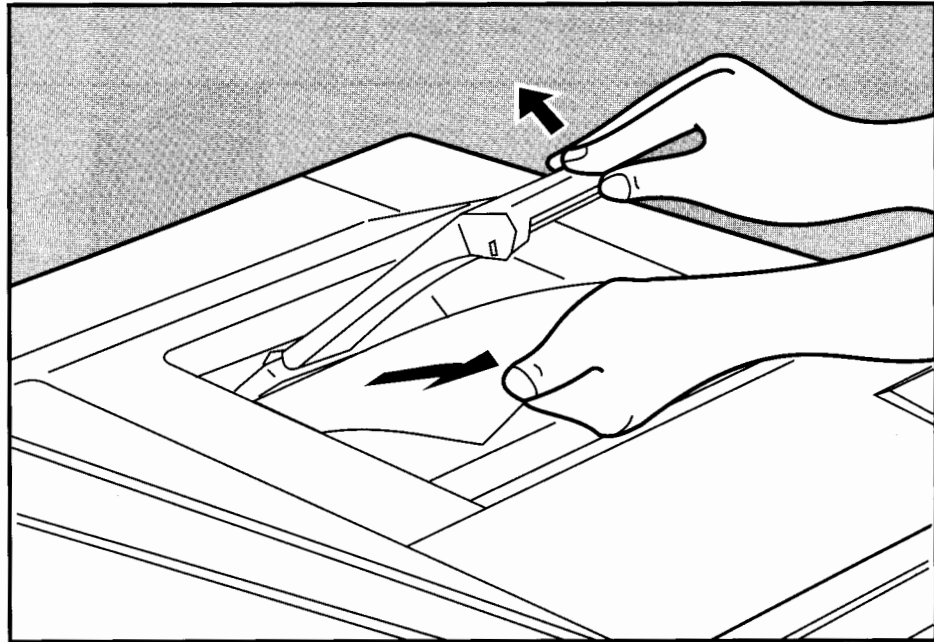
Upper Output Bin Area

5. Duplex Access Area

Jams occur in the duplex area if the duplex unit was installed and you are printing in duplex mode. Jams can also occur in other jam areas during duplex printing, or in the duplex area when single-sided printing. If the latter occurs frequently, you may need to call your service representative.

Access to the duplex area is through a small door on the left side of the printer (see Figure 7-8).

Figure 7-8
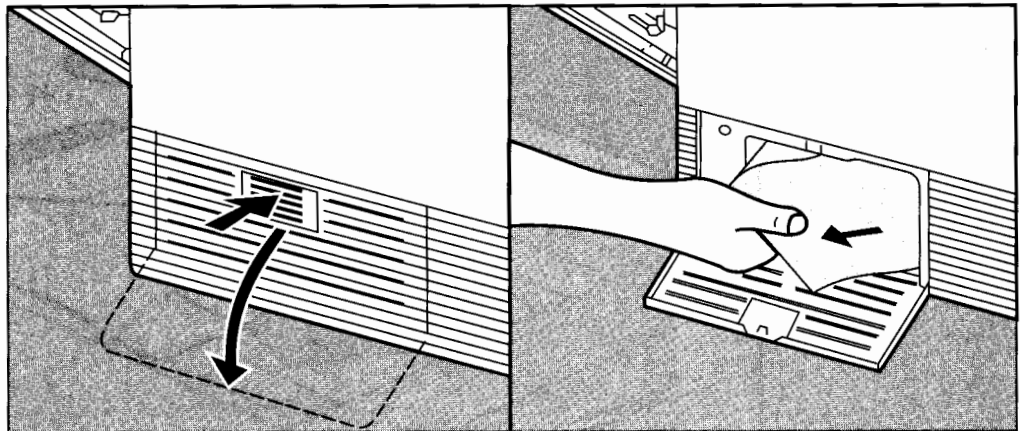
Duplex Paper Path Area

1 Open the duplex access door by pressing on the upper middle edge (see Figure 7-8). The pressure-sensitive door latch clicks and the door springs open.

2 Carefully remove jammed paper (see Figure 7-8).

3 Close the access door.

6. Switchback Area

Remove any paper that protrudes from the switchback area (see Figure 7-9). You may need to remove the lower paper tray to reach the area. (The jammed paper may not be readily visible; check the area carefully. If necessary, check from the duplex area.)

Figure 7-9
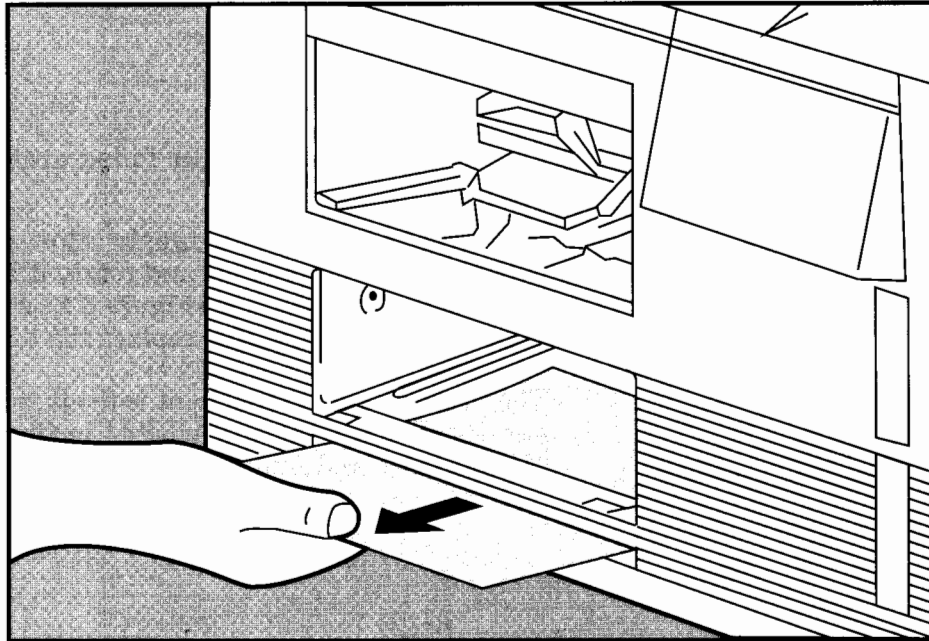
Switchback Area

CAUTION

Do not try to pry out jammed paper with a pointed object, such as a pen or a pencil. Damage to the internal printer mechanism can occur.

If the paper is jammed underneath the black mylar strip in back of the switchback area, be careful not to damage the strip when removing the paper. This strip helps deflect paper moving through the duplex area; damage to the strip will cause paper jams.

Maintaining Print Quality

Samples of common print quality problems appear below, with possible solutions. If the listed solutions do not work, call for help as described in Chapter 8, "Service and Support."
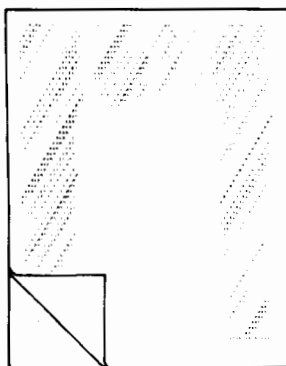
Vertical Fade

If a vertical white streak or faded area appears on the page:

- The toner cartridge toner supply is low. Remove the toner cartridge from the printer and rotate it back and forth. If shaking the cartridge (see Figure 6-2 on page 6-6) does not improve the print quality, replace the toner cartridge.

- The print density adjustment is too light. Adjust the density slide (see "Print Density" in Chapter 6, "User Maintenance and Adjustments").
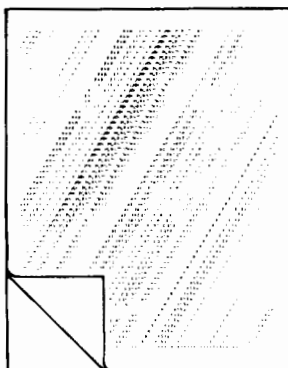
Dropouts

If faded-out areas, generally rounded in shape, occur randomly on the page:

• The moisture content of the paper is uneven, or the paper has moist spots on its surface. Try paper from a different source.

• The paper lot is bad. The manufacturing processes can cause some areas of paper to reject toner. Try paper from a different source.

• The transfer roller is dirty. Replace the transfer roller (see *HP LaserJet 4Si Printer Operator's Guide*).
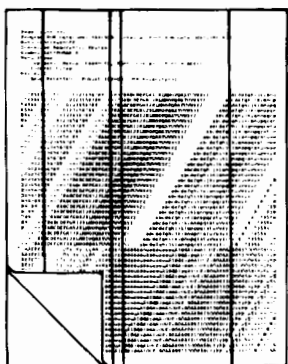
Vertical Lines

If sharp black vertical streaks appear on the page, the photosensitive drum inside the toner cartridge probably was scratched. Replace the toner cartridge.

If smeared black vertical streaks appear, the fuser may be bad. Inspect the rollers for scratches and excessive wear, and, if necessary, replace the Fusing Assembly as described in *HP LaserJet 4Si Printer Operator's Guide.*

7 Troubleshooting
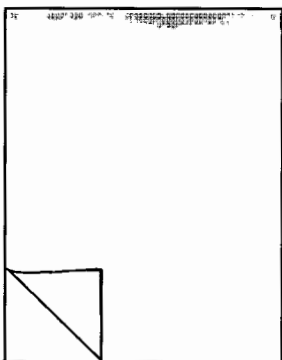
Toner Smear

If toner smears appear on the leading edge of the paper, the paper guides are dirty. Clean the printer as described in "Cleaning the Paper Feed Guide" in Chapter 6, "User Maintenance and Adjustments."
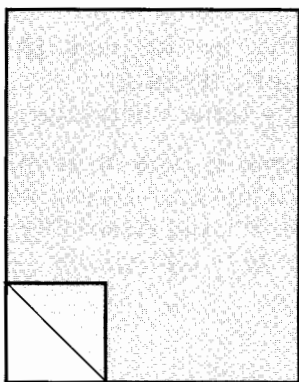
Background Gray Toner Shading

If the amount of background toner shading becomes unacceptable, the following procedures can help to clear the condition.

- Increase the density setting (see "Density" in Chapter 2, "Printer Control Panel"). This decreases the amount of background shading.

- Change to a lighter paper weight (see Appendix E, "Media Specifications").

- Check the printer's environment; very dry (low humidity) conditions can increase the amount of background shading.

- Replace the toner cartridge.

- Replace the Transfer Roller (see the *HP LaserJet 4Si Printer Operator's Guide*).
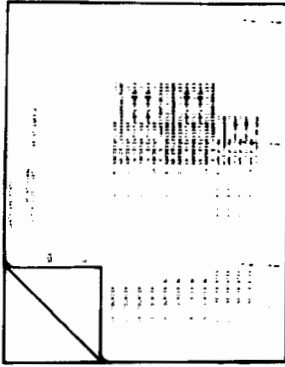
Vertical Repetitive Defects

If unwanted marks appear repeatedly on the printed side of the page:

- The toner cartridge is damaged. The circumference of the toner cartridge drum is 3.75 inches (95 mm). If a repetitive mark occurs every 3.75 inches (95 mm) on the page, replace the toner cartridge.
- The developer roller is defective. If a repetitive mark occurs every 2 inches (51 mm) on the page, replace the toner cartridge.
- The charger roller in the toner cartridge is defective. If a horizontal black line occurs every 1.5 inches (38 mm), replace the toner cartridge.
- The transfer roller has toner on it. If the defects occur every 2.065 inches (53 mm) on the back of the page, the problem usually corrects itself after a few more pages.

Improperly Formed Characters
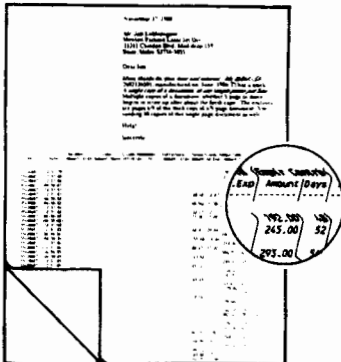
If characters are improperly formed, producing hollow characters, your paper stock may be too slick or may have too high a moisture content. Try a different paper.

If characters are improperly formed, producing a wavy effect, the laser scanner needs service. Call your authorized HP dealer or HP Service Representative.

Troubleshooting

Use the following table to help solve problems you experience with your printer. If you need more help, refer to the service and support information in Chapter 8, "Service and Support." This section helps you determine when to obtain service from your dealer or when to contact Hewlett-Packard for assistance.

For networked printers, check with your network administrator if you suspect a network-related problem.

Table 7-4

Troubleshooting Table

Problem	Recommended Action
Printer does not switch ON.	1. Ensure that the AC power cord is plugged firmly into the receptacle and the printer.
	2. Ensure that the printer's power switch is in the ON position.
	3. Ensure that the line voltage is correct for the printer's power configuration.
	4. Ensure that the power source you plugged the printer into is energized.
The printer cannot produce a self-test printout.	1. Check that the printer is off-line (when selecting Self Test) and that the Ready light is ON.
	2. Check that the paper tray is installed correctly and contains paper.
	3. Check that the printer's top cover is closed.
	4. Check that paper is not jammed in the printer.
	5. If messages appear in the display, review them for help (see "Printer Messages" earlier in this chapter). If no error messages appear but the self test still does not print, call for assistance (see Chapter 8, "Service and Support").
Poor print quality.	1. Redistribute the toner in the toner cartridge (see Chapter 6, "User Maintenance and Adjustment").
	2. Clean the inside of the printer (see Chapter 6, "User Maintenance and Adjustments").
	3. Adjust the print density (see Chapter 2, "Printer Control Panel").
	4. Check the paper type and quality (see Appendix E, "Media Specifications").
	5. Review "Maintaining Print Quality" in this chapter.
	6. Adjust resolution for the type of document you are printing (see "Resolution" in Chapter 2, "Printer Control Panel").
	7. If the above steps do not help, replace the toner cartridge.

Table 7-4 (cont)

Troubleshooting Table (continued)

Problem	Recommended Action
Poor toner fusing.	1. Check that fuser levers are in the down position (see Chapter 6, "User Maintenance and Adjustments"). 2. Check the paper type and quality (see Appendix E, "Media Specifications").
The printer will not print from the host.	1. Check that the printer is on-line. 2. Check that the correct interface cable was selected and securely connected to both the printer and the computer. If not correctly configured, see "Your Guide to Setting Up Your LaserJet 4Si Printer" for configuration information. 3. Run a self test to verify that the interface configurations shown on the printout match those on your host computer (see chapter 2, "Printer Control Panel"). 4. Print a plain MS-DOS file (for example, **dir > prn**) to determine if the problem is with your software application. 5. Check that your computer is working correctly by running an application you know works. 6. if you are sharing the printer through a network or other device, ensure that the sharing mechanism is no the problem by connecting your computer directly to the printer and running an application you know works. 7. Check that your computer's port is configured and working properly. One way to check this is to connect another printer, if available, to that port on your computer and run an application you know works. 8. Check that your computer's operating system configuration files (such as AUTOEXEC.BAT) are set up properly for access by the host application.
Control Panel settings do not work correctly.	1. If the printer was off-line when you tried to change the printer settings: a. Take the printer off-line, then change the settings again as described in Chapter 2 2. If the control panel still does not work correctly, call your service representative.
Print data is not completely printed.	1. If the Form Feed indicator is ON, take the printer off-line and press ▢▢▢▢ to print the page stored in the printer buffer. (You can also use an embedded PCL command to add a form feed character to the end of your print file. See Appendix A, "Printer Commands.") 2. If no printer message is displayed but you are losing data, check your software application to be sure the print files contain no errors.

7 Troubleshooting

Service and
Support

Introduction

Hewlett-Packard stands behind the HP product you purchased. Depending on how you purchase and use your equipment, the best source of support may be your HP dealer, your own organization, or Hewlett-Packard itself. Your warranty statement is included in this chapter (see "Warranty"). Please read it carefully and retain it for your records.

Assistance From Your Organization

If your organization has many HP printers, the best source of assistance may be within your own company. Many companies designate central support personnel to help you when you have problems with your printer, or when you need consumable items such as toner cartridges or paper. These support personnel, in turn, can call special resources within HP when necessary.

Assistance From Your Local Dealer

If you purchased your printer from an HP dealer or large system vendor, your dealer or vendor is the best source of assistance. Your salesperson is familiar with your needs, equipment, configuration, and software and can provide you with the information you need. Your dealer also can access special support resources and programs within HP. Contact your dealer for details on available support options.

Assistance From HP Hardware Support

Recognizing that mechanical parts do wear and that electronic devices do need service occasionally, high-quality, professional hardware support is provided through *HP Personal Computer Dealer Centers* and the world-wide network of *HP Sales and Service Offices.* These offices are listed following the index.

Note
Some countries may require that in order to have your printer serviced by Hewlett-Packard, you must make arrangements to have it serviced in the country of purchase. Check with your authorized HP dealer for your country's requirements.

HP Maintenance Agreements

HP has several types of maintenance agreements that meet a wide range of support needs.

On-Site Service Agreements

To provide you with the support level best suited to your system usage and support budget, HP has on-site service agreements with three response times:

Priority On-Site Service is designed for production-critical applications, giving you four-hour service response to your site for calls made during normal HP business hours.

Next Day On-site Service provides on-site support by the next working day following your service request. Extended coverage hours and extended travel beyond HP designated service zones are available for additional charges on most on-site service agreements.

Weekly (Volume) On-site Service Agreement, for organizations with many HP LaserJet printers, provides economical, scheduled on-site coverage. Designated for customer sites using 25 or more workstation products, this service provides scheduled weekly repair visits to your central location. HP can write an agreement for any combination of 25 or more workstation products including printers, plotters, computers, and disk drives.

8 Service and Support

Warranty

This warranty entitles you to standard warranty services for your printer and is available from HP worldwide. However, there may be local variations in the level of warranty service. You should contact the local HP Service Center to check for the applicable local warranty in your country or province.

One-Year On-Site Limited Warranty

Hewlett-Packard warrants its computer hardware products against defects in materials and workmanship for a period of one year from purchase by the end user. During the warranty period, HP will, at its option, either repair or replace products which prove to be defective.

The warranty period begins either on the date of delivery or, where the purchase price includes installation by Hewlett-Packard, on the date of installation.

Should HP be unable to repair or replace the product within a reasonable amount of time, you will be entitled to a refund of the purchase price if you return the product.

To have your printer serviced by HP you should contact the closest HP Service Center.

Exclusions

The warranty on your HP LaserJet 4Si printer shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer.
- Customer supplied software or interfacing.
- Unauthorized modification or misuse.
- Operation outside of the environmental specifications for the product.
- Operation of non-supported printing media.
- Duty cycle abuse (see note on page 8-5).
- Operating the printer from a mechanical switch box without a designated surge protector.
- Improper site preparation and maintenance.

- Failure to perform key operator maintenance every 200,000 pages.
- Use of non-HP toner cartridges (see the note following), memory boards or interface boards.

Note

The use of a non-HP or refilled toner cartridge alone does not affect either your warranty or any maintenance contract you may have purchased. However, if an HP LaserJet printer failure or damage is found to be attributable directly to the use of a non-HP toner cartridge, HP will not repair the printer free-of-charge. In this case, standard time and materials charges will be applied to service your printer for that particular failure or damage.

Operation of the printer beyond the limit of its duty cycle (printing greater than the equivalent of 75,000 single-sided pages per month) shall be deemed printer abuse and all repairs thereafter will be billed on a time and materials basis.

If you are using a mechanical switch box, ensure that it is equipped with a surge protector. Damage to your printer could occur from the use of unprotected mechanical switch boxes.

Warranty Limitations
The warranty set forth above is exclusive and no other warranty, whether written or oral, is expressed or implied. Hewlett-Packard specifically disclaims the implied warranties of merchantability and fitness for a particular purpose.

Service During the Warranty Period
If your hardware should fail during the warranty period, contact an authorized HP dealer or an HP Customer Service Center.

Service After the Warranty Period
If your hardware fails after the warranty period, contact an authorized HP dealer or your local Customer Service Center. If you have an HP Maintenance Agreement, request service under your agreement.

Commonly Asked Questions

Hewlett-Packard has support services available to help you in case you have questions about your HP LaserJet 4Si printer. Before you call for help, read the following list of questions our customers commonly ask:

Q: What is the benefit of using a network interface card?

A: *Direct-connect network interfaces provide superior data processing speed and location flexibility.*

Q: Is there any way that I can create a document on my IBM PC that uses the IBM Line-drawing set, and have it print correctly on my printer?

A: *Yes, the printer contains the PC-8 symbol set, which you can access using your software or the control panel Printing Menu selection* SYM SET= PC-8.

Q: I am using a proportionally spaced font. How do I get an even right margin?

A: *Right justification with proportionally spaced fonts is a feature of the software package. Determine whether your software provides right justification of proportionally spaced fonts.*

Q: How can I access the PostScript option?

A: *If the PostScript option was installed, your printer automatically switches to PostScript printing if you installed a PostScript printer driver and selected the appropriate printer (or print queue, on a network).*

Q: I printed a Font Printout and am trying to access the internal font for Courier bold, #039. When I use the printer command (#X for accessing a font by its ID number, the printer does not recognize that command. What am I doing wrong?

A: You cannot access the internal or cartridge fonts using the above escape sequence. You can use this sequence only to access soft fonts that you previously downloaded and assigned an ID number. Don't confuse the font # and the soft font ID; they are not the same.

Q: What kind of paper should I use with my HP LaserJet 4Si printer?

A: The HP LaserJet 4Si printer works well with most types of paper. Variables in paper composition and manufacturing can affect print quality and paper handling. Refer to Appendix E, "Media Specifications" for more detailed paper specifications.

Q: What is toner?

A: The toner in Hewlett-Packard LaserJet toner cartridges is presently composed of plastic (styrene or other similar materials), amphorous silica, and iron oxide. The materials are mixed, melted, resolidified, and ground into an extremely fine powder of highly consistent particle size.

Q: Is toner toxic or otherwise harmful?

A: Hewlett-Packard's toner is classified as non-toxic and non-carcinogenic by the U.S. Office of Safety and Health Administration (OSHA), the National Toxicology Program, and the International Agency for Research on Cancer.

8 Service and Support

Q: I replaced my toner cartridge and now nothing is printing. Why?

A: *Make sure you removed the sealing tape from the toner cartridge.*

Q: Can my toner cartridge be refilled when it runs out of toner, or do I have to purchase a new one?

A: *HP does not recommend the use of refilled toner cartridges, because they are not HP products and HP cannot guarantee the print quality results. The electrophotographic drum and the charging roller (located in the toner cartridge) are exceeding their designed life when the toner runs out.*

Q: Does Hewlett-Packard have any plans to recycle toner cartridges?

A: *HP has instituted a recycling program to provide customers an alternative to discarding spent cartridges. The details of this program are available upon request from your authorized HP dealer.*

Q: Why does the first page of my document print with the correct top margin, but then following pages start printing lower, with a larger top margin?

A: *Creeping text occurs when the number of lines per page in your software application exceeds the number of lines per page set for the printer. The printer has a default unprintable region of 3 lines at both the top and bottom of the page, and by default prints 60 lines per page (on 11-inch paper). Most software applications default to 66 lines per page. Set your application software to send only 60 lines per page.*

Q: I do not have a HP LaserJet 4Si/4Si MX printer driver available with my software. What should I use?

A: Printer drivers for several popular applications are shipped with your printer. If a HP LaserJet 4Si printer driver is not available for your application, select the driver definition that is the closest to the printer's features. First try LaserJet 4, then LaserJet IIISi, LaserJet IIID, or LaserJet III printer drivers. (Some features of the LaserJet 4Si may not be available when using these drivers.) Then call your application vendor for information concerning HP LaserJet 4Si printer support.

Q: Can my HP LaserJet 4Si printer support other printer languages?

A: Yes! Although your HP LaserJet 4Si printer is capable of far more features through the PCL 5 language than ever before, HP now provides PostScript™ printer language support. You can order this option through your dealer.

Q: Can my HP LaserJet 4Si printer support other printer language cartridges?

A: Language cartridges (such as PostScript and Epson / ProPrinter cartridges) that worked in previous LaserJet products will not work with the HP LaserJet 4Si printer. Contact the cartridge manufacturer for information regarding their product's compatibility.

8 Service and Support

A

Printer
Commands

Introduction

This chapter contains information on PCL (escape sequences), HP-GL/2, and PJL printer commands. The first part of the appendix gives descriptions and examples of how to format and combine commands. The second part of the appendix gives specific commands.

This chapter contains:

PCL Printer Commands (Escape Sequences)
- PCL Printer Command Syntax
- Using PCL Printer Commands In Your Application
- Forming a Command
- Combining Printer Commands
- Commonly Used PCL Printer Commands

HP-GL/2 Graphics Commands
- Commonly Used HP-GL/2 Graphics Commands
- Using HP-GL/2 Graphics Commands
- HP-GL/2 Example: Drawing Rectangles

Printer Job Language (PJL) Commands

Command Tables
- PCL Commands
- HP-GL/2 Comands
- PJL Commands

PCL Printer Commands (Escape Sequences)

PCL printer commands tell the printer which tasks to perform or fonts to use. Once you know how your software works with the printer, you can enter printer commands indirectly by making software selections or directly through set-up strings or by entering them in the text of your file. Printer commands are also called escape sequences.

Remember that most software applications do not require you to enter printer commands. Refer to your computer and software documentation to find the method to use to enter printer commands.

Note

Before using printer commands, compare these characters:

        Lowercase l: *l*   Uppercase O: O
        Number one: 1   Number zero: Ø

Many printer commands use the lowercase letter l (*l*) and the number one (1), or the uppercase letter O (O) and the number zero (Ø). These characters may not appear on your screen as shown here.

PCL Printer Command Syntax

Figure A-1 displays the elements of a typical printer command (for page orientation here).

Figure A-1
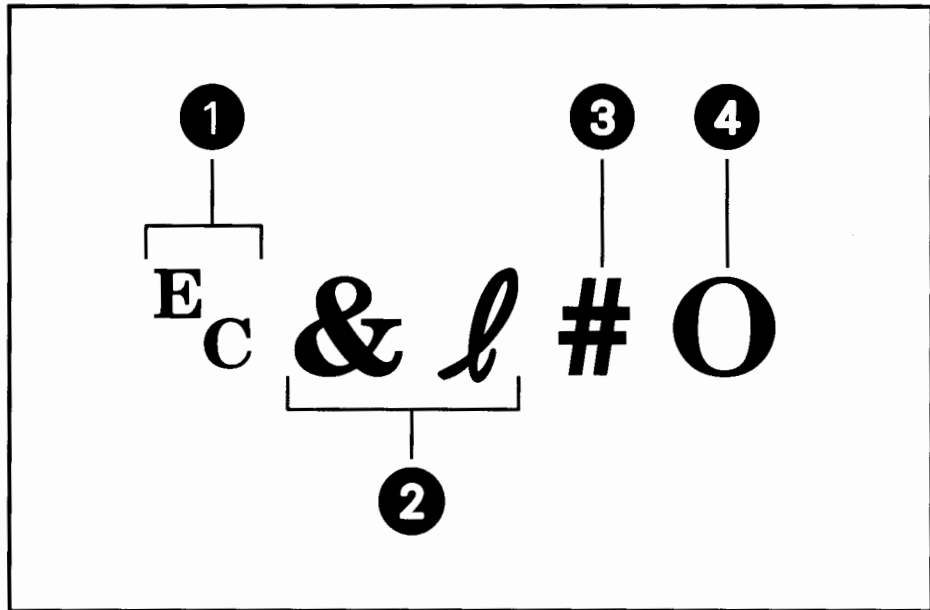
Printer Command Explanation

1 Escape character (begins escape sequence).
2 Type of command.
3 Value field.
4 Uppercase letter that terminates the escape sequence.
   The following printer command, with value field set to "1", sets the page orientation to landscape:

^{E}c&ℓ1O

Using PCL Printer Commands In Your Application

Many software packages provide a wide range of printing features without requiring PCL printer commands inserted directly into the text. This section provides information useful when you do want to embed commands directly.

Escape Character

Printer commands always begin with the escape character (Ec). The escape character Ec is often represented by:

- 1B (Hexadecimal).
- 27 (Decimal).

Usually, the Ec character does not appear on your screen. Instead, a different character appears, depending on the software you are using. How you insert the escape character Ec and what it looks like on your screen depends on your software package (common examples are shown in table A-1).

Table A-1

Software Escape Character Commands

Software Package	Entry	What Appears
Lotus 1-2-3 and Symphony	Type \027	\027
Microsoft Word	Hold down ALT key and type 027 on the numeric keypad	←
WordPerfect	Type <27>	<27>

Forming a Printer Command

In printer commands, the escape character precedes additional characters (ASCII characters) or hexadecimal representations of these characters. For example, the landscape orientation command can be entered using these ASCII characters (\027) in Lotus 1-2-3:

\027&ℓ1O

Most printer commands have a value field for which you must supply a number. This number can be a literal value such as 12.00 for point size or a representative value as in the preceeding example where **1** signified landscape orientation. A # within a printer command (see Figure A-1) means you should enter a number for the quantity or value you want in place of the # sign.

All printer commands end with an uppercase letter.

Note
- Printer commands are *case sensitive*. Make sure you enter uppercase and lowercase letters correctly (see "Combining Printer Commands").
- A command that the printer receives stays in effect through the current job until changed by a subsequent command. For example, if you send the printer a command to change the left margin, each page will print with that margin setting until you send a new margin command or reset the printer.
- To reset the printer, send the reset printer command (ᴱcE). Alternatively, you may take the printer off line and hold down **Shift** **Reset** until 07 RESET appears in the display.

Network Note
You may wish to include the reset printer command (ᴱcE) at the beginning and end of each job you send to the printer. This will ensure that you begin your print job with a known set of default values, and that your settings won't affect the next user's job.

Combining Printer Commands

Some printer commands can be combined before sending them to the printer. With some software applications, you may need to shorten the string of commands because of limited allowable string length.

These two printer commands set the page size to letter and the orientation to landscape:

^{E}c&ℓ2A and ^{E}c&ℓ1O

They can be combined and sent to the printer like this:

^{E}c&ℓ2a1O

Notice that the ^{E}c, the &, and the ℓ are dropped from the second printer command when they are combined. Also, the upper-case "A" that ended the first command becomes a lower-case "a" when these commands are combined.

Use these three rules to combine and shorten printer commands:

- The first two characters after ^{E}c must be the same in all printer commands you want to combine. In the example above, these characters are & and ℓ.
- All alphabetic characters within the combined printer commands must be lowercase except the final letter. In the combined example above, A becomes a because it is no longer the final (terminating) character. The final character in the printer command must always be uppercase to tell the printer the command sequence is complete.
- Printer commands take effect as your software encounters them (from left to right). Be sure to combine printer commands in the order in which the printer should perform them. (The tables in this appendix present the commands in approximately this order.) The *PCL 5 Printer Language Technical Reference Manual* contains detailed information on printer command hierarchy.

A Printer Commands

Commonly Used PCL Printer Commands

Table A-2 lists some of the commonly used PCL printer commands. For a complete list, see Table A-5.

Table A-2

Common PCL Printer Commands

Printer Command	Function	# Refers To
^{E}cE	Resets the printer.	
^{E}c&*l*#X	Indicates number of copies.	1 to 99
^{E}c&*l*#H	Selects paper source	Ø = print from current source. 1 = upper paper tray 2 = manual feed - paper 3 = manual feed - envelope 4 = lower paper tray 5 = not used by LaserJet 4Si 6 = envelope feeder
^{E}c&*l*#A	Sets paper size.	1 = executive 2 = letter 3 = legal 26 = A4 1ØØ = not used by LaserJet 4Si 8Ø = monarch 81 = commercial 1Ø 9Ø = DL 91 = not used by LaserJet 4Si
^{E}c&*l*#O	Selects orientation.	Ø = portrait 1 = landscape 2 = reverse portrait 3 = reverse landscape

Table A-2 (cont)

Common PCL Printer Commands (continued)

Printer Command	Function	# Refers To
^{E}c&a#P	Selects print direction.	Degrees of counterclockwise rotation in 90° increments (0°, 90°, 180°, 270°)
^{E}c&a#L	Sets left margin.	Column number
^{E}c&a#M	Sets right margin.	Column number
^{E}c&ℓ#E	Sets top margin.	Number of lines
^{E}c&ℓ#D	Sets line spacing.	Lines per inch: (1,2,3,4,6,8,12,16,24, or 48)
^{E}c&d#D	Begins underline.	Ø = fixed 3 = floating
^{E}c&d@	Ends underline.	(not applicable)
^{E}c(#X	Selects primary downloaded font by ID.	Soft font ID number
^{E}c)#X	Selects secondary downloaded font by ID.	Soft font ID number
^{E}c&k#H	Sets horizontal motion index.	$\frac{1}{120}$ inch increments
^{E}c&ℓ#C	Sets vertical motion index.	$\frac{1}{48}$ inch increments
^{E}c(s#V	Selects a font of the point size (height) specified by #.	$\frac{1}{72}$ inch increments

A Printer Commands

HP-GL/2 Graphics Commands

Your HP LaserJet 4Si or 4Si MX printer has the ability to print
vector (line) graphics using the HP-GL/2 graphics language. HP-GL/2
is becoming an industry standard graphics language for pen plotters
and is used by many software programs. Some of the features of
HP-GL/2 include rotating text at *any* angle, creating mirrored images
of text, combining HP-GL/2 plots with high quality LaserJet fonts,
and importing existing HP-GL/2 files into word processing or desktop
publishing files.

Using HP-GL/2 commands, you can "draw" circles, rectangles and
lines that will print much more quickly than using standard PCL
language raster graphics. HP-GL/2 commands allow you to create a
graph (or import an existing HP-GL/2 graph) and scale it to a desired
size and place it anywhere on the printed page.

Printing with HP-GL/2 requires leaving the PCL printer language
mode and entering HP-GL/2 mode. Figure A-2 displays the
components of a typical HP-GL/2 commands:

Note

If you are interested in programming with HP-GL/2 printer
commands, order the *PCL 5 Printer Language Technical Reference
Manual*.

Using HP-GL/2 Graphics Commands

If your software does not automatically send HP-GL/2 graphics
commands, try entering them directly into your job file using printer
commands. Because many of these codes are complex, order the *PCL
5 Printer Language Technical Reference Manual* to learn about using
these commands.

Figure A-2 shows the components of the HP-GL/2 "Pen Up" command.

Figure A-2
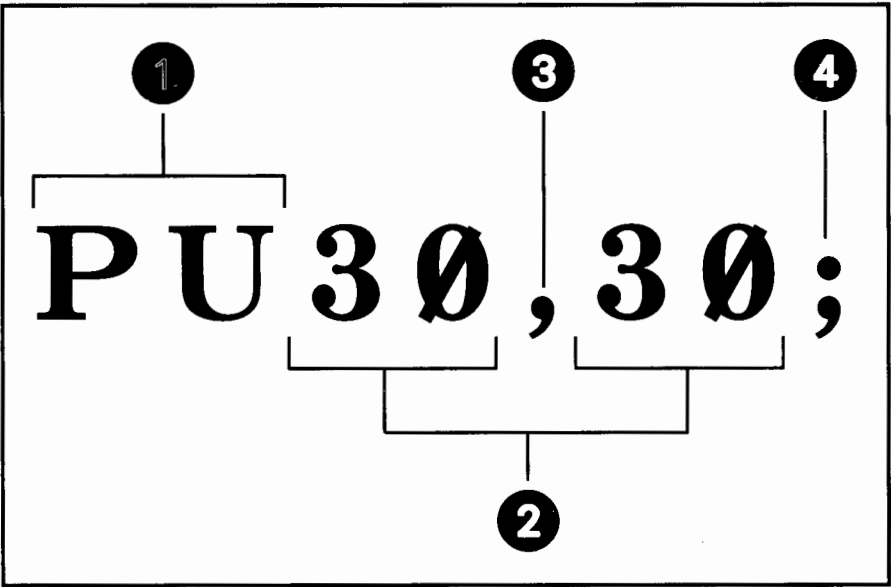
HP-GL/2 Graphics Command Explanation

Table A-3

1	Mnemonic	– Begins and specifies the type of command
2	Parameter(s)	– Value field
3	Separator(s)	– Between fields
4	Terminator	– Ends command

A Printer Commands

Commonly Used HP-GL/2 Graphics Commands

Table A-4 lists some of the commonly used HP-GL/2 graphics language commands. A complete list of HP-GL/2 commands is provided in Table A-6.

Table A-4

Commonly Used HP-GL/2 Graphics Commands

Memonic	Command	Summary
IN	Initialize	Resets all programmable HP-GL/2 functions to their default settings.
CI	Circle	Draws the circumference of a circle using a specified radius and chord (arc) angle.
PD	Pen Down	Lowers the "pen" to the page (for drawing lines).
PU	Pen Up	Lifts the "pen" from the page (for cursor movement without drawing).
SP	Select Pen	The SP command must be used in order to enable printing.
PA	Plot Absolute	Plots a line from the current cursor position to the absolute point coordinates provided.
PR	Plot Relative	Plots a line from the current cursor position to a relative new position
EA	Edge Rectangle Absolute	Defines and outlines a rectangle using absolute coordinates.
FP	Fill Polygon	Fills the defined polygon (or rectangle) with currently specified line and/or fill types.
CF	Character Fill Mode	Specifies the way scalable fonts are filled and edged.
SD	Standard Font Definition	Defines the standard font and its attributes, such as typeface, height, and symbol set.
SS	Select Standard Font	Activates the standard font designated in the Standard Font Definition (SD).
LB	Label	Prints text using the currently defined font.
DI	Absolute Direction	Specifies the slope or direction at which labels (text) are drawn.
FT	Fill Type	Sets the shading pattern used to fill polygons (or rectangles).
PW	Pen Width	Specifies a new width for lines drawn by the logical pen. The default pen width is about 1 point (0.35 mm).
SC	Scale	Establishes units of measurement for the X- and Y-axes of your drawing.

Bitmapped fonts can only be filled with raster PCL language patterns.

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HP-GL/2 Example: Drawing Rectangles

Study this example to learn how the PCL language and HP-GL/2 graphics commands can be used to "draw" a rectangle. The command is written in one string; there is no need to insert carriage returns or other characters between commands.

ᴱcEᴱc%ØBIN;SP1;PU5Ø,5Ø;EA25ØØ,15ØØ;ᴱc%ØAᴱcE

where:

ᴱcE	Reset the printer.
ᴱc%ØB	Enter HP-GL/2 mode.
IN;	Initialize HP-GL/2 mode.
SP1;	Select pen number 1 (black). (You must select a pen to print HP-GL/2 images.)
PU5Ø,5Ø;	Lift the "pen" and move to absolute coordinate (50,50).
EA25ØØ,15ØØ;	Draw the outline of a rectangle, with the lower left corner being the current pen location (50,50) and the upper right corner being (2500,1500 plu).[1]
ᴱc%ØA	Enter PCL mode.
ᴱcE	Reset and eject the page.

One plotter unit (plu) equals 0.025mm or 0.00098 in. There are 40 plu per millimeter and 1016 plu per inch.

Rectangle Created with HP-GL/2 Commands
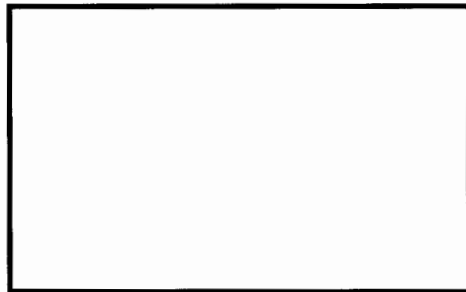
Printer Job Language (PJL) Commands

Use printer Job Language (PJL) commands for regulating print jobs in an environment where more than one user is accessing the same printer (such as a shared printer or some network applications). PJL also provides the means for communicating certain printer status conditions back to the user. For complete information on the use of PJL, refer to *Printer Job Language Technical Reference Manual* which is provided as part of the PCL Technical Reference Documentation package.

The PJL commands are listed in the back of this appendix in table A-8.

Command Tables

You can use the following PCL, HP-GL/2, and PJL command tables to send commands to your printer.

HP LaserJet Printer Commands—PCL

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
JOB CONTROL COMMANDS							
Reset							
Reset		E_CE		027 069		1B 45	
Number of Copies	# of Copies (1-99)	E_C&ℓ#X	(x)	027 038 108 #...# 088	(120)	1B 26 6C #...# 58	(78)
Long-Edge (Left) Offset Registration	# of Decipoints (1/720")	E_C&ℓ#U	(u)	027 038 108 #...# 085	(117)	1B 26 6C #...# 55	(75)
Short-Edge (Top) Offset Registration	# of Decipoints (1/720")	E_C&ℓ#Z	(z)	027 038 108 #...# 090	(122)	1B 26 6C #...# 5A	(7A)
Unit of Measure	# = Number of units per inch	E_C&u#D	(d)	027 038 117 #...# 068	(100)	1B 26 75 #...# 44	(64)
PAGE CONTROL COMMANDS							
Page Length and Size							
Paper Source	Eject Page	E_C&ℓØH	(h)	027 038 108 048 072	(104)	1B 26 6C 30 48	(68)
	Upper Paper Tray	E_C&ℓ1H	(h)	027 038 108 049 072	(104)	1B 26 6C 31 48	(68)
	Manual Feed	E_C&ℓ2H	(h)	027 038 108 050 072	(104)	1B 26 6C 32 48	(68)
	Manual Envelope Feed	E_C&ℓ3H	(h)	027 038 108 051 072	(104)	1B 26 6C 33 48	(68)
	Lower Tray	E_C&ℓ4H	(h)	027 038 108 052 072	(104)	1B 26 6C 34 48	(68)
	Envelope Feeder	E_C&ℓ6H	(h)	027 038 108 054 072	(104)	1B 26 6C 36 48	(68)
Output bin	Upper bin	E_C&ℓ1G	(g)	027 038 108 049 071	(103)	1B 25 6C 31 47	(67)
	Rear (lower) bin	E_C&ℓ2G	(g)	027 038 108 050 071	(103)	1B 25 6C 32 47	(67)
Page Size	Executive	E_C&ℓ1A	(a)	027 038 108 049 065	(97)	1B 26 6C 31 41	(61)
	Letter	E_C&ℓ2A	(a)	027 038 108 050 065	(97)	1B 26 6C 32 41	(61)
	Legal	E_C&ℓ3A	(a)	027 038 108 051 065	(97)	1B 26 6C 33 41	(61)
	A4	E_C&ℓ26A	(a)	027 038 108 050 054 065	(97)	1B 26 6C 32 36 41	(61)
	B5	E_C&ℓ1ØØA	(a)	027 038 108 049 048 048 065	(97)	1B 26 6C 31 30 30 41	(61)
	Monarch	E_C&ℓ8ØA	(a)	027 038 108 056 048 065	(97)	1B 26 6C 38 30 41	(61)
	COM 10	E_C&ℓ81A	(a)	027 038 108 056 049 065	(97)	1B 26 6C 38 31 41	(61)
	DL	E_C&ℓ9ØA	(a)	027 038 108 057 048 065	(97)	1B 26 6C 39 30 41	(61)
	C5	E_C&ℓ91A	(a)	027 038 108 057 049 065	(97)	1B 26 6C 39 31 41	(61)
Page Length	# of Lines (5–128)	E_C&ℓ#P	(p)	027 038 108 #...# 080	(112)	1B 26 6C #...# 050	(70)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
Orientation							
Orientation	Portrait	E_C&l∅O	(o)	027 038 108 048 079	(111)	1B 26 6C 30 4F	(6F)
	Landscape	E_C&l1O	(o)	027 038 108 049 079	(111)	1B 26 6C 31 4F	(6F)
	Reverse Portrait	E_C&l2O	(o)	027 038 108 050 079	(111)	1B 26 6C 32 4F	(6F)
	Reverse Landscape	E_C&l3O	(o)	027 038 108 051 079	(111)	1B 26 6C 33 4F	(6F)
Print Direction	# Degrees of Rotation (counterclockwise. 90°increments only)	E_C&a#P		027 038 097 #...# 080	(112)	1B 26 61 #...# 50	(70)
Margins and Text Length							
Top Margin	# of Lines	E_C&l#E	(e)	027 038 108 #...# 069	(101)	1B 26 6C #...# 45	(65)
Text Length	# of Lines	E_C&l#F	(f)	027 038 108 #...# 070	(102)	1B 26 6C #...# 46	(66)
Left Margin	# of Columns	E_C&a#L	(l)	027 038 097 #...# 076	(108)	1B 26 61 #...# 4C	(6C)
Right Margin	# of Columns	E_C&a#M	(m)	027 038 097 #...# 077	(109)	1B 26 61 #...# 4D	(6D)
Clear Horizontal Margins		E_C9		027 057		1B 39	
Perforation Skip Mode							
Perforation Skip	Disable	E_C&l∅L	(l)	027 038 108 048 076	(108)	1B 26 6C 30 4C	(6C)
	Enable	E_C&l1L	(l)	027 038 108 049 076	(108)	1B 26 6C 31 4C	(6C)
Horizontal Column Spacing							
Horizontal Motion Index (HMI)	# of 1/120" Increments	E_C&k#H	(h)	027 038 107 #...# 072	(104)	1B 26 6B #...# 48	(68)
Vertical Line Spacing							
Vertical Motion Index (VMI)	# of 1/48" Increments	E_C&l#C	(c)	027 038 108 #...# 067	(99)	1B 26 6C #...# 43	(63)
Line Spacing (Lines per inch)	1 line/inch	E_C&l1D	(d)	027 038 108 049 068	(100)	1B 26 6C 31 44	(64)
	2 lines/inch	E_C&l2D	(d)	027 038 108 050 068	(100)	1B 26 6C 32 44	(64)
	3 lines/inch	E_C&l3D	(d)	027 038 108 051 068	(100)	1B 26 6C 33 44	(64)
	4 lines/inch	E_C&l4D	(d)	027 038 108 052 068	(100)	1B 26 6C 34 44	(64)
	6 lines/inch	E_C&l6D	(d)	027 038 108 054 068	(100)	1B 26 6C 36 44	(64)
	8 lines/inch	E_C&l8D	(d)	027 038 108 056 068	(100)	1B 26 6C 38 44	(64)
	12 lines/inch	E_C&l12D	(d)	027 038 108 049 050 068	(100)	1B 26 6C 31 32 44	(64)
	16 lines/inch	E_C&l16D	(d)	027 038 108 049 054 068	(100)	1B 26 6C 31 36 44	(64)
	24 lines/inch	E_C&l24D	(d)	027 038 108 050 052 068	(100)	1B 26 6C 32 34 44	(64)
	48 lines/inch	E_C&l48D	(d)	027 038 108 052 056 068	(100)	1B 26 6C 34 38 44	(64)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
CURSOR POSITIONING							
Vertical and Horizontal							
Vertical Position	# of Rows	E_C&a#R	(r)	027 038 097 #...# 082	(114)	1B 26 61 #...# 52	(72)
	# of Dots	E_C*p#Y	(y)	027 042 112 #...# 089	(121)	1B 2A 70 #...# 59	(79)
	# of Decipoints	E_C&a#V	(v)	027 038 097 #...# 086	(118)	1B 26 61 #...# 56	(76)
Horizontal Position	# of Columns	E_C&a#C	(c)	027 038 097 #...# 067	(99)	1B 26 61 #...# 43	(63)
	# of Dots	E_C*p#X	(x)	027 042 112 #...# 088	(120)	1B 2A 70 #...# 58	(78)
	# of Decipoints	E_C&a#H	(h)	027 038 097 #...# 072	(104)	1B 26 61 #...# 48	(68)
Half Line Feed		E_C=		027 061		1B 3D	
End-of-Line Termination							
Line Termination	CR=CR; LF=LF; FF=FF	E_C&kØG	(g)	027 038 107 048 071	(103)	1B 26 6B 30 47	(67)
	CR=CR+LF; LF=LF; FF=FF	E_C&k1G	(g)	027 038 107 049 071	(103)	1B 26 6B 31 47	(67)
	CR=CR; LF=CR+LF; FF=CR+FF	E_C&k2G	(g)	027 038 107 050 071	(103)	1B 26 6B 32 47	(67)
	CR=CR+LF; LF=CR+LF; FF=CR+FF	E_C&k3G	(g)	027 038 107 051 071	(103)	1B 26 6B 33 47	(67)
Push/Pop Position							
Push/Pop Position	Push	E_C&fØS	(s)	027 038 102 048 083	(115)	1B 26 66 30 53	(73)
	Pop	E_C&f1S	(s)	027 038 102 049 083	(115)	1B 26 66 31 53	(73)
FONT SELECTION							
Symbol Set Selection [1]							
Primary Symbol Set	ISO 60: Norwegian	E_C(ØD		027 040 048 068		1B 28 30 44	
	ISO 4: United Kingdom	E_C(1E		027 040 049 069		1B 28 31 45	
	Windows 3.1 Latin 2	E_C(9E		027 040 057 069		1B 28 39 45	
	ISO 69: French	E_C(1F		027 040 049 070		1B 28 31 46	
	ISO 21: German	E_C(1G		027 040 049 071		1B 28 31 47	
	ISO 15: Italian	E_C(ØI		027 040 048 073		1B 28 30 49	
	Microsoft Publishing	E_C(6J		027 040 054 074		1B 28 36 4A	

1 Additional symbol sets are supported. Refer to the PCL-5 Comparison Guide.

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Table A-5 (cont.)

HP LaserJet Printer Commands—PCL (continued)				
Function	Parameter	Command	Decimal Value	Hexadecimal Value
Symbol Set Selection[1]				
Primary Symbol Set	DeskTop	E_C(7J	027 040 055 074	1B 28 37 4A
	PS Text	E_C(10J	027 040 049 048 074	1B 28 31 30 4A
	MC Text	E_C(12J	027 040 049 050 074	1B 28 31 32 4A
	Ventura International	E_C(13J	027 040 049 051 074	1B 28 31 33 4A
	Ventura US	E_C(14J	027 040 049 052 074	1B 28 31 34 4A
	Wingdings	E_C(579L	027 040 053 055 057 076	1B 28 35 37 39 4C
	PS Math	E_C(5M	027 040 053 077	1B 28 35 4D
	Ventura Math	E_C(6M	027 040 054 077	1B 28 36 4D
	Math-8	E_C(8M	027 040 056 077	1B 28 38 4D
	Symbol	E_C(19M	027 040 049 057 077	1B 28 31 39 4D
	ISO 8859-1 (ECMA-94) Latin 1	E_C(0N	027 040 048 078	1B 28 30 4E
	ISO 8859-2: Latin 2	E_C(2N	027 040 050 078	1B 28 32 4E
	ISO 8859-9: Latin 5	E_C(5N	027 040 053 078	1B 28 35 4E
	ISO 11: Swedish	E_C(0S	027 040 048 083	1B 28 30 53
	ISO 17: Spanish	E_C(2S	027 040 050 083	1B 28 32 53
	Windows 3.1 Latin 5	E_C(5T	027 040 053 084	1B 28 35 54
	PC Turkish	E_C(9T	027 040 057 084	1B 28 39 54
	ISO 6: ASCII	E_C(0U	027 040 048 085	1B 28 30 55
	Legal	E_C(1U	027 040 049 085	1B 28 31 55
	Roman-8	E_C(8U	027 040 056 085	1B 28 38 55
	Windows 3.0 Latin 1	E_C(9U	027 040 057 085	1B 28 39 55
	PC-8	E_C(10U	027 040 049 048 085	1B 28 31 30 55
	PC-8 D/N	E_C(11U	027 040 049 049 085	1B 28 31 31 55
	PC 850	E_C(12U	027 040 049 050 085	1B 28 31 32 55
	Pi Font	E_C(15U	027 040 049 053 085	1B 28 31 35 55
	PC-852	E_C(17U	027 040 049 055 085	1B 28 31 37 55
	Windows 3.1 Latin 1 (ANSI)	E_C(19U	027 040 049 057 085	1B 28 31 39 55

1 Additional symbol sets are supported. Refer to the PCL-5 Comparison Guide.

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Function	Parameter	Command		Decimal Value		Hexadecimal Value	
HP LaserJet Printer Commands—PCL (continued)							
				Spacing			
Primary Spacing	Fixed	E_c(s0P	(p)	027 040 115 048 080	(112)	1B 28 73 30 50	(70)
	Proportional	E_c(s1P	(p)	027 040 115 049 080	(112)	1B 28 73 31 50	(70)
				Pitch			
Primary Pitch	# Characters/inch	E_c(s#H	(h)	027 040 115 #...# 072	(104)	1B 28 73 #...# 48	(68)
Set Pitch Mode	10.0	E_c&k0S	(s)	027 038 107 048 083	(115)	1B 26 6B 30 53	(73)
	Compressed (16.5-16.7)	E_c&k2S	(s)	027 038 107 050 083	(115)	1B 26 6B 32 53	(73)
	Elite (12.0)	E_c&k4S	(s)	027 038 107 052 083	(115)	1B 26 6B 34 53	(73)
				Point Size			
Primary Height	# Points	E_c(s#V	(v)	027 040 115 #...# 086	(118)	1B 28 73 #...# 56	(76)
				Style [1]			
Primary Style	Upright (Solid)	E_c(s0S	(s)	027 040 115 048 083	(115)	1B 28 73 30 53	(73)
	Italic	E_c(s1S	(s)	027 040 115 049 083	(115)	1B 28 73 31 53	(73)
	Condensed	E_c(s4S	(s)	027 040 115 052 083	(115)	1B 28 73 34 53	(73)
	Condensed Italic	E_c(s5S	(s)	027 040 115 053 083	(115)	1B 28 73 35 53	(73)
	Compressed (Extra Condensed)	E_c(s8S	(s)	027 040 115 056 083	(115)	1B 28 73 38 53	(73)
	Expanded	E_c(s24S	(s)	027 040 115 050 052 083	(115)	1B 28 73 32 34 53	(73)
	Outline	E_c(s32S	(s)	027 040 115 051 050 083	(115)	1B 28 73 33 32 53	(73)
	Inline	E_c(s64S	(s)	027 040 115 054 052 083	(115)	1B 28 73 36 34 53	(73)
	Shadowed	E_c(s128S	(s)	027 040 115 049 050 056 083	(115)	1B 28 73 31 32 38 53	(73)
	Outline Shadowed	E_c(s160S	(s)	027 040 115 049 054 048 083	(115)	1B 28 73 31 36 30 53	(73)

[1]Additional style values may be obtained from the related documentation provided with HP's font products.
PCL 5 LaserJet printers allow you to specify complex structures (contours, outlines, shading, etc.) and widths as well as posture. Refer to the *HP PCL 5 Printer Language Technical Reference Manual*.

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Table A-5 (cont.)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
				Stroke Weight			
Primary Font Stroke Weight	Ultra Thin	E_C(s-7B	*(b)*	027 040 115 045 055 066	*(98)*	1B 28 73 2D 37 42	
	Extra Thin	E_C(s-6B	*(b)*	027 040 115 045 054 066	*(98)*	1B 28 73 2D 36 42	*(62)*
	Thin	E_C(s-5B	*(b)*	027 040 115 045 053 066	*(98)*	1B 28 73 2D 35 42	*(62)*
	Extra Light	E_C(s-4B	*(b)*	027 040 115 045 052 066	*(98)*	1B 28 73 2D 34 42	*(62)*
	Light	E_C(s-3B	*(b)*	027 040 115 045 051 066	*(98)*	1B 28 73 2D 33 42	*(62)*
	Demi Light	E_C(s-2B	*(b)*	027 040 115 045 050 066	*(98)*	1B 28 73 2D 32 42	*(62)*
	Semi Light	E_C(s-1B	*(b)*	027 040 115 045 049 066	*(98)*	1B 28 73 2D 31 42	*(62)*
	Medium (book or text)	E_C(s0B	*(b)*	027 040 115 048 066	*(98)*	1B 28 73 30 42	*(62)*
	Semi Bold	E_C(s1B	*(b)*	027 040 115 049 066	*(98)*	1B 28 73 31 42	*(62)*
	Demi Bold	E_C(s2B	*(b)*	027 040 115 050 066	*(98)*	1B 28 73 32 42	*(62)*
	Bold	E_C(s3B	*(b)*	027 040 115 051 066	*(98)*	1B 28 73 33 42	*(62)*
	Extra Bold	E_C(s4B	*(b)*	027 040 115 052 066	*(98)*	1B 28 73 34 42	*(62)*
	Black	E_C(s5B	*(b)*	027 040 115 053 066	*(98)*	1B 28 73 35 42	*(62)*
	Extra Black	E_C(s6B	*(b)*	027 040 115 054 066	*(98)*	1B 28 73 36 42	*(62)*
	Ultra Black	E_C(s7B	*(b)*	027 040 115 055 066	*(98)*	1B 28 73 37 42	*(62)*
				Primary Typeface Family			
Typeface Family	Albertus	E_C(s4362T	*(t)*	027 040 115 052 051 054 050 084	*(116)*	1B 28 73 34 33 36 32 54	*(74)*
	Antique Olive	E_C(s4168T	*(t)*	027 040 115 052 049 054 056 084	*(116)*	1B 28 73 34 31 36 38 54	*(74)*
	Clarendon	E_C(s4140T	*(t)*	027 040 115 052 049 052 048 084	*(116)*	1B 28 73 34 31 34 30 54	*(74)*
	Coronet	E_C(s4116T	*(t)*	027 040 115 052 049 049 054 084	*(116)*	1B 28 73 34 31 31 36 54	*(74)*
	Courier	E_C(s4099T	*(t)*	027 040 115 052 048 057 057 084	*(116)*	1B 28 73 34 30 39 39 54	*(74)*
	Garamond Antiqua	E_C(s4197T	*(t)*	027 040 115 052 049 057 055 084	*(116)*	1B 28 73 34 31 39 37 54	*(74)*
	Letter Gothic	E_C(s4102T	*(t)*	027 040 115 052 049 048 050 084	*(116)*	1B 28 73 34 31 30 32 54	*(74)*
	Marigold	E_C(s4297T	*(t)*	027 040 115 052 050 057 055 084	*(116)*	1B 28 73 34 32 39 37 54	*(74)*
	CG Omega	E_C(s4113T	*(t)*	027 040 115 052 049 049 051 084	*(116)*	1B 28 73 34 31 31 33 54	*(74)*
	CG Times	E_C(s4101T	*(t)*	027 040 115 052 049 048 049 084	*(116)*	1B 28 73 34 31 30 31 54	*(74)*
	Univers	E_C(s4148T	*(t)*	027 040 115 052 049 052 056 084	*(116)*	1B 28 73 34 31 34 38 54	*(74)*
	Arial	E_C(s16602T	*(t)*	027 040 115 049 054 054 048 050 084	*(116)*	1B 28 73 31 36 36 30 32 54	*(74)*
	Times New Roman	E_C(s16901T	*(t)*	027 040 115 049 054 057 048 049 084	*(116)*	1B 28 73 31 36 39 30 31 54	*(74)*
	Symbol	E_C(s16686T	*(t)*	027 040 115 049 054 054 056 054 084	*(116)*	1B 28 73 31 36 36 38 36 54	*(74)*
	Wingdings	E_C(s31402T	*(t)*	027 040 115 051 049 052 048 050 084	*(116)*	1B 28 73 33 31 34 30 32 54	*(74)*

HP LaserJet Printer Commands—PCL (continued)				
Function	Parameter	Command	Decimal Value	Hexadecimal Value
Font Default				
Font Default	Primary Font	E_C(3@	027 040 051 064	1B 28 33 40
	Secondary Font	E_C)3@	027 041 051 064	1B 29 33 40
Underline				
Underline	Enable Fixed	E_C&dØD _(d)_	027 038 100 048 068 _(100)_	1B 26 64 30 44 _(64)_
	Enable Floating	E_C&d3D _(d)_	027 038 100 051 068 _(100)_	1B 26 64 33 44 _(64)_
	Disable	E_C&d@	027 038 100 064	1B 26 64 40
Transparent Print				
Transparent Print Data	# of Bytes	E_C&p#X[Data]	027 038 112 #...# 088	1B 26 70 #...# 58

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Table A-5 (cont.)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
FONT MANAGEMENT							
Assign Font ID	Font ID #	Ec*c#D	(d)	027 042 099 #...# 068	(100)	1B 2A 63 #...# 44	(64)
Font and Character Control	Delete all Fonts	Ec*c0F	(f)	027 042 099 048 070	(102)	1B 2A 63 30 46	
	Delete all temporary fonts	Ec*c1F	(f)	027 042 099 049 070	(102)	1B 2A 63 31 46	(66)
	Delete last font ID specified	Ec*c2F	(f)	027 042 099 050 070	(102)	1B 2A 63 32 46	(66)
	Delete last character specified	Ec*c3F	(f)	027 042 099 051 070	(102)	1B 2A 63 33 46	(66)
	Make font temporary	Ec*c4F	(f)	027 042 099 052 070	(102)	1B 2A 63 34 46	(66)
	Make font permanent	Ec*c5F	(f)	027 042 099 053 070	(102)	1B 2A 63 35 46	(66)
	Copy/Assign the currently invoked font as temporary	Ec*c6F	(f)	027 042 099 054 070	(102)	1B 2A 63 36 46	(66)
Soft Symbol Set Management / Creation							
Set Symbol Set	ID #	Ec*c#R	(r)	027 042 099 #...# 082	(114)	1B 2A 63 #...# 52	(72)
Define Symbol Set	# of Bytes	Ec(f#W[Data]		027 040 102 #...# 087		1B 28 66 #...# 57	
Symbol Set Control	Delete all symbol sets	Ec*c0S	(s)	027 042 099 048 083	(115)	1B 2A 63 30 53	(73)
	Delete all temporary symbol sets	Ec*c1S	(s)	027 042 099 049 083	(115)	1B 2A 63 31 53	(73)
	Delete current soft symbol set (last ID#)	Ec*c2S	(s)	027 042 099 050 083	(115)	1B 2A 63 32 53	(73)
	Make current soft symbol set temporary	Ec*c4S	(s)	027 042 099 052 083	(115)	1B 2A 63 34 53	(73)
	Make current soft symbol set permanent	Ec*c5S	(s)	027 042 099 053 083	(115)	1B 2A 63 35 53	(73)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
		Font Selection by ID Number					
Select font (with ID #)	ID # primary font	E_C(#X		027 040 #...# 088		1B 28 #...# 58	
	ID # secondary font	E_C)#X		027 041 #...# 088		1B 29 #...# 58	
		Soft Font Creation					
Font descriptor (font header)	# of bytes	E_C)s#W[Data]		027 041 115 #...# 087		1B 29 73 #...# 57	
Download character	# of bytes	E_C(s#W[Data]		027 040 115 #...# 087		1B 28 73 #...# 57	
Character code	Character code # (decimal)	E_C*c#E	(e)	027 042 099 #...# 069	(101)	1B 2A 63 #...# 45	(65)
		GRAPHICS					
		Raster Graphics					
Raster Resolution	75 dots/inch	E_C*t75R	(r)	027 042 116 055 053 082	(114)	1B 2A 74 37 35 52	(72)
	100 dots/inch	E_C*t1ØØR	(r)	027 042 116 049 048 048 082	(114)	1B 2A 74 31 30 30 52	(72)
	150 dots/inch	E_C*t15ØR	(r)	027 042 116 049 053 048 082	(114)	1B 2A 74 31 35 30 52	(72)
	200 dots/inch	E_C*t2ØØR	(r)	027 042 116 050 048 048 082	(114)	1B 2A 74 32 30 30 52	(72)
	300 dots/inch	E_C*t3ØØR	(r)	027 042 116 051 048 048 082	(114)	1B 2A 74 33 30 30 52	(72)
	600 dots/inch	E_C*t6ØØR	(r)	027 042 116 054 048 048 082	(114)	1B 2A 74 36 30 30 52	(72)

Table A-5 (cont.)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
				Orientation			
				Raster Graphics			
Raster Graphics Presentation	Follows orientation	E_C*r0F	(f)	027 042 114 048 070	(102)	1B 2A 72 30 46	(66)
	Follows physical page	E_C*r3F	(f)	027 042 114 051 070	(102)	1B 2A 72 33 46	(66)
Start Raster Graphics	Left Raster Graphics Margin	E_C*r0A	(a)	027 042 114 048 065	(97)	1B 2A 72 30 41	(61)
	Current Cursor	E_C*r1A	(a)	027 042 114 049 065	(97)	1B 2A 72 31 41	(61)
Raster Y Offset	# of Raster Lines of vertical movement	E_C*b#Y	(y)	027 042 098 #...# 089	(121)	1B 2A 62 #...# 59	(79)
Set Raster Compression Mode	Unencoded	E_C*b0M	(m)	027 042 098 048 077	(109)	1B 2A 62 30 4D	
	Run-Length Encoded	E_C*b1M	(m)	027 042 098 049 077	(109)	1B 2A 62 31 4D	(6D)
	Tagged Image File Format	E_C*b2M	(m)	027 042 098 050 077	(109)	1B 2A 62 32 4D	(6D)
	Delta Row	E_C*b3M	(m)	027 042 098 051 077	(109)	1B 2A 62 33 4D	(6D)
	Adaptive compression	E_C*b5M	(m)	027 042 098 053 077	(109)	1B 2A 62 35 4D	(6D)
Transfer Raster Data by row	# of Bytes	E_C*b#W[Data]		027 042 098 #...# 087		1B 2A 62 #...# 57	
End Raster Graphics	Old version	E_C*rB	(b)	027 042 114 066	(98)	1B 2A 72 42	(62)
	Preferred	E_C*rC	(c)	027 042 114 067	(99)	1B 2A 72 43	(63)
Raster Height	# Raster Rows	E_C*r#T	(t)	027 042 114 #...# 084	(116)	1B 2A 72 #...# 54	(74)
Raster Width	# Pixels of the Specified Resolution	E_C*r#S	(s)	027 042 114 #...# 083	(115)	1B 2A 72 #...# 53	(73)

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HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
THE PRINT MODEL							
Imaging							
Select Current Pattern	Solid Black (default)	E_c*vØT	(t)	027 042 118 048 084	(116)	1B 2A 76 30 54	(74)
	Solid White	E_c*v1T	(t)	027 042 118 049 084	(116)	1B 2A 76 31 54	(74)
	HP-defined Shading Pattern	E_c*v2T	(t)	027 042 118 050 084	(116)	1B 2A 76 32 54	(74)
	HP-defined Cross-Hatched Pattern	E_c*v3T	(t)	027 042 118 051 084	(116)	1B 2A 76 33 54	(74)
	User defined pattern	E_c*v4T	(t)	027 042 118 052 084	(116)	1B 2A 76 34 54	(74)
Source Transparency Mode	Transparent	E_c*vØN	(n)	027 042 118 048 078	(110)	1B 2A 76 30 4E	
	Opaque	E_c*v1N	(n)	027 042 118 049 078	(110)	1B 2A 76 31 4E	(6E)
Pattern Transparency Mode	Transparent	E_c*vØO	(o)	027 042 118 048 079	(111)	1B 2A 76 30 4F	
	Opaque	E_c*v1O	(o)	027 042 118 049 079	(111)	1B 2A 76 31 4F	(6F)
Rectangle Dimensions							
Rectangle Width (Horizontal Size)	# of dots	E_c*c#A	(a)	027 042 099 #...# 065	(97)	1B 2A 63 #...# 41	
	# of decipoints	E_c*c#H	(h)	027 042 099 #...# 072	(104)	1B 2A 63 #...# 48	(68)
Rectangle Height (Vertical Size)	# of dots	E_c*c#B	(b)	027 042 099 #...# 066	(98)	1B 2A 63 # ... # 42	
	# of decipoints	E_c*c#V	(v)	027 042 099 #...# 086	(118)	1B 2A 63 #...# 56	(76)

Table A-5 (cont.)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
		Rectangular Area Fill					
Fill Rectangular Area	Solid Black	E_C*c0P	(p)	027 042 099 048 080	(112)	1B 2A 63 30 50	(70)
	Erase (solid white fill)	E_C*c1P	(p)	027 042 099 049 080	(112)	1B 2A 63 31 50	(70)
	Shaded Fill	E_C*c2P	(p)	027 042 099 050 080	(112)	1B 2A 63 32 50	(70)
	Cross-hatched Fill	E_C*c3P	(p)	027 042 099 051 080	(112)	1B 2A 63 33 50	(70)
	User-Defined	E_C*c4P	(p)	027 042 099 052 080	(112)	1B 2A 63 34 50	(70)
	Current Pattern	E_C*c5P	(p)	027 042 099 053 080	(112)	1B 2A 63 35 50	(70)
Pattern ID	%of Shading or Type of Pattern or User Pattern ID	E_C*c#G	(g)	027 042 099 #...# 071	(103)	1B 2A 63 #...# 47	(67)
Shading	2% Gray	E_C*c2G	(g)	027 042 099 050 071	(103)	1B 2A 63 32 47	(67)
	10% Gray	E_C*c10G	(g)	027 042 099 049 048 071	(103)	1B 2A 63 31 30 47	(67)
	15% Gray	E_C*c15G	(g)	027 042 099 049 053 071	(103)	1B 2A 63 31 35 47	(67)
	30% Gray	E_C*c30G	(g)	027 042 099 051 048 071	(103)	1B 2A 63 33 30 47	(67)
	45% Gray	E_C*c45G	(g)	027 042 099 052 053 071	(103)	1B 2A 63 34 35 47	(67)
	70% Gray	E_C*c70G	(g)	027 042 099 055 048 071	(103)	1B 2A 63 37 30 47	(67)
	90% Gray	E_C*c90G	(g)	027 042 099 057 048 071	(103)	1B 2A 63 39 30 47	(67)
	100% Gray	E_C*c100G	(g)	027 042 099 049 048 048 071	(103)	1B 2A 63 31 30 30 47	(67)
Pattern	1 Horiz.Line	E_C*c1G	(g)	027 042 099 049 071	(103)	1B 2A 63 31 47	(67)
	2 Vert. Lines	E_C*c2G	(g)	027 042 099 050 071	(103)	1B 2A 63 32 47	(67)
	3 Diagonal Lines	E_C*c3G	(g)	027 042 099 051 071	(103)	1B 2A 63 33 47	(67)
	4 Diagonal Lines	E_C*c4G	(g)	027 042 099 052 071	(103)	1B 2A 63 34 47	(67)
	5 Square Grid	E_C*c5G	(g)	027 042 099 053 071	(103)	1B 2A 63 35 47	(67)
	6 Diagonal Grid	E_C*c6G	(g)	027 042 099 054 071	(103)	1B 2A 63 36 47	(67)

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
USER DEFINED PATTERN / MANAGEMENT CREATION							
Define Pattern	# of bytes	$_C$*c#W[Data]		027 042 099 #...# 087	*(119)*	1B 2A 63 #...# 57	*(77)*
User-Defined Pattern Control	Delete all patterns	$_C$*c0Q	*(q)*	027 042 099 048 081	*(113)*	1B 2A 63 030 51	*(71)*
	Delete all temporary patterns	$_C$*c1Q	*(q)*	027 042 099 049 081	*(113)*	1B 2A 63 031 51	*(71)*
	Delete current pattern	$_C$*c2Q	*(q)*	027 042 099 050 081	*(113)*	1B 2A 63 032 51	*(71)*
	Make pattern temporary	$_C$*c4Q	*(q)*	027 042 099 052 081	*(113)*	1B 2A 63 034 51	*(71)*
	Make pattern permanent	$_C$*c5Q	*(q)*	027 042 099 053 081	*(113)*	1B 2A 63 035 51	*(71)*
Set Pattern Reference	Rotate with orientation	$_C$*p0R	*(r)*	027 042 112 048 082	*(114)*	1B 2A 70 30 52	*(72)*
Point	Follow physical page	$_C$*p1R	*(r)*	027 042 112 049 082	*(114)*	1B 2A 70 31 52	*(72)*
MACROS							
Macro ID	Macro ID #	$_C$&f#Y	*(y)*	027 038 102 #...# 089	*(121)*	1B 26 66 #...# 59	*(79)*
Macro Control	Start Macro Def.	$_C$&f0X	*(x)*	027 038 102 048 088	*(120)*	1B 26 66 30 58	*(78)*
	Stop Macro Def.	$_C$&f1X	*(x)*	027 038 102 049 088	*(120)*	1B 26 66 31 58	*(78)*
	Execute Macro	$_C$&f2X	*(x)*	027 038 102 050 088	*(120)*	1B 26 66 32 58	*(78)*
	Call Macro	$_C$&f3X	*(x)*	027 038 102 051 088	*(120)*	1B 26 66 33 58	*(78)*
	Enable Overlay	$_C$&f4X	*(x)*	027 038 102 052 088	*(120)*	1B 26 66 34 58	*(78)*
	Disable Overlay	$_C$&f5X	*(x)*	027 038 102 053 088	*(120)*	1B 26 66 35 58	*(78)*
	Delete Macros	$_C$&f6X	*(x)*	027 038 102 054 088	*(120)*	1B 26 66 36 58	*(78)*
	Delete All Temp. Macros	$_C$&f7X	*(x)*	027 038 102 055 088	*(120)*	1B 26 66 37 58	*(78)*
	Delete Macro ID	$_C$&f8X	*(x)*	027 038 102 056 088	*(120)*	1B 26 66 38 58	*(78)*
	Make Temporary	$_C$&f9X	*(x)*	027 038 102 057 088	*(120)*	1B 26 66 39 58	*(78)*
	Make Permanent	$_C$&f10X	*(x)*	027 038 102 049 048 088	*(120)*	1B 26 66 31 30 58	*(78)*

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
				Status Readback			
Set Status Readback Location Type	Invalid Location	E_C*s0T	(t)	027 042 115 048 084	(116)	1B 2A 73 30 54	(74)
	Currently Selected	E_C*s1T	(t)	027 042 115 049 084	(116)	1B 2A 73 31 54	(74)
	All Locations	E_C*s2T	(t)	027 042 115 050 084	(116)	1B 2A 73 32 54	(74)
	Internal	E_C*s3T	(t)	027 042 115 051 084	(116)	1B 2A 73 33 54	(74)
	Downloaded	E_C*s4T	(t)	027 042 115 052 084	(116)	1B 2A 73 34 54	(74)
	Cartridge	E_C*s5T	(t)	027 042 115 053 084	(116)	1B 2A 73 35 54	(74)
	User-Installed ROM (SIMMs)	E_C*s7T	(t)	027 042 115 055 084	(116)	1B 2A 73 37 54	(74)
Set Status Readback Location Unit	All entities of the Location Type	E_C*s0U	(u)	027 042 115 048 085	(117)	1B 2A 73 30 55	(75)
	Entity 1 or Temporary	E_C*s1U	(u)	027 042 115 049 085	(117)	1B 2A 73 31 55	(75)
	Entity 2 or Permanent	E_C*s2U	(u)	027 042 115 050 085	(117)	1B 2A 73 32 55	(75)
	Entity 3	E_C*s3U	(u)	027 042 115 051 085	(117)	1B 2A 73 33 55	(75)
	Entity 4	E_C*s4U	(u)	027 042 115 052 085	(117)	1B 2A 73 34 55	(75)
Inquire Status Readback Entity	Font	E_C*s0I	(i)	027 042 115 048 073	(105)	1B 2A 73 30 49	(69)
	Macro	E_C*s1I	(i)	027 042 115 049 073	(105)	1B 2A 73 31 49	(69)
	User-defined Pattern	E_C*s2I	(i)	027 042 115 050 073	(105)	1B 2A 73 32 49	(69)
	Symbol Set	E_C*s3I	(i)	027 042 115 051 073	(105)	1B 2A 73 33 49	(69)
	Font Extended	E_C*s4I	(i)	027 042 115 052 073	(105)	1B 2A 73 34 49	(69)
Flush All Pages	Flush All complete pages	E_C&r0F	(f)	027 038 114 048 070	(102)	1B 26 72 30 46	(66)
	Flush all page data	E_C&r1F	(f)	027 038 114 049 070	(102)	1B 26 72 31 46	(66)
Free Memory Space	Request free memory status	E_C*s1M	(m)	027 042 115 049 077	(109)	1B 2A 73 31 4D	(6D)
Echo	# = Echo value (-32767 to 32767)	E_C*s#X	(x)	027 042 115 #...# 088	(120)	1B 2A 73 #...# 58	(78)
				PROGRAMMING HINTS			
End-of-Line Wrap	Enabled	E_C&s0C	(c)	027 038 115 048 067	(99)	1B 26 73 30 43	(63)
	Disabled	E_C&s1C	(c)	027 038 115 049 067	(99)	1B 26 73 31 43	(63)
Display Functions	ON	E_CY		027 089		1B 59	
	OFF	E_CZ		027 090		1B 5A	

HP LaserJet Printer Commands—PCL (continued)

Function	Parameter	Command		Decimal Value		Hexadecimal Value	
		PCL Vector Graphics Switching/Set-Up Picture Frame					
Enter PCL Mode	Use previous PCL cursor position	E_C%ØA		027 037 048 65		1B 25 30 41	
	Use current HP-GL/2 pen position for cursor position	E_C%1A		027 037 049 65		1B 25 31 41	
Enter HP-GL/2 Mode	Use Previous HP-GL/2 pen position	E_C%ØB		027 037 048 066		1B 25 30 42	
	Use current PCL cursor position	E_C%1B		027 037 049 066		1B 25 31 42	
HP-GL/2 Plot Horizontal Size	Horizontal size in inches	E_C*c#K	(k)	027 042 099 #...# 075	(107)	1B 2A 63 # ... # 4B	(6B)
HP-GL/2 Plot Vertical Size	Vertical size in inches	E_C*c#L	(l)	027 042 099 #...# 076	(108)	1B 2A 63 #...# 4C	(6C)
Set Picture Frame Anchor Point	Set anchor point to cursor position	E_C*cØT	(t)	027 042 099 048 084	(116)	1B 2A 63 30 54	(74)
Picture Frame Horizontal Size	Decipoints	E_C*c#X	(x)	027 042 099 #...# 088	(120)	1B 2A 63 #...# 58	(78)
Picture Frame Vertical Size	Decipoints	E_C*c#Y	(y)	027 042 099 #...# 089	(121)	1B 2A 63 #...# 59	(79)

A

Printer
Commands

Table A-6

HP-GL/2 Context Printer Commands		
COMMAND	MNEMONIC	PARAMETERS*
DUAL CONTEXT EXTENSIONS		
ENTER PCL MODE	^{E}c%#A	0 Retain previous PCL cursor position 1 Use current HP-GL/2 pen position
RESET	^{E}cE	None
PRIMARY FONT	FI	Font_ID
SECONDARY FONT	FN	Font_ID
SCALABLE OR BITMAPPED FONTS	SB	0 - Scalable fonts only 1 - Bitmapped fonts allowed
PALETTE EXTENSIONS		
TRANSPARENCY MODE	TR	0 - Off (opaque) 1 - On (transparent)
SCREENED VECTORS	SV	[screen_type[,shading[,index]]]
VECTOR GROUP *Parameters in brackets are optional.		
ARC ABSOLUTE	AA	x_center,y_center,sweep_angle [,chord_angle];
ARC RELATIVE	AR	x_increment,y_increment,sweep_angle [,chord_angle];
ABSOLUTE ARC THREE POINT	AT	x_inter,y_inter,x_end,y_end [,chord_angle];
PLOT ABSOLUTE	PA	[x,y ... [,x,y]];
PLOT RELATIVE	PR	[x,y ... [,x,y]];
PEN DOWN	PD	[x,y ... [,x,y]];
PEN UP	PU	[x,y ... [,x,y]];
RELATIVE ARC THREE POINT	RT	x_incr_inter,y_incr_inter,x_incr_end, y_incr-end [,chord_angle];
POLYLINE ENCODED	PE	[flag[val]coord_pair ... [flag[val]coord_pair]];

HP-GL/2 Context Printer Commands (continued)		
COMMAND	MNEMONIC	PARAMETERS*
POLYGON GROUP *Parameters in brackets are optional.		
BEZIER ABSOLUTE	BZ	kind, x1_control_pt, y1_control_pt x2_control_pt, y2_control_pt x3_control_pt, y3_contorl_pt [,params … [,params]];
BEZIER RELATIVE	BR	kind, x1_control_pt_increments, y1_control_pt_increments, x2_control_pt_increments, y2_control_pt_increments, x3_control_pt_increments, y3_control_pt_increments, [,params … [,params]];
CIRCLE	CI	radius [,chord_angle];
FILL RECTANGLE ABSOLUTE	RA	x_coordinate,y_coordinate;
FILL RECTANGLE RELATIVE	RR	x_increment,y_increment;
EDGE RECTANGLE ABSOLUTE	EA	x_coordinate,y_coordinate;
EDGE RECTANGLE RELATIVE	ER	x_increment,y_increment;
FILL WEDGE	WG	radius,start_angle, sweep_angle [,chord_angle];
EDGE WEDGE	EW	radius,start_angle, sweep_angle[,chord_angle];
POLYGON MODE	PM	polygon_definition;
FILL POLYGON	FP	
EDGE POLYGON	EP	

A Printer Commands

HP-GL/2 Context Printer Commands (continued)		
COMMAND	MNEMONIC	PARAMETERS*
CHARACTER GROUP *Parameters in brackets are optional.		
SELECT STANDARD FONT	SS	None
SELECT ALTERNATE FONT	SA	None
ABSOLUTE DIRECTION	DI	[run,rise];
RELATIVE DIRECTION	DR	[run,rise];
ABSOLUTE CHARACTER SIZE	SI	[width,height];
RELATIVE CHARACTER SIZE	SR	[width,height];
CHARACTER SLANT	SL	[tangent_of_angle];
EXTRA SPACE	ES	[width[,height]]
STANDARD FONT DEFINITION	SD	[kind,value ... [,kind,value]];
ALTERNATE FONT DEFINITION	AD	[kind,value ... [,kind,value]];
CHARACTER FILL MODE	CF	[fill_mode[,edge_pen]];
LABEL ORIGIN	LO	[position];LABEL
LABEL	LB	[char ... [,char]]lbterm
DEFINE LABEL TERMINATOR	DT	[1bterm[,mode]];
CHARACTER PLOT	CP	[spaces,lines];
TRANSPARENT DATA	TD	[mode];
DEFINE VARIABLE TEXT PATH	DV	[path[,line]];
LINE AND FILL ATTIBUTES GROUP *Parameters in brackets are optional.		
LINE TYPE	LT	[line_type[,pattern_length[,mode]]];
LINE ATTRIBUTES	LA	[kind,value ... [,kind,value]];
PEN WIDTH	PW	[width[,pen]];
PEN WIDTH UNIT SELECTION	WU	[type];
SELECT PEN	SP	[pen]; *(required, 1 for black or 0 for white)*
SYMBOL MODE	SM	[char];
FILL TYPE	FT	[fill_type[,option1[,option2]]];
ANCHOR CORNER	AC	[x_coordinate,y_coordinate];
RASTER FILL DEFINITION	RF	[index[,width,height,pen_nbr ... pen_nbr]]; *(width and height must be less than 255)*
USER DEFINED LINE TYPE	UL	[index[,gap1 ... gapn]];

HP-GL/2 Context Printer Commands (continued)		
COMMAND	MNEMONIC	PARAMETERS*
CONFIGURATION AND STATUS GROUP *Parameters in brackets are optional.		
SCALE	SC	[x1,x2,y1,y2[,type[,left,bottom]]]; or [x1,xfactor,y1,yfactor,2];
INPUT WINDOW	IW	[xLL,yLL,xUR,yUR];
INPUT P1 AND P2	IP	[p1x,p1y[,p2x,p2y]];
INPUT RELATIVE P1 AND P2	IR	[p1x,p1y[,p2x,p2y]];
DEFAULT VALUES	DF	
INITIALIZE	IN	[n];
ROTATE COORDINATE SYSTEM	RO	[angle];

Table A-7

PJL Syntax Comparison	
Suggested Syntax Rules	
[ ]	Items in brackets "[. . .]" indicate optional parameters.
< >	Identifies a control code character
Special Identifiers	
<HT>	Horizontal tab character (ASCII 9).
<LF>	Line feed character (ASCII 10).
<CR>	Carriage return character (ASCII 13).
<SP>	Space character (ASCII 32).
<WS>	White space
<ESC>	Escape character (ASCII 27).
<FF>	Form feed character (ASCII 12).
<Words>	Printable characters (ASCII characters 33 through 126) and <WS>
PJL Commands	
COMMENT	@PJL COMMENT <Words> [<CR>] <LF>
DEFAULT	@PJL DEFAULT [LPARM: *personality*] *variable = value* [<CR>] <LF>
DINQUIRE	@PJL DINQUIRE [LPARM: *personality*] *variable* [<CR>] <LF>
Response	@PJL DINQUIRE [LPARM: *personality*] *variable* <CR> <LF> value <CR> <LF> <FF>
ECHO	@PJL ECHO [<Words>] [<CR>] <LF>
Response	@PJL ECHO [<Words>] <CR> <LF> <FF>

PJL Syntax Comparison (continued)	
PJL Commands (continued)	
ENTER	@PJL ENTER LANGUAGE = *personality* [<CR>] <LF⤶
EOJ	@PJL EOJ [NAME = *job name*] [<CR>] <LF>
INFO	@PJL INFO *read only variable* [<CR>] <LF>
Response	@PJL INFO *read only variable* <CR> <LF> [1 or more lines of printable characters or <WS> followed by <CR> <LF>]<FF>
INITIALIZE	@PJL INITIALIZE [<CR>] <LF>
INQUIRE	@PJL INQUIRE [LPARM: *personality*] *variable* [<CR>] <LF>
Response	@PJL INQUIRE [LPARM: *personality*] *variable* <CR> <LF> *value* <CR> <LF> <FF>
JOB	@PJL JOB [NAME = "*job name*"] [START
OPMSG	@PJL OPMSG DISPLAY = "*message*" [<CR>] <LF>,
RDYMSG	@PJL RDYMSG DISPLAY = "*message*" [<CR>] <LF>,
RESET	@PJL RESET [<CR>] <LF>
SET	@PJL SET [LPARM: *personality*] *variable* = *value* [<CR>] <LF>,
STMSG	@PJL STMSG DISPLAY = "*message*" [<CR>] <LF>,
Response	@PJL STMSG DISPLAY = "*message*" <CR> <LF>
UEL/SPJL	<ESC>%-12345X
USTATUS	@PJL USTATUS *variable* = *value* [<CR>] <LF>,
Response	@PJL USTATUS *variable* <CR> <LF> [1 or more lines of printable characters or <WS> followed by <CR> <LF>]<FF>,
USTATUSOFF	@PJL USTATUSOFF [<CR>] <LF>
PJL	@PJL [<CR>] <LF>

B

Symbol
Sets

Symbol Set Tables

Symbol sets are unique groupings of characters (alphabetic, numeric, punctuation, and special symbols) designed to meet the requirements of specific languages and occupations. To help you choose and use the proper symbol set, this appendix contains:

- Tables showing which symbol sets each of the printer's internal typefaces supports.
- Control panel display names and PCL language values for symbol sets.
- Individual symbol set tables showing character locations and ASCII character code positions.
- Substitution table for accessing ISO symbols from the Roman-8 symbol set.
- Special control codes to be used with symbol sets.
- Conversion tables for hexadecimal, decimal and octal characters.

Note   For PostScript symbol sets, see your software documentation. For general information on PostScript symbol sets, see Appendix G, "PostScript Information."

Shaded Areas in Tables

The gray shaded areas in these tables denote printer control code areas. Math composite characters are shown with light-colored shades, and line-draw composite characters are shown with dark-colored shades. Composite characters are made by combining individual character elements into a large character. See your computer or software documentation for information on printing the characters shown in the right half of the tables (code numbers 128-255).

The International Standards Organization (ISO) symbol sets and the HP German and HP Spanish symbol sets are represented by a character substitution table based on the Roman-8 symbol set.

Software Support

Although all the characters and symbols shown on these charts are printable, your software might not support some of them. Check your software documentation to see which symbol sets are supported. Look for phrases such as "code pages," "extended characters," and "character sets."

Typeface Support

Typefaces are designed to include limited combinations of characters and symbols. Some typefaces, such as WingDings, support only one specific symbol set. Other typefaces, such as CG Times and Univers, support almost all of the printer's available symbol sets.

Use Table B-1 and Table B-2 to determine which symbol sets to use with the typefaces you have chosen. These tables also contain information to help you select symbol sets using the printer's control panel or through your software application using PCL commands.

Note Other symbol sets are available with optional type products (such as ITC Zapf Dingbats).

B Symbol Sets

Table B-1

Control Panel Display	PCL Symbol Set ID	Typeface / Symbol Set	Albertus	Antique Olive	Clarend. Cond.	Coronet	Courier	Garmnd. Antiqua	Letter Gothic	Line Printer	Marigold	CG Omega	CG Times	Univers	Univers Cond.
ROMAN-8	8U	Roman-8	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO L1	0N	ISO 8859-1 Latin 1 (previously called ECMA 94 Latin 1)	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO L2	2N	ISO 8859-2 Latin 2					•		•				•	•	
ISO L5	5N	ISO 8859-9 Latin 5					•		•				•	•	
PC-8	10U	PC-8	•	•	•	•	•	•	•	•	•	•	•	•	•
PC-8 DN	11U	PC-8 D/N	•	•	•	•	•	•	•	•	•	•	•	•	•
PC-850	12U	PC-850	•	•	•	•	•	•	•	•	•	•	•	•	•
PC-852	17U	PC-852					•		•				•	•	
PC-8 TK	9T	PC-Turk					•		•				•	•	
WIN L1	19U	Windows 3.1 Latin 1 (Microsoft calls it ANSI)	•	•	•	•	•	•	•		•	•	•	•	•
WIN L2	9E	Windows 3.1 Latin 2					•		•				•	•	
WIN L5	5T	Windows 3.1 Latin 5					•		•				•	•	
DESKTOP	7J	DeskTop	•	•	•	•	•	•	•		•	•	•	•	•
PS TEXT	10J	PS Text	•	•	•	•	•	•	•		•	•	•	•	•
VN INTL	13J	Ventura International	•	•	•	•	•	•	•		•	•	•	•	•
VN US	14J	Ventura US	•	•	•	•	•	•	•		•	•	•	•	•
MS PUBL	6J	Microsoft Publishing	•	•	•	•	•	•	•		•	•	•	•	•
MATH-8	8M	Math-8					•		•				•	•	
PS MATH	5M	PS Math					•		•				•	•	
VN MATH	6M	Ventura Math					•		•				•	•	
PI FONT	15U	PI Font					•		•				•	•	
LEGAL	1U	Legal	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 4	1E	ISO United Kingdom *	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 6	0U	ASCII*	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 11	0S	ISO Swedish: names*	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 15	0I	ISO Italian*	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 17	2S	ISO Spanish*	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 21	1G	ISO German*	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 60	0D	ISO Norwegian*	•	•	•	•	•	•	•	•	•	•	•	•	•
ISO 69	1F	ISO French*	•	•	•	•	•	•	•	•	•	•	•	•	•
WIN 3.0	9U	Windows 3.0 Latin 1 (previously called Windows)	•	•	•	•	•	•	•		•	•	•	•	•
(not available through the control panel)	12J	MC Text	•	•	•	•	•	•	•		•	•	•	•	•
	19M	Symbol													
	579L	Wingdings													

*These symbol sets are variations of the Roman-8 symbol set.

Symbol Sets Supported by the Printer's Intellifont Typefaces

Table B-2

Control Panel Display	PCL Symbol Set ID	Typeface Symbol Set	Arial	Times New Roman	Wing- dings	Symbol
ROMAN-8	8U	Roman-8	•	•		
ISO L1	0N	ISO 8859-1 Latin 1 (previously called ECMA 94 Latin 1)	•	•		
ISO L2	2N	ISO 8859-2 Latin 2	•	•		
ISO L5	5N	ISO 8859-9 Latin 5	•	•		
PC-8	10U	PC-8	•	•		
PC-8 DN	11U	PC-8 D/N	•	•		
PC-850	12U	PC-850	•	•		
PC-852	17U	PC-852	•	•		
PC-8 TK	9T	PC-Turk	•	•		
WIN L1	19U	Windows 3.1 Latin 1 (Microsoft calls it ANSI)	•	•		
WIN L2	9E	Windows 3.1 Latin 2	•	•		
WIN L5	5T	Windows 3.1 Latin 5	•	•		
DESKTOP	7J	DeskTop	•	•		
PS TEXT	10J	PS Text	•	•		
VN INTL	13J	Ventura International	•	•		
VN US	14J	Ventura US	•	•		
MS PUBL	6J	Microsoft Publishing				
MATH-8	8M	Math-8				
PS MATH	5M	PS Math				
VN MATH	6M	Ventura Math				
PI FONT	15U	PI Font				
LEGAL	1U	Legal	•	•		
ISO 4	1E	ISO United Kingdom *	•	•		
ISO 6	0U	ASCII*	•	•		
ISO 11	0S	ISO Swedlish: names*	•	•		
ISO 15	0I	ISO Italian*	•	•		
ISO 17	2S	ISO Spanish*	•	•		
ISO 21	1G	ISO German*	•	•		
ISO 60	0D	ISO Norwegian*	•	•		
WIN 3.0	9U	Windows 3.0 Latin 1 (previously called Windows)	•	•		
(not available through the control panel)	12J	MC Text	•	•		
	19M	Symbol				•
	579L	Wingdings			•	

*These symbol sets are variations of the Roman-8 symbol set.

Symbol Sets Supported by the Printer's TrueType Typefaces

Symbol Sets

DeskTop (DT) 7J

Roman-8 (R8) 8U

Symbol Sets (continued)

(E1) ISO 8859/1 Latin 1 ON

19U Windows 3.1 Latin 1 (W1)

Symbol Sets (continued)

PC-850 Multilingual (PM) — 12U

PC-8 Code Page 437 (PC) — 10U

Symbol Sets (continued)

12J — MC Text (MC)

10J — PS Text (TS)

The MC Text symbol set can only be accessed through PCL language commands or application software. It is not selectable through the printer's control panel.

Symbol Sets (continued)

PC-8 Danish/Norwegian (PD) 11U

Ventura International (VI) 13J

Symbol Sets (continued)

1U   Legal   (LG)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	° 96	p 112			160	176	192	208	224	240
1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113			161	177	193	209	225	241
2	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114			162	178	194	210	226	242
3	ETX 3	DC3 19	# 35	3 51	C 67	S 83	c 99	s 115			163	179	195	211	227	243
4	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116			164	180	196	212	228	244
5	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117			165	181	197	213	229	245
6	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118			166	182	198	214	230	246
7	BEL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119			167	183	199	215	231	247
8	BS 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120			168	184	200	216	232	248
9	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121			169	185	201	217	233	249
A	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122			170	186	202	218	234	250
B	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	§ 123			171	187	203	219	235	251
C	FF 12	FS 28	, 44	= 60	L 76	® 92	l 108	¶ 124			172	188	204	220	236	252
D	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	† 125			173	189	205	221	237	253
E	SO 14	RS 30	. 46	¢ 62	N 78	© 94	n 110	™ 126			174	190	206	222	238	254
F	SI 15	US 31	/ 47	? 63	O 79	— 95	o 111	▨ 127			175	191	207	223	239	255

14J   Ventura US   (VU)

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL 0	DLE 16	SP 32	0 48	@ 64	P 80	` 96	p 112			' 160	‰ 176	192	208	224	240
1	SOH 1	DC1 17	! 33	1 49	A 65	Q 81	a 97	q 113			161	" 177	193	209	225	241
2	STX 2	DC2 18	" 34	2 50	B 66	R 82	b 98	r 114			162	" 178	194	210	226	242
3	ETX 3	DC3 19	# 35	3 51	C 67	S 83	c 99	s 115			163	° 179	195	211	227	243
4	EOT 4	DC4 20	$ 36	4 52	D 68	T 84	d 100	t 116			164	180	196	212	228	244
5	ENQ 5	NAK 21	% 37	5 53	E 69	U 85	e 101	u 117			165	181	197	213	229	245
6	ACK 6	SYN 22	& 38	6 54	F 70	V 86	f 102	v 118			166	182	198	214	230	246
7	BEL 7	ETB 23	' 39	7 55	G 71	W 87	g 103	w 119			© 167	183	199	215	231	247
8	BS 8	CAN 24	(40	8 56	H 72	X 88	h 104	x 120			® 168	184	200	216	232	248
9	HT 9	EM 25	) 41	9 57	I 73	Y 89	i 105	y 121			™ 169	185	201	217	233	249
A	LF 10	SUB 26	* 42	: 58	J 74	Z 90	j 106	z 122			170	186	202	218	234	250
B	VT 11	ESC 27	+ 43	; 59	K 75	[91	k 107	{ 123			171	187	203	219	235	• 251
C	FF 12	FS 28	, 44	< 60	L 76	/ 92	l 108		124			172	188	204	220	236	252
D	CR 13	GS 29	- 45	= 61	M 77	] 93	m 109	} 125			173	§ 189	205	221	237	253
E	SO 14	RS 30	. 46	> 62	N 78	^ 94	n 110	~ 126			174	¢ 190	206	222	238	254
F	SI 15	US 31	/ 47	? 63	O 79	_ 95	o 111	127			175	191	207	223	239	... 255

B   Symbol Sets

Symbol Sets (continued)

Microsoft Publishing (PB) — 6J

Windows 3.0 Latin 1 (WO) — 9U

Symbol Sets (continued)

9T PC-Turkish (PT)

17U PC-852 Latin 2 (PE)

Symbol Sets (continued)

Windows 3.1 Latin 2 (WE) — 9E

ISO 8859/2 Latin 2 (E2) — 2N

Symbol Sets (continued)

Windows 3.1 Latin 5 (WT) — 5T

ISO 8859/9 Latin 5 (E5) — 5N

Symbol Sets (continued)

Math-8 (M8) 8M

Ventura Math (VM) 6M

Symbol Sets (continued)

PS Math (MS) — 5M

Pi Font (PI) — 15U

B Symbol Sets

Symbol Sets (continued)

579L — Wingdings Font (L$)

19M — Symbol Font (AS)

ISO Substitution Table

This table provides a quick reference for the values of special characters contained in ISO (International Standards Organization) symbol sets. ISO symbol sets contain the same characters as the ASCII symbol set, except for the character positions listed in this table. For example, within the ISO 21 (German) symbol set, the "section" sign (§) replaces the @ sign used in decimal position 64 of the ASCII symbol set.

Figure B-1

ISO	Name	ID	Decimal Character Equivalents											
			35	36	64	91	92	93	94	96	123	124	125	126
6	ASCII	0U	#	$	@	[	\	]	^	`	{	|	}	~
4	United Kingdom	1E	£	$	@	[	\	]	^	`	{	|	}	−
69	French	1F	£	$	à	°	ç	§	^	µ	é	ù	è	¨
21	German	1G	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
15	Italian	0I	£	$	§	°	ç	é	^	ù	à	ò	è	ì
11	Swedish for Names	0S	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
17	Spanish	2S	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
60	Norwegian version 1	0D	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	−

Control Codes

Many symbol sets contain a PCL language command called a *control code*. A control code is a special non-printable mnemonic command that initiates a printer function. Definitions of a few of the widely used control codes are listed below. For more information, refer to the *PCL 5 Printer Language Technical Reference Manual*.

Backspace	B_S	Move one column left unless at left margin, in which case no action is taken	Shift In	S_I	Select characters that follow from the current primary font until receipt of a Shift Out.
Line Feed	L_F	Move to next print line while maintaining current column position.	Escape	E_C	Indicates the beginning of a special control sequence (escape sequence).
Form Feed	F_F	Move to first line at top of the next page while maintaining current column position.	Horizontal Tab	H_T	Move to next horizontal tab stop. The tab stops are at the left margin and every eight columns to the right of the left margin.
Carriage Return	C_R	Move to the left margin on the current print line.	Space	S_P	Move one column to the right unless already at the right margin
Shift Out	S_U	Select characters that follow from the current secondary font until receipt of a Shift In.			

Conversion Table

The following table gives the hexadecimal, decimal, and octal equivalent of each character in the Roman-8 symbol set. Use this table when your software requires you to enter hexadecimal, decimal, or octal values in place of printer command characters.

Table B-3   **Roman-8 Character Conversion**

Graphic	Hex	Dec	Oct	Description
	00	0	000	NUL (null)
	01	1	001	SOH (start of heading)
	02	2	002	STX (start of text)
	03	3	003	ETX (end of text)
	04	4	004	EOT (end of transmission)
	05	5	005	ENQ (enquiry)
	06	6	006	ACK (acknowledge)
	07	7	007	BEL (bell)
	08	8	010	BS (backspace)
	09	9	011	HT (horizontal tabulation)
	0A	10	012	LF (line feed)
	0B	11	013	VT (vertical tabulation)
	0C	12	014	FF (form feed)
	0D	13	015	CR (carriage return)
	0E	14	016	SO (shift out)
	0F	15	017	SI (shift in)
	10	16	020	DLE (data link escape)
	11	17	021	DC1 (device control 1 or X-ON)
	12	18	022	DC2 (device control 2)
	13	19	023	DC3 (device control 3 or X-OFF)
	14	20	024	DC4 (device control 4)
	15	21	025	NAK (negative acknowledge)
	16	22	026	SYN (synchronous idle)
	17	23	027	ETB (end of transmission block)
	18	24	030	CAN (cancel)
	19	25	031	EM (end of medium)
	1A	26	032	SUB (substitute)
	1B	27	033	ESC (escape)
	1C	28	034	FS (file separator)
	1D	29	035	GS (group separator)
	1E	30	036	RS (record separator)
	1F	31	037	US (unit separator)
	20	32	040	SP (space)
!	21	33	041	Exclamation point
"	22	34	042	Quotation mark
#	23	35	043	Number sign
$	24	36	044	Dollar sign
%	25	37	045	Percent sign
&	26	38	046	Ampersand
'	27	39	047	Closing single quote (apostrophe)

Table B-2 (cont)   **Roman-8 Character Conversion (continued)**

Graphic	Hex	Dec	Oct	Description
(	28	40	050	Opening parenthesis
)	29	41	051	Closing parenthesis
*	2A	42	052	Asterisk
+	2B	43	053	Plus
,	2C	44	054	Comma
-	2D	45	055	Hyphen
.	2E	46	056	Period (point)
/	2F	47	057	Slant (solidus)
0	30	48	060	Zero
1	31	49	061	One
2	32	50	062	Two
3	33	51	063	Three
4	34	52	064	Four
5	35	53	065	Five
6	36	54	066	Six
7	37	55	067	Seven
8	38	56	070	Eight
9	39	57	071	Nine
:	3A	58	072	Colon
;	3B	59	073	Semicolon
<	3C	60	074	Less than sign
=	3D	61	075	Equals sign
>	3E	62	076	Greater than sign
?	3F	63	077	Question mark
@	40	64	100	Commercial At
A	41	65	101	Uppercase A
B	42	66	102	Uppercase B
C	43	67	103	Uppercase C
D	44	68	104	Uppercase D
E	45	69	105	Uppercase E
F	46	70	106	Uppercase F
G	47	71	107	Uppercase G
H	48	72	110	Uppercase H
I	49	73	111	Uppercase I
J	4A	74	112	Uppercase J
K	4B	75	113	Uppercase K
L	4C	76	114	Uppercase L
M	4D	77	115	Uppercase M
N	4E	78	116	Uppercase N
O	4F	79	117	Uppercase O

Table B-2 (cont)   **Roman-8 Character Conversion (continued)**

Graphic	Hex	Dec	Oct	Description
P	50	80	120	Uppercase P
Q	51	81	121	Uppercase Q
R	52	82	122	Uppercase R
S	53	83	123	Uppercase S
T	54	84	124	Uppercase T
U	55	85	125	Uppercase U
V	56	86	126	Uppercase V
W	57	87	127	Uppercase W
X	58	88	130	Uppercase X
Y	59	89	131	Uppercase Y
Z	5A	90	132	Uppercase Z
[	5B	91	133	Opening square bracket
\	5C	92	134	Reverse slant
]	5D	93	135	Closing bracket
^	5E	94	136	Caret (circumflex)
_	5F	95	137	Underscore (low line)
`	60	96	140	Opening Single Quote
a	61	97	141	Lowercase a
b	62	98	142	Lowercase b
c	63	99	143	Lowercase c
d	64	100	144	Lowercase d
e	65	101	145	Lowercase e
f	66	102	146	Lowercase f
g	67	103	147	Lowercase g
h	68	104	150	Lowercase h
i	69	105	151	Lowercase i
j	6A	106	152	Lowercase j
k	6B	107	153	Lowercase k
l	6C	108	154	Lowercase l
m	6D	109	155	Lowercase m
n	6E	110	156	Lowercase n
o	6F	111	157	Lowercase o
p	70	112	160	Lowercase p
q	71	113	161	Lowercase q
r	72	114	162	Lowercase r
s	73	115	163	Lowercase s
t	74	116	164	Lowercase t
u	75	117	165	Lowercase u
v	76	118	166	Lowercase v
w	77	119	167	Lowercase w

Table B-2 (cont)   **Roman-8 Character Conversion (continued)**

Graphic	Hex	Dec	Oct	Description
x	78	120	170	Lowercase x
y	79	121	171	Lowercase y
z	7A	122	172	Lowercase z
{	7B	123	173	Opening brace (curly bracket)
|	7C	124	174	Vertical line
}	7D	125	175	Closing brace (curly bracket)
~	7E	126	176	Approximate (tilde)
▒	7F	127	177	DEL (delete, rubout)
	80	128	200	--undefined control code--
	81	129	201	--undefined control code--
	82	130	202	--undefined control code--
	83	131	203	--undefined control code--
	84	132	204	--undefined control code--
	85	133	205	--undefined control code--
	86	134	206	--undefined control code--
	87	135	207	--undefined control code--
	88	136	210	--undefined control code--
	89	137	211	--undefined control code--
	8A	138	212	--undefined control code--
	8B	139	213	--undefined control code--
	8C	140	214	--undefined control code--
	8D	141	215	--undefined control code--
	8E	142	216	--undefined control code--
	8F	143	217	--undefined control code--
	90	144	220	--undefined control code--
	91	145	221	--undefined control code--
	92	146	222	--undefined control code--
	93	147	223	--undefined control code--
	94	148	224	--undefined control code--
	95	149	225	--undefined control code--
	96	150	226	--undefined control code--
	97	151	227	--undefined control code--
	98	152	230	--undefined control code--
	99	153	231	--undefined control code--
	9A	154	232	--undefined control code--
	9B	155	233	--undefined control code--
	9C	156	234	--undefined control code--
	9D	157	235	--undefined control code--
	9E	158	236	--undefined control code--
	9F	159	237	--undefined control code--

Table B-2 (cont)   **Roman-8 Character Conversion (continued)**

Graphic	Hex	Dec	Oct	Description
	A0	160	240	NBS (No Break Space)
À	A1	161	241	Uppercase A grave
Â	A2	162	242	Uppercase A circumflex
È	A3	163	243	Uppercase E grave
Ê	A4	164	244	Uppercase E circumflex
Ë	A5	165	245	Uppercase E dieresis
Î	A6	166	246	Uppercase I circumflex
Ï	A7	167	247	Uppercase I dieresis
´	A8	168	250	Lowercase acute accent
`	A9	169	251	Lowercase grave accent
^	AA	170	252	Lowercase circumflex accent
¨	AB	171	253	Lowercase dieresis accent
~	AC	172	254	Lowercase tilde accent
Ù	AD	173	255	Uppercase U grave
Û	AE	174	256	Uppercase U circumflex
£	AF	175	257	Italian lira (pound sterling)
‾	B0	176	260	Overscore (high line)
Ý	B1	177	261	Uppercase Y acute
ý	B2	178	262	Lowercase y acute
°	B3	179	263	Degree
Ç	B4	180	264	Uppercase C cedilla
ç	B5	181	265	Lowercase c cedilla
Ñ	B6	182	266	Uppercase N tilde
ñ	B7	183	267	Lowercase n tilde
¡	B8	184	270	Inverted exlamation mark
¿	B9	185	271	Inverted question mark
¤	BA	186	272	General currency symbol
£	BB	187	273	Pound sterling sign
¥	BC	188	274	Yen sign
§	BD	189	275	Section mark
ƒ	BE	190	276	Dutch guilder symbol
¢	BF	191	277	Cent sign
â	C0	192	300	Lowercase a circumflex
ê	C1	193	301	Lowercase e circumflex
ô	C2	194	302	Lowercase o circumflex
û	C3	195	303	Lowercase u circumflex
á	C4	196	304	Lowercase a acute
é	C5	197	305	Lowercase e acute
ó	C6	198	306	Lowercase o acute
ú	C7	199	307	Lowercase u acute

Table B-2 (cont)   Roman-8 Character Conversion (continued)

Graphic	Hex	Dec	Oct	Description
à	C8	200	310	Lowercase a grave
è	C9	201	311	Lowercase e grave
ò	CA	202	312	Lowercase o grave
ù	CB	203	313	Lowercase u grave
ä	CC	204	314	Lowercase a dieresis
ë	CD	205	315	Lowercase e dieresis
ö	CE	206	316	Lowercase o dieresis
ü	CF	207	317	Lowercase u dieresis
Å	D0	208	320	Uppercase A bolle
î	D1	209	321	Lowercase i circumflex
Ø	D2	210	322	Uppercase O oblique
Æ	D3	211	323	Uppercase AE diphthong
å	D4	212	324	Lowercase a bolle
í	D5	213	325	Lowercase i acute
ø	D6	214	326	Lowercase o oblique
æ	D7	215	327	Lowercase ae diphthong
Ä	D8	216	330	Uppercase A dieresis
ì	D9	217	331	Lowercase i grave
Ö	DA	218	332	Uppercase O dieresis
Ü	DB	219	333	Uppercase U dieresis
É	DC	220	334	Uppercase E acute
ï	DD	221	335	Lowercase i dieresis
ß	DE	222	336	Lowercase es-zet ligature
Ô	DF	223	337	Uppercase O circumflex
Á	E0	224	340	Uppercase A acute
Ã	E1	225	341	Uppercase A tilde
ã	E2	226	342	Lowercase a tilde
Ð	E3	227	343	Uppercase Eth
ð	E4	228	344	Lowercase eth Icelandic
Í	E5	229	345	Uppercase I acute
Ì	E6	230	346	Uppercase I grave
Ó	E7	231	347	Uppercase O acute
Ò	E8	232	350	Uppercase O grave
Õ	E9	233	351	Uppercase O tilde
õ	EA	234	352	Lowercase o tilde
Š	EB	235	353	Uppercase S hacek
š	EC	236	354	Lowercase s hacek
Ú	ED	237	355	Uppercase U acute
Ÿ	EE	238	356	Uppercase Y dieresis
ÿ	EF	239	357	Lowercase y dieresis

Table B-2 (cont)   **Roman-8 Character Conversion (continued)**

Graphic	Hex	Dec	Oct	Description
þ	F0	240	360	Uppercase Thorn
þ	F1	241	361	Lowercase thorn
·	F2	242	362	Middle Dot
μ	F3	243	363	Lowercase mu (micro)
¶	F4	244	364	Pilcrow (paragraph sign)
¾	F5	245	365	Vulgar fraction: three fourths
—	F6	246	366	Minus sign
¼	F7	247	367	Vulgar fraction: one fourth
½	F8	248	370	Vulgar fraction: one half
ª	F9	249	371	Female ordinal
º	FA	250	372	Male ordinal
«	FB	251	373	Left pointing guillemets (quotes)
■	FC	252	374	Medium solid box
»	FD	253	375	Right pointing guillemets (quotes)
±	FE	254	376	Plus over minus
	FF	255	377	--undefined--

B-28

C

Environmental
Specifications

Location Requirements

The HP LaserJet 4Si printer should be located in a well ventilated room. The environment should be stable, with no abrupt changes in temperature or humidity. Place the printer on a sturdy, level surface. Figure C-1 shows the recommended clearance for the printer when the rear output try is extended:

Figure C-1
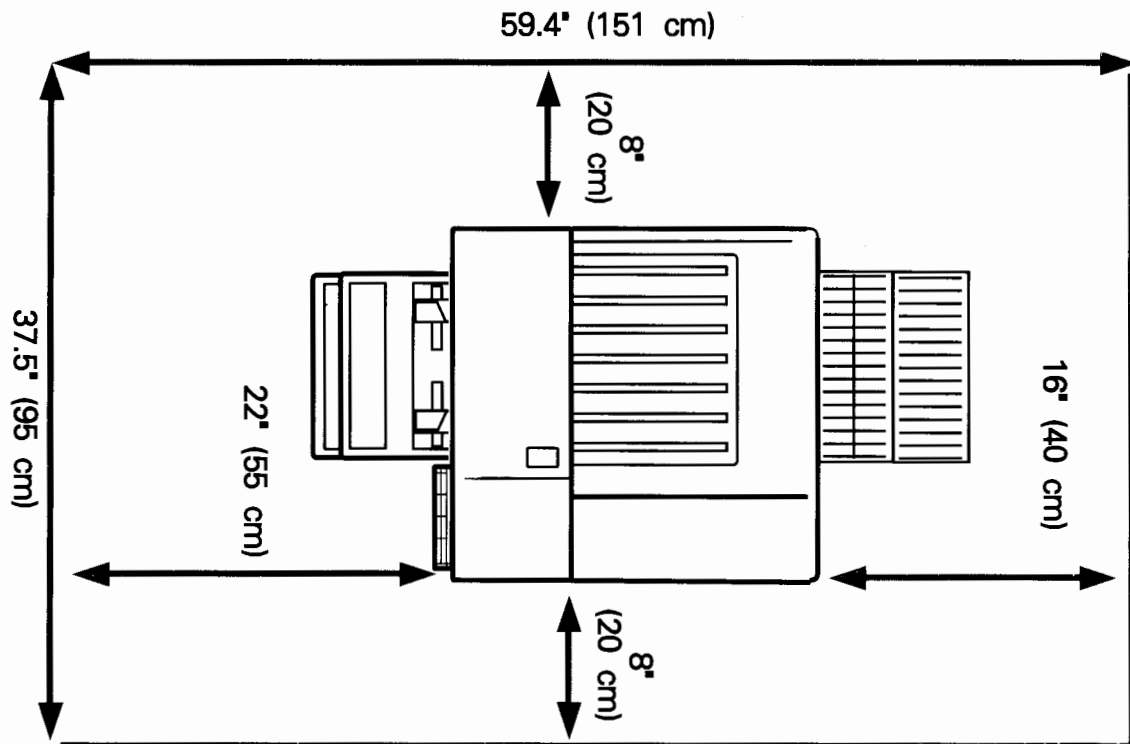
Printer Clearance Dimensions

C Environmental Specifications

Physical Dimensions

Height	16.5 in. (418 mm)
Width	21.5 in. (545 mm)
Depth (body)	23.6 in. (603 mm)
Depth (letter trays installed)	30.0 in. (763 mm)
Depth (legal trays installed)	31.6 in. (807 mm)
Weight (including loaded letter trays and toner cartridge)	123 lbs. (55.9 kg)

Electrical Requirements

Source	100 to 115 volts (±10%)	220 to 240 volts (±10%)
Frequency	50 - 60 Hz	50 Hz
Power Consumption		
Printing	1100 watts maximum	1100 watts maximum
Standby	240 watts (typical)	240 watts (typical)
Amperage		
Printing	9.4 amperes	4.5 amperes
Standby	2 amperes	1 amperes

Temperature (Printer and Toner Cartridge):
   Operating: 50 to 91° F (10 to 32.5° C)
   Storage: 32 to 95° F (0 to 35° C)

Humidity:
   Operating: 20 to 80% Relative Humidity
   Storage: 10 to 80% Relative Humidity

FCC Regulations

This equipment has been tested and found to comply within the limits for a Class A digital device pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate this equipment.

Note   Use of a shielded interface cable is required to comply within the Class A limits in part 15 of the FCC rules.

This product also meets Class B emission standards.

Safety Information

Laser Safety

This printer is certified as a Class 1 laser product under the U. S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the *Radiation Control for Health and Safety Act* of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

CDRH Regulations

The Center of Devices and Radiological Health (CDRH) of the U. S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The label shown in Figure C-2 indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

Figure C-2
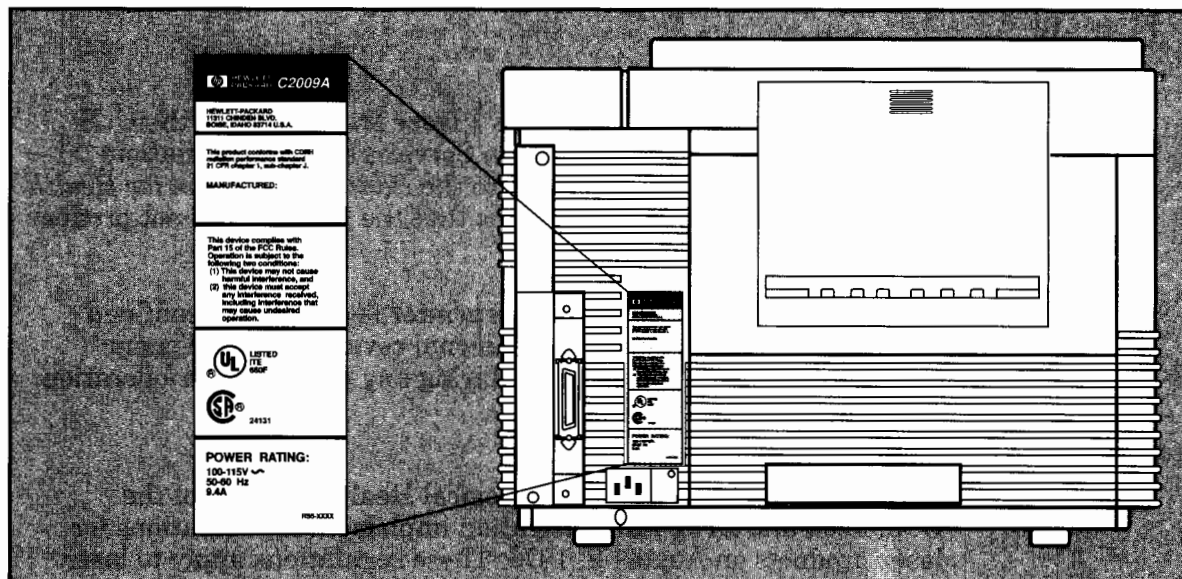
Safety Label Location

WARNING | Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Ozone Emission

The corona assemblies found in some other LaserJet printers generate ozone gas (O_3) as a by-product of the electrophotographic process. Ozone is only generated while the printer is printing (while the coronas are energized).

The HP LaserJet 4Si printer does not use corona wires in its print process, and therefore does not emit ozone.

VCCI Statement (Japan)

The VCCI statement (see below) is required in Japan. It is similar to the FCC regulations.

This equipment is classified in the 1st Class category. When used in a residential area or an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.	この装置は，商工業地域で使用されるべき第一種情報装置です。住宅地域又はその隣接した地域で使用するとラジオ，テレビジョン受信機等に受信障害を与えることがあります。VCCI-1

Laser Statement for Finland

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP LaserJet 4Si laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle.

Kirjoittimen on hyväksynyt Suomessa laserturvallisuuden osalta Työsuojeluhallitus. Laitteen turvallisuusluokka on määritetty valtioneuvoston päätöksen N:o 472/1985 ja standardin EN 60825 (1991) mukaisesti.

VAROITUS !

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING !

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

HUOLTO

HP LaserJet 4Si -kirjoittimen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Tällaiseksi huoltotoimenpiteeksi ei katsota väriainekasetin vaihtamista, paperiradan puhdistusta tai muita käyttäjän käsikirjassa lueteltuja, käyttäjän tehtäväksi tarkoitettuja ylläpitotoimia, jotka voidaan suorittaa ilman erikoistyökaluja.

VARO !

Mikäli kirjoittimen suojakotelo avataan, olet alttiina näkymättömälle lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

VARNING !

Om laserprinterns skyddshölje öppnas då apparaten är i funktion, utsättas användaren för osynlig laserstrålning. Betrakta ej strålen.

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

> Aallonpituus 777-795 nm
> Teho 5 mW
> Luokan 3B laser

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 11311 Chinden Boulevard
                                  Boise, Idaho 83714-1021
                                  U.S.A.

declares, that the product:

Product name: LaserJet 4Si

Model Number(s):   C2009A

conforms to the following Product Specifications:

Safety: IEC 950 / EN 60950
                                  IEC 825 laser class 1

EMC: EN 55022 class B / CISPR-22 class B /
                                  prEN 55101-2 / IEC 801-2 3kV CD,
                                  8 kV AD
                                  prEN 55101-3 / IEC 801-3 3 V/m

Supplementary Information: None

Boise, Idaho U.S.A. , Office of Quality Manager
September 11, 1992

D

Printer
Interfaces

Introduction

This appendix provides information about connecting your printer to your computer. Your printer supports printing from a Bi-Tronics parallel interface. In addition, your printer is equipped with a modular I/O slot which supports alternative interface options.

This appendix contains the following information:

- Configuring Your Printer

- Switchbox Operation

- Parallel Configuration
  - DOS Commands for Parallel Configuration
  - Parallel Cable Pinouts

- Modular I/O Configuration

Configuring Your Printer

Follow these steps to print on your HP LaserJet printer:

1 Attach the correct cable between the computer and the printer.
2 Configure your printer's control panel for the correct printer-interface option.
3 Configure your computer to send printer information to the correct printer port, if necessary.

Caution   *Proper Grounding:* Ensure that all interface cables and host computers attached to the printer follow proper grounding methods for electronic equipment in accordance with local electrical codes.

Switchbox Operation

If you are sharing your printer through an electronic or mechanical switchbox, you may experience some difficulty under certain conditions, particularly with mechanical switchboxes. The status readback feature of the HP LaserJet 4Si printer will probably not work with most printer sharing devices designed for previous LaserJet products, although printing will not be affected. New sharing devices are available which fully support the HP LaserJet 4Si.

If you are using a mechanical switchbox:

- Do not switch when the HP LaserJet 4Si is printing or receiving data (i.e., when the Ready light is blinking).
- Do not switch to a host computer that is OFF, then switch that computer ON. The computer can appear to be sending data. If a 22 ERROR message appears, reset the printer.

Parallel Configuration

If your printer does not have a network interface card, use the standard Bi-Tronics parallel interface. The parallel interface will still transmit data to the printer quickly; however, it is not as fast as a network interface, and the cable between the printer and the host system (for example, a PC or workstation) cannot be more than ten feet.

Note

- *Bi-Tronics parallel* is compatible with Centronics parallel. Although it uses the same cable, hardware, and software as Centronics parallel, to receive its enhanced capabilities   such as bi-directional communication between the computer and printer, faster transmission of data, and autoconfiguration of printer drivers   you need software that supports these features. Check with your software vendor to see if your software supports Bi-Tronics parallel features.
- *Automatic I/O switching* can be adjusted for maximum performance by using the timeout feature. If, when using multiple ports, data from other ports appears in the middle of your print job, increase the timeout value. See Timeout under the Job Menu in Chapter 2, "Printer Control Panel."

For specific information about setting up your computer and printer to print through the parallel interface, see the instructions in *Your Guide to Setting Up Your HP LaserJet 4Si Printer*.

Parallel DOS Commands

Most IBM PC and AT compatible computers default to a parallel printer port. To ensure that information is sent to your parallel printer port, type the following MS-DOS command at your MS-DOS prompt or include it in your AUTOEXEC.BAT file:

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

For MS-DOS version 4.0 and above, enter:

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

Note

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

Parallel Cable Pinouts

If you are using a computer with a Bi-Tronics parallel port, use the HP 2912A (9ft-9in/3 meters) cable or equivalent.

Signal Name	Printer Pin #	IBM Port Pin #
nSTROBE	1	1
DATA 1	2	2
DATA 2	3	3
DATA 3	4	4
DATA 4	5	5
DATA 5	6	6
DATA 6	7	7
DATA 7	8	8
DATA 8	9	9
nACKNLG	10	10
BUSY	11	11
CALL (PE)	12	12
SELECT	13	13
nAutoFd	14	14
O VDC (GND)	19 THRU 30	18 THRU 25
nFAULT	32	15
nSelIn	36	17

2912A Cable Pinout

Modular I/O Configuration

The HP LaserJet 4Si printer is equipped with two modular I/O slots. You can plug a modular I/O interface card into either slot or both slots (see Table D-1) to increase the number of interfaces available to you. Some cards may need to be configured from the printer control panel's MIO MENU 1 or MIO MENU 2 menu, which will appear after the cards are installed (refer to the docu- mentation that comes with your modular I/O card).

A modular I/O card can also provide increased printer performance when printing from a network. In addition, a modular I/O card provides the ability to place the printer anywhere on the network. This eliminates the need to attach the printer directly to a server or a workstation, and enables you to place your LaserJet 4Si or 4Si MX printer closer to your network users.

Note

When you install a MIO card, you may need to perform a cold reset to reinitialize the printer's control panel (see 08 COLD RESET in Chapter 7, "Troubleshooting"). A cold reset returns all Printing, PCL, PS, Job, Config, Mem Config, Parallel, and MIO Menu settings to their factory default configuration.

Available Modular I/O Interfaces

A number of modular I/O cards, called HP JetDirect interface cards, are available from Hewlett-Packard Company. HP offers JetDirect interface cards for networks like Ethernet, EtherTalk, LocalTalk, Token Ring, and UNIX in various network operating systems. For more information on types of interfaces and network operating systems that are supported by JetDirect interface cards, contact your authorized Hewlett-Packard dealer.

Table D-1

LaserJet 4Si/4Si MX Supported MIO Card Configurations			
UPPER MIO SLOT[1]			
Printer Model	Description	New P/N	Exchange P/N
LaserJet 4Si MX	Ethernet [10Base-T, 10Base2]	Standard	J2372-69001
LaserJet 4Si	Ethernet [10Base-T only]	J2371A	J2371-69001
	Ethernet [10Base-T, 10Base2]	J2372A	J2372-69001
	Token Ring	J2373A	J2373-69001
LOWER MIO SLOT[2]			
Printer Model	Description	New P/N	Exchange P/N
LaserJet 4Si MX	LocalTalk	Standard	J2381-69001
LaserJet 4Si	Ethernet [10Base-T only]	J2371A	J2371-69001
	Ethernet [10Base-T, 10Base2]	J2372A	J2372-69001
	Token Ring	J2373A	J2373-69001
	LocalTalk	J2341B	J2341-69001

1 The three HP MIO cards listed for the upper MIO slot (J2371A, J2372A, J2373A) are the only supported MIO
  cards for the upper slot.
2 If you have only one MIO card, it must be installed in the lower slot.

Caution

Any MIO card installed in the upper MIO slot must have the
faceplate from the LaserJet 4Si or an exchange faceplate (see Table
D-1) installed. Follow the installation instructions sent with each
MIO card carefully. Failure to follow these instructions can damage
both the MIO card and the LaserJet 4Si printer.

E

Media
Specifications

Introduction

You can use a variety of paper and other print media successfully with the printer using the guidelines in this appendix. Media that does not meet these guidelines may increase the incidence of paper jams, cause premature wear to the printer, and contribute to repair costs.

Before purchasing any media or specialized forms in quantity, make sure your paper supplier obtains and understands the paper and print media requirements specified in the *HP LaserJet Printer Family Paper Specification Guide* (HP part number 5002-1801).

Note   It is possible that paper could meet all of the guidelines in this appendix and still not print satisfactorily. This may be due to improper handling, unacceptable temperature and humidity levels of the room, or other variables over which Hewlett-Packard has no control.

We recommend testing any paper before buying large quantities.

CAUTION   Using media outside these specifications may cause problems requiring service. This service is not covered by the Hewlett-Packard warranty or service agreements.

Paper and Preprinted Forms

For best results, use conventional white photocopy paper for most of your print jobs (such as Xerox 4024 or Canon NP paper). Make sure the paper is good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, and curled or bent edges.

Colored Paper with Heat Resistant Pigments

Use colored paper of the same high quality as white photocopy paper. Pigments used must withstand the printer's fusing temperatures of 392°F / 200°C for 0.1 second without deterioration. Do not use paper with a colored coating that was added after the paper was produced.

Heavy Paper Stock

See the specific requirements given in Chapter 3, "Paper Handling and Printing," for each paper tray. *Do not* use paper heavier than 36 pound from the upper tray or 28 pound from the lower tray; misfeeds, stacking problems, paper jams, poor toner fusing, poor print quality, and excessive mechanical wear can result.

Forms Preprinted with Heat-Resistant Ink

Observe the following guidelines to avoid problems with preprinted forms.

- Forms must be printed with heat-resistant inks that will not melt, vaporize, or release hazardous emissions when subject to the printer's approximately 392°F / 200°C fusing temperature for 0.1 second.
- The inks must be nonflammable and should not adversely affect any printer rollers.
- Use forms sealed in a moisture-proof wrapping to prevent moisture changes during storage.

Papers to Avoid

To avoid poor print quality or damage to your printer, do not use:

- Paper that is too rough or too smooth, or contains embossed letterheads.
- Paper with cutouts or perforations.
- Letterhead papers that are printed with low temperature inks, such as those produced by some types of thermography.
- Papers that are coated and have a glossy finish. The coating can contaminate the fuser roller and damage the fuser assembly.

Adhesive Labels

Use only labels recommended for use in laser printers. To purchase labels, consult your HP authorized dealer or see the inside front cover of this manual for more information.

Label Construction

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at the 392°F (200°C) temperatures encountered in the printer's fusing process. None of the adhesive should be exposed between the labels.
- **Label arrangement:** If possible, use labels with no exposed areas between labels. If labels with exposed areas *are* used, arranged them on the carrier sheet (the backing) so that they cover the entire page *with the exposed areas of the carrier sheet running lengthwise down the sheet.* Using label stock with spaces between labels often results in labels peeling off during the printing cycle, causing serious jamming problems.
- **Label curl:** Labels must lie flat with no more than 0.5in/13mm of curl in any direction.
- **Poorly manufactured labels:** Do not use labels with wrinkles, bubbles, or other indications of delamination.

Overhead Transparencies

Overhead transparencies used in HP LaserJet printers must be able to withstand the 392°F (200°C) temperature encountered in the printer's fusing process. See Chapter 3, "Paper Handling and Printing" for specific printing and other characteristics.

CAUTION   Use only overhead transparencies recommended for use in laser printers.

Ordering Transparency Film

To purchase transparency film, consult your HP authorized dealer or see the inside front cover of this manual for more information.

Envelopes

You can print many types of envelopes with your printer. Some envelope styles perform better than others because their construction is better suited to feeding through a laser printer.

Note   Hewlett-Packard Company neither warrants nor recommends the use of a particular brand of envelope. Envelope properties are subject to change by envelope manufacturers, and Hewlett-Packard Company has no control over such changes.

Envelope Construction

- **Weight:** The weight of the envelope paper should not exceed a 24 pound / 90 grams/m^2 rating or jamming may result.
- **Construction:** Make sure envelopes lie flat with less than 0.25in/6mm of curl.
- **Manufacture:** Make sure envelopes are not wrinkled, nicked, or otherwise damaged.
- **Sizes:** Use only envelopes within the following sizes:

Minimum: 3.82 × 7.43 inches (90 mm × 160 mm)

Maximum: 6.28 × 9.4 inches (176 mm × 250 mm)

Business Envelopes

Commercial #10 or *Official* (also called Business or Regular) envelopes with diagonal seams and standard gummed flaps are the most widely used type of envelope. This style performed best in Hewlett-Packard testing.

Double Side Seam Envelopes

Double side seam construction has vertical seams at both ends of the envelope rather than diagonal seams. This style generally performed adequately in Hewlett-Packard testing.

Envelopes with Adhesive Strips or Flaps

Envelopes with a peel-off adhesive strip or with more than one flap that folds over to seal must use adhesives compatible with the heat and pressure of the fusing rollers in the printer. The extra flaps and strips may result in wrinkling or creasing, and may cause jamming.

CAUTION

Envelopes to Avoid: Do not use envelopes with clasps, snaps, windows (including those with plastic covers), or synthetic materials. These items can damage the printer.

F

SIMM Board
Installation

Installation Instructions

The HP LaserJet 4Si printer has four SIMM (Single In-line Memory Module) board slots. They can be used either for installing the Adobe PostScript language SIMM board or additional printer memory. The procedure is the same for installing either type of board.

Note

Use *only* HP memory SIMMs designed for HP LaserJet printers. The Adobe PostScript SIMM board is designed for use only with the HP LaserJet 4Si printer.

Printer Memory Verification

If you are installing a PostScript SIMM board, you must first know the amount of memory already installed in your printer. Use the procedure described on pages 2-39 and 2-40 to print and examine the self-test page, which shows how much memory your particular printer has (see Figure F-1).

The standard HP LaserJet 4Si printer comes with 2 megabytes of memory. Additional memory can be installed in one, two, four, or eight megabyte increments (larger increments may be available in the future). See Table F-1 for the amount of memory required for PostScript printing needs. (See Table 2-1 on page 2-8 for more detailed memory requirements.)

Table F-1   Minimum Memory Requirements for PostScript

Printing Need	Without Resource Saving		With Resource Saving	
	300 dpi	600 dpi	300 dpi	600 dpi
Simplex	2 MBytes	6 MBytes	10 MBytes	10 MBytes
Duplex	4 MBytes	10 MBytes	14 MBytes	14 MBytes

Figure F-1

Self Test Page

Overview of Board Installation

Follow these instructions to install and troubleshoot the PostScript or memory SIMM board. Install the PostScript board in the lowest slot before any memory boards are installed. If memory boards have been installed, remove them (see the section, "Removing a SIMM Board," later in this appendix) and reinstall them in the same order after the PostScript board has been installed in the lowest available slot.

Protect the Board

The SIMM board can be easily damaged by small amounts of static electricity. When handling the board:

- Wear an antistatic wrist strap *or* touch the surface of the antistatic package before removing the board from its package. When handling the board, frequently touch bare metal on the printer or the antistatic bag.

- Avoid moving about the work area to prevent static electricity.

- Handle the board carefully at all times. Avoid flexing the board or touching its components.

·

Board Installation

The following section describes procedures to remove the printer's side panel and small metal cover plate, insert a SIMM, and replace the metal cover plate and panel. You will need a Phillips #2 screwdriver.

Before you begin, read through all the instructions carefully to make sure you understand the procedures.

Remember, if you are installing both PostScript and memory SIMMs, the PostScript board should be installed first and should be placed in the lowest available slot.

WARNING   Hazardous voltages are present in the printer. Never remove any access cover or work near exposed electrical parts while the power cord is connected.

Follow these steps when installing SIMM boards:

1 Switch the printer OFF and UNPLUG THE POWER CORD.

WARNING   The printer weighs approximately 110 pounds. We recommend using two people to lift and position it for this installation.

2 Position the printer so the right side panel faces you. (From the front of the printer, the right side is to the right of the printer's control panel.)

3 Position yourself directly in front of the right side panel. (Because of the location of the SIMM board slots, it is easier to access them while seated.)

4 Use a Phillips #2 screwdriver to remove the two screws at the bottom of the side panel (see Figure F-2).

Figure F-2
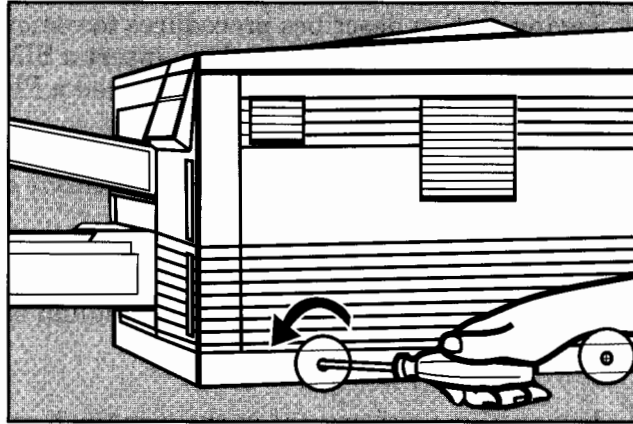
Removing Side Panel Screws

5 Remove the plastic side panel by sliding it to the right (see Figure F-3).

Figure F-3
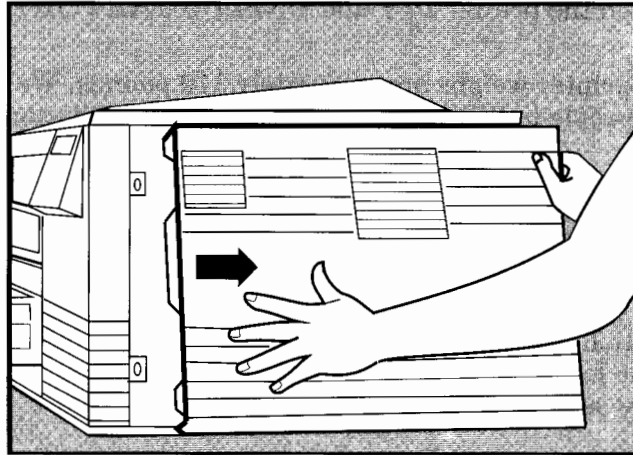
Removing the Side Panel

6 Because static discharge can damage the SIMM board, attach the antistatic wrist strap to the metal cover plate (see Figure F-4).

7 Unscrew the 4 screws from the metal plate and remove it (see Figure F-4).

Figure F-4
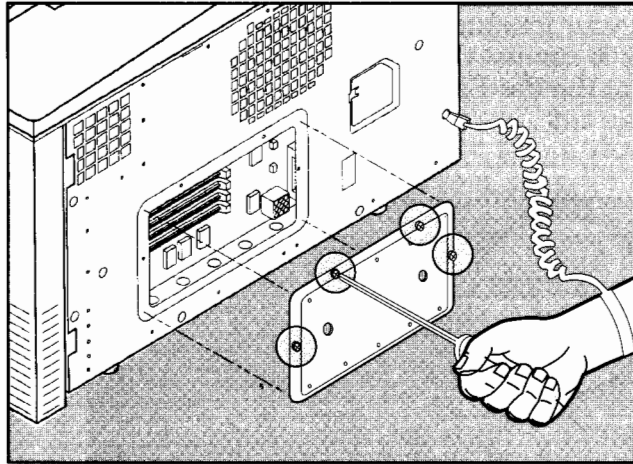
Removing the Metal Plate Covering SIMM Slots

8 Through the open panel, you can see the four SIMM board slots (see Figure F-4). Remove any SIMM memory boards, if necessary (see the "Removing a SIMM Board" section which follows).

9 When inserting boards, position them from the lowest available slot to the highest slot, *installing the PostScript board in the lowest available slot*, then the memory boards, from largest (in lower slot) to smallest capacity (in higher slots).

CAUTION Touch the antistatic package or any bare metal area on the printer before removing a board from the antistatic package. Avoid flexing the board or touching components.

10 Remove the board from the antistatic package. Hold the board with your forefingers on the edges next to the holes and your thumbs against the edge on the back, as shown in Figure F-5. Orient the PostScript or memory SIMM board *so the notch is on the left side*.

Figure F-5
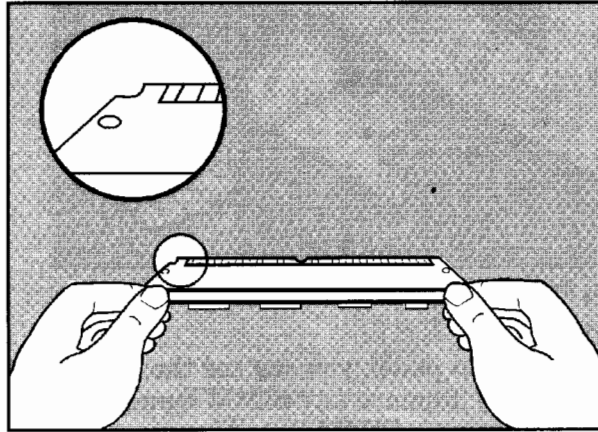
Holding the Board in Position for Installation

11 Hold the board at a 30 degree angle and **firmly** push it *with your thumbs* into the slot as shown in Figure F-6. First, push the board into the back of the slot to fully seat it. Then rotate the board down until the clips on the edges of the slot snap into place (you will feel and hear a "click"). (Illustration ❶ shows the angle of the board during insertion and ❷ shows horizontal placement when seated.)

Figure F-6
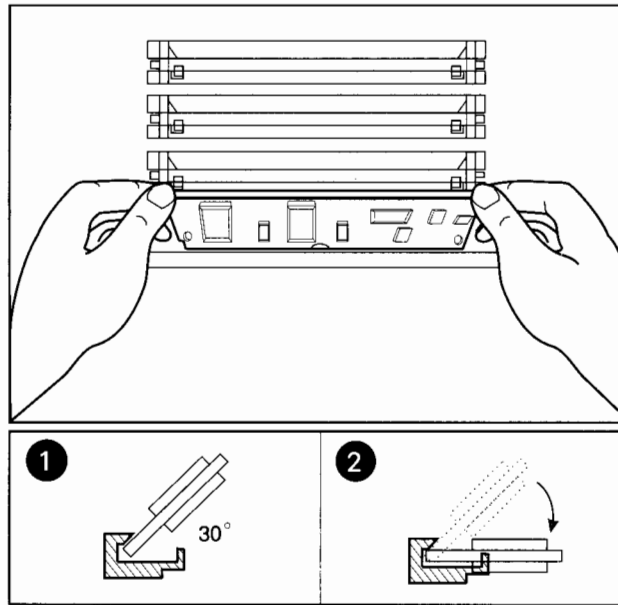
Installing the Board

12 Gently move the board back and forth; if it is seated correctly, it will not lift away from the slot. If it lifts up, the SIMM may not have latched into the slot. Try again.

13 Replace any memory boards in the slot sequence in which they were removed. Ideally, the PostScript SIMM board should be in the lowest available slot, the largest capacity SIMM memory board in the next lowest slot, the next smaller in the next lowest slot, and the next smaller in the highest slot.

14 Replace the metal cover plate. Do not replace the plastic side panel until after you test the board (see "Verifying SIMM Installation" on page F-11).

15 Remove the antistatic wrist strap.

F SIMM Board
Installation

Removing a SIMM Board

Follow these steps when removing SIMM boards:

1 To access a board, repeat steps 1 through 8 in the "Board Installation" section of this manual.

CAUTION To protect a board from static discharge, put on the *antistatic wrist strap* and attach it to the metal as shown in Figure F-4, or touch the antistatic package or any metal part of the printer.

2 Through the open panel you can see the four SIMM board slots. Use your fingers to push against the clips holding the board until the board is released from the clips. If necessary, use a screwdriver to push carefully against the guides (see Figure F-7.)

CAUTION When removing the board with the *screwdriver,* do not touch the screwdriver on anything but the release clips. Use the minimum force necessary; the clips can easily be broken.

Figure F-7
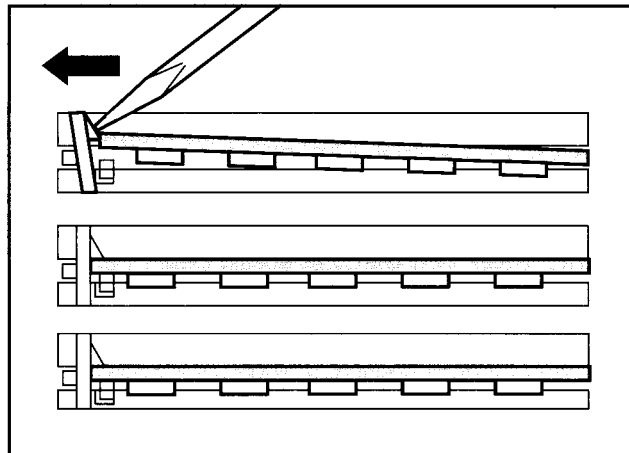
Removing a Board

3 Grasp the board by the edges, next to the holes, and pull the board toward you.

4 If you must reseat the board to troubleshoot an error, refer to the installation procedures described earlier in this guide. If you are not going to use the board again, place it in an antistatic package for safekeeping.

Control Panel PostScript Differences

If you have correctly installed a PostScript language SIMM board, the printer will *automatically* recognize it and add PS MENU to the control panel's sequence of menus.

The Control Panel indicator lights and keys function the same as in the PCL mode except for the **Form Feed** key, which is inactive when in PostScript mode. Printer language (personality) switching (between PCL and PostScript) is automatic.

Verifying SIMM Installation

Follow these steps to verify your SIMM board installation:

1 PLUG IN the power cord and switch the printer ON.

2 After the non-printing self test is complete, the On Line light should go on and 00 READY should appear in the control panel display. (If a different printer message appears, see "Troubleshooting a SIMM Board" later in this guide.)

3 Press **On Line** to take the printer off line.

4 Press **Menu** until TEST MENU appears in the control panel display.

5 Press **Item** once and SELF TEST will appear in the control panel display.

6 Press **Enter** to print a Self Test.

7 Press **On Line** to return the printer on line.

Locate RAM SIZE (in kilobytes) on the self-test printout (see Figure F-1). This is the amount of memory installed in your printer.

Locate the Installed Personalities on the self-test printout (see Figure F-1). PostScript should appear directly beneath the entry for PCL, as shown in the figure. (The self-test printout should also show a status block for the PS Menu.)

If the self-test printout does not reflect your SIMM board, first check to see that the SIMM has been correctly installed. If it has been correctly installed, contact your dealer or HP Service Representative.

Troubleshooting a SIMM Board

Service / Error Messages
These messages can be generated when your printer is checking its internal memory. They appear in the format:

61.x SERVICE

where x = 0, 1, 2, 3, or 4

This error indicates a memory SIMM parity error. The x indicates which SIMM slot generated the error. If x=0, the slot with the failing SIMM could not be determined (slot 1 is the lowest slot). Check the HP part number to make sure you have the right SIMM board; if you do, see the checking procedure on the following page.

62.x SERVICE

where x = 0, 1, 2, 3, 4, 5, or 6

This error indicates that your printer identified a problem while checking memory.

- If x=0, the problem is in internal Read Only Memory (ROM).
- If x = 1, 2, 3, or 4, the problem is in SIMM slot 1, 2, 3, or 4 (slot 1 is the lowest slot).
- If x = 5 or 6, the problem is in an accessory cartridge (5 is top slot; 6 is bottom slot).

Follow the procedure below to check 61.x SERVICE and 62.x SERVICE messages.

1 Switch the printer OFF, then back ON (*Note: data will be lost*).

2 If the error message appears again, switch your printer OFF and UNPLUG THE POWER CORD, then verify that the SIMM board is installed correctly (see installation instructions), and switch the printer ON.

3 If the error message appears again, switch your printer OFF and remove the SIMM board(s) (or cartridge), then switch your printer back ON.

4 If the error message appears again, the problem is in the printer memory. If the error message does not appear, the problem is in the SIMM board or a cartridge. Call your HP Service Representative.

63 NEEDS SERVICE

The printer found a problem in its internal RAM memory.

Switch your printer OFF then ON again to try to clear the error. If the error message appears again call your authorized HP dealer or HP Service Representative.

Validation Error Messages

Validation error messages appear when a SIMM fails to be initialized when the printer is turned on. This error is in the format: 53.XY.ZZ ERROR. Although these errors can be ignored, the SIMM which caused the error will not be configured. For more information on this error, refer to chapter 7, "Troubleshooting," or contact your network administrator.

G

PostScript
Information

Introduction

Typeface refers to the design of characters and symbols. Your PostScript option comes with 35 typefaces. Typefaces of similar design but different character stroke weights, styles, or widths are grouped into families. Your PostScript option contains members of 11 typeface families. See Chapter 4, "Using Type," for more information.

Appendix Contents
This appendix provides the following sections:

- An abbreviated character set sample from each typeface family.
- A brief description of three character sets (symbol sets) along with their character set tables.
- PostScript Technical Notes (statusdict and userdict commands).

Related Documentation
See page 5-23 for a list of commonly available PostScript reference books.

PostScript Typeface Samples

The following pages provide samples of characters from each typeface family. The text typefaces use the standard Adobe ISOLatin1 character set. Symbol and ITC Zapf Dingbats use nonstandard character sets. For these three character sets, see pages G-9 through G-12 following. The characters below are shown in an upright, 12-point size style. Remember, these characters can be scaled to any size.

ITC Avant Garde Gothic

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>?@(\)^_`{|}~
¡¢£/¥ƒ§¤'"«‹›fifl–†‡·¶•,„"»…‰¿
—Æªłø Œºœ|łøœß

ITC Bookman

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>?@[\]^_`{|}~
¡¢£/¥ƒ§¤'"«‹›fifl–†‡·¶•,„"»…‰¿
—ÆªłøŒºœıłøœß

Courier

```
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ \ ] ^ _ ' { |
¡ ¢ £ / ¥ ƒ § ¤ ' " « < > fi fl - † ‡ · ¶ • , „ " » ... ‰ ¿
— Æ ª Ł Ø Œ º æ ı ł ø œ ß
```

Helvetica

```
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>? @ [\]^_'{|}~
¡¢£/¥ƒ§¤'"« ‹ ›fi fl—†‡·¶•,„" » ...‰¿
—Æ ª Ł Ø Œ° æ ı ł ø œ ß
```

Helvetica Condensed

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>?@[\]^_'{|}~
¡¢£/¥ƒ§¤'"«‹›fifl–†‡·¶•,„"»...‰¿
—Æ^{a}ŁØŒ^{o}æıłøœß

New Century Schoolbook

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>?@[\]^_'{|}~
¡¢£/¥ƒ§¤'"«‹›fifl–†‡·¶•,„"»...‰¿
—Æ^{a}ŁØŒ^{n}æıłøœß

Palatino

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>?@[\]^_'{|}~
¡¢£/¥ƒ§¤'"«‹›fifl−†‡·¶•,„"»…‰¿
—ÆªŁØŒ°æıłøœß

Symbol

αβχδεφγηιφκλμνοπθρστυϖωξψζ
ΑΒΧΔΕΦΓΗΙϑΚΛΜΝΟΠΘΡΣΤΥςΩΞΨΖ
0123456789
!∀#∃%&∍()*+,−./:;<=>?≅|∴|⊥_ ‾{|}~
ϒ′≤/∞ƒ♣♦♥♠↔←↑→↓±"≥×∂•÷≠≡≈…|⌡
∠〈©⌈|⌊〉⌡ ⌡⌠|⌡

Times

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,-./:;<=>?@|\]^_'{|}~
¡¢£⁄¥ƒ§¤'"«‹›fifl—†‡·¶•,„"»...‰¿
—ÆªŁØŒ°æıłøœß

ITC Zapf Chancery

abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ
0123456789
!"#$%&'()*+,./:;<=>?@|\|^_'{|}~
¡¢£⁄¥ƒ§¤'"«‹›fifl—†‡·¶•,„"»...‰¿
—ÆªŁØŒºæıłøœß

ITC Zapf Dingbats

PostScript Character Sets

This section includes the following three character set (symbol set) tables:

- The ISOLatin1 character set used by Adobe text typefaces.
- A Symbol character set which includes mathematical and Greek characters which can be used for formulas and equations.
- A Dingbat character set for ITC Zapf Dingbats.

These tables display the characters and symbols for each of the character sets (symbol sets) listed above along with their ASCII decimal equivalents. Characters not found on your keyboard can be inserted into text by using their decimal equivalents. Your software may allow you to access additional characters such as accented characters. Refer to your software package's documentation for information on printing such characters.

Note

Your software may not support some of the following characters. See your software manual for more information on how to print desired characters.

Some characters may not appear on your screen the same way they print unless your software provides matching screen fonts.

Table G-1   ISO Latin1

NUL	DLE	SP	0	@	P	`	p					`	—		
0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
SOH	DC1	!	1	A	Q	a	q			¡	–	`		Æ	æ
1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
STX	DC2	"	2	B	R	b	r			¢	†	´			
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
ETX	DC3	#	3	C	S	c	s			£	‡	^		ª	
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
EOT	DC4	$	4	D	T	d	t			/	·	~			
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
ENQ	NAK	%	5	E	U	e	u			¥		¯			1
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
ACK	SYN	&	6	F	V	f	v			ƒ	¶	˘			
6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
BEL	ETB	'	7	G	W	g	w			§	•	˙			
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
BS	CAN	(	8	H	X	h	x			¤	,	¨		Ł	ł
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
HT	EM	)	9	I	Y	i	y			'	„			Ø	ø
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
LF	SUB	*	:	J	Z	j	z			"	"	°		Œ	œ
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
VT	ESC	+	;	K	[	k	{			«	»	˛		º	ß
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
FF	FS	,	<	L	\	l	|			‹	...				
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
CR	GS	-	=	M	]	m	}			›	‰	˝			
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
SO	RS	.	>	N	^	n	~			fi		˛			
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
SI	US	/	?	O	_	o	DEL			fl	¿	ˇ			
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

Table G-2   Symbol

NUL 0	DLE 16	SP 32	0 48	≅ 64	Π 80	96	π 112	128	144	160	° 176	ℵ 192	∠ 208	◊ 224	240
SOH 1	DC1 17	! 33	1 49	A 65	Θ 81	α 97	θ 113	129	145	ϒ 161	± 177	ℑ 193	∇ 209	⟨ 225	⟩ 241
STX 2	DC2 18	∀ 34	2 50	B 66	P 82	β 98	ρ 114	130	146	′ 162	″ 178	ℜ 194	® 210	® 226	∫ 242
ETX 3	DC3 19	# 35	3 51	X 67	Σ 83	χ 99	σ 115	131	147	≤ 163	≥ 179	℘ 195	© 211	© 227	⌠ 243
EOT 4	DC4 20	∃ 36	4 52	Δ 68	T 84	δ 100	τ 116	132	148	⁄ 164	× 180	⊗ 196	™ 212	™ 228		244
ENQ 5	NAK 21	% 37	5 53	E 69	Y 85	ε 101	υ 117	133	149	∞ 165	∝ 181	⊕ 197	Π 213	Σ 229	⌡ 245
ACK 6	SYN 22	& 38	6 54	Φ 70	ς 86	φ 102	ϖ 118	134	150	ƒ 166	∂ 182	∅ 198	√ 214	(230	) 246
BEL 7	ETB 23	Э 39	7 55	Γ 71	Ω 87	γ 103	ω 119	135	151	♣ 167	• 183	∩ 199	· 215		231		247
BS 8	CAN 24	(40	8 56	H 72	Ξ 88	η 104	ξ 120	136	152	♦ 168	÷ 184	∪ 200	¬ 216		232		248
HT 9	EM 25	) 41	9 57	I 73	Ψ 89	ι 105	ψ 121	137	153	♥ 169	≠ 185	⊃ 201	∧ 217	⌈ 233	⌉ 249
LF 10	SUB 26	* 42	: 58	ϑ 74	Z 90	φ 106	ζ 122	138	154	♠ 170	≡ 186	⊇ 202	∨ 218		234		250
VT 11	ESC 27	+ 43	; 59	K 75	[91	κ 107	{ 123	139	155	↔ 171	≈ 187	⊄ 203	⇔ 219	⌊ 235	⌋ 251
FF 12	FS 28	, 44	< 60	Λ 76	∴ 92	λ 108		124	140	156	← 172	… 188	⊂ 204	⇐ 220	(236	) 252
CR 13	GS 29	− 45	= 61	M 77	] 93	μ 109	} 125	141	157	↑ 173		189	⊆ 205	⇑ 221		237		253
SO 14	RS 30	. 46	> 62	N 78	⊥ 94	ν 110	~ 126	142	158	→ 174	— 190	∈ 206	⇒ 222		238	) 254
SI 15	US 31	/ 47	? 63	O 79	‾ 95	o 111	DEL 127	143	159	↓ 175	↵ 191	∉ 207	⇓ 223		239	255

Table G-3 ITC Zapt Dingbats

NUL	DLE	SP			☆							⑤	①	❼	⇒	
0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
SOH	DC1										⑥	②	❽	➡	⇨
1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
STX	DC2										⑦	③	❾		
2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
ETX	DC3		✓				▲				⑧	④	❿		
3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
EOT	DC4		✔				▼			♥	⑨	⑤	→		
4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
ENQ	NAK	☎	✕				◆				⑩	⑥	→	➡	
5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
ACK	SYN		✖								❶	⑦	↔	➡	
6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
BEL	ETB		✗								❷	⑧	↕		
7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
BS	CAN		✘	★						♣	❸	⑨		➡	
8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
HT	EM	✉		☆			❘			♦	❹	⑩	→	⇨	
9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
LF	SUB						❙			♥	❺	❶		⇨	→
10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
VT	ESC	☞		☆			'			♠	❻	❷	→	⇦	
11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
FF	FS					●	'			①	❼	❸	→	⇨	
12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
CR	GS		†	★		○	"			②	❽	❹	→	⇨	
13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
SO	RS			★		■	"			③	❾	❺	→	⇨	⇒
14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
SI	US		†	☆			DEL			④	❿	❻	➡	⇨	
15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

PostScript Technical Notes (Statusdict Operators)

All PostScript printers use a standard set of PostScript operators
(PostScript language commands) to describe the appearance of a
printed page. If you need assistance in programming in the
PostScript programming language, see the *PostScript Language
Reference Manual* cited at the beginning of this chapter.

Besides the standard set of commands (stored in **systemdict**) as
documented in the *PostScript Language Reference Manual*, the
PostScript option has an additional set of device-specific commands.
These commands provide a way for software and PostScript
programmers to access the special printing features of the LaserJet
4Si printer. A special dictionary, **statusdict**, is used to store these
device-specific commands. User-defined commands are stored in a
third dictionary, **userdict**.

Operator Persistence
A statusdict operator can change a setting for three different
durations:

Persistent Operators marked with an asterisk (*) affect persistent
parameters and change values in NVRAM. These operators modify
settings which will remain in effect through a power cycle, system
language switch, or control panel reset. Operators affecting
persistent parameters must be executed outside the normal
save/restore environment unless stated otherwise (see below).

Semi-Persistent Operators marked with a pair of asterisks (**)
affect semi-persistent parameters and remain in effect from job to job
until there is a control panel reset, system language switch, or
printer power cycle. For a semi-persistent operator, the setting will
revert to the default value after a power cycle, control panel reset, or
system language switch.

Job-by-Job Operators with no asterisk that make changes will
remain in effect only through the current print job.

Changing Persistent Parameters

To change persistent parameters, first exit the normal printer save/restore environment. To do this, execute the following PostScript statement:

serverdict begin password **exitserver**

Password is an integer. The default *password* is 0, but it may be changed to any other integer by executing the **setpassword** operator. After successfully executing this statement, enter the statusdict command as described below.

To access statusdict, execute the following command:

statusdict begin

Once the **statusdict** is accessible, statusdict operators may be used to change system parameters. Some system parameters are stored in the statusdict as ordinary data values (integers, boolean, strings, etc). These values may be read by executing their names or changed using the **def** command.

CAUTION	Only those familiar with the PostScript language should attempt to change persistent parameters. Before changing a parameter, please read all the material relating to it. This will help prevent mistakes that might have undesirable effects on the printer.

System Setup Operators

System setup operators are normally used by the system administrator when the printer is first installed.

setpassword*   *old new* **setpassword** *boolean*

The **setpassword** operator sets the system administrator password. This password must be used to execute the exitserver command and make changes to persistent parameters. The values, *old* and *new*, are 32 bit integers. If *old* is the correct password, **setpassword** changes the password to *new* and returns *true*; otherwise, it returns *false*.

CAUTION   If the password is changed, be sure to record the new integer. Without the password, persistent parameters cannot be modified.

checkpassword   *password* **checkpassword** *boolean*

The **checkpassword** operator returns *true* if password is equal to the current system administrator password; otherwise it returns *false*.

appletalktype***   - **appletalktype** *string*

appletalktype is a *string* that defines the type portion of the printer's AppleTalk name according to the Name Binding Protocol. The value can be changed using the PostScript operators **put, store**, or **def**. If the **appletalktype** string is defined outside of the server loop, the new AppleTalk type will be activated at the end of the current job and will remain in effect until a control panel reset, system language switch, or power cycle occurs. The default is "LaserWriter."

dojamrecovery   - **dojamrecovery** *boolean*

The **dojamrecovery** operator returns a *boolean* which indicates whether jam recovery is on or off. If boolean is true, jam recovery is on. If *boolean* is *false,* jam recovery is off. The value is set by the control panel *JAM RECOVER* menu item.

setdoprinterrors*   *boolean* **setdoprinterrors** -

The **setdoprinterrors** operator enables the printing of PostScript error messages. If *boolean* is *true,* the printing of PostScript error messages is enabled. If *boolean* is *false,* PostScript error messages are not printed. Error messages can be helpful for debugging PostScript programs. When **doprinterrors** is *true,* errors are printed automatically by a built-in error handler called "ehandler.ps" which is similar to the "ehandler.ps" procedure documented in Appendix A of the *PostScript Language Program Design* cited on page 5-25.

doprinterrors   - **doprinterrors** *boolean*

Returns a *boolean* indicating whether or not the PostScript error messages are printed. If *boolean* is *true,* the printing of PostScript error messages is enabled. If *boolean* is *false,* PostScript error messages are not printed.

Job Control Operators

The following operators are used at the beginning of a print job to control the job's printing environment.

setdoautocontinue**   *boolean* **setdoautocontinue** -

The setdoautocontinue operator turns the auto continue feature on or off. If *boolean* is *true*, auto continue is turned on. If *boolean* is *false*, auto continue is turned off. If auto continue is on, system error messages will appear in the control panel display window for ten seconds. However, if auto continue is on, no PostScript errors will be displayed. After ten seconds the printer returns on line and resumes operation. If auto continue is off, system error and PS error messages remain in the display window until the user corrects the problem, commands the printer to continue, or both. The setting for **setdoautocontinue** will override the control panel setting. After a control panel reset, system language switch or power cycle, auto continue reverts to the mode set by the the control panel AUTO CONT menu item.

doautocontinue   - **doautocontinue** *boolean*

Returns a *boolean* set to *true* if auto continue is currently on, otherwise returns *false*.

setdoret   *integer* **setdoret** -

The setdoret operator sets your printer's Resolution Enhancement technology (RET) to the *integer* specified. Valid values for *integer* are: 0 = off, 1 = light, 2 = medium, 3 = dark. At the end of the job, the Resolution Enhancement setting reverts to the control panel RET menu value (ON or OFF).

doret   - **doret** *integer*

Returns an *integer* indicating the current RET setting. Possible *integer* values are: 0 = off, 1 = light, 2 = medium, 3 = dark.

Duplex Operators

The following PostScript operators control duplex printing.

defaultduplexmode - **defaultduplexmode** *boolean*

The defaultduplexmode operator returns a *boolean* indicating the default printing mode. *True* indicates duplex (double-sided) printing. *False* indicates simplex (single-sided) printing. The value is set by the control panel DUPLEX menu item.

setduplexmode *boolean* **setduplexmode** -

The setduplexmode operator sets the printing mode to duplex or simplex. When *true*, the printing mode is duplex (double-sided). When *false*, the printing mode is simplex (single-sided). If the duplex option is not installed or the printer has less than 4 MBytes of RAM, the PostScript interpreter will post a **rangecheck** error if *boolean* is *true*. At the end of the job, the printing mode reverts to the mode set by the control panel DUPLEX menu item.

duplexmode - **duplexmode** *boolean*

The duplexmode operator returns a *boolean* indicating the current printing mode. *True* indicates duplex (double-sided) printing. *False* indicates simplex (single-sided) printing.

defaulttumble - **defaulttumble** *boolean*

The **defaulttumble** operator returns a *boolean* indicating the default tumble mode. *True* indicates the second side is upside down in comparison to the first side. *False* indicates the second side has the same orientation as the first side. The value is set by the control panel BIND menu item. If BIND=LONGEDGE*, **defaulttumble** will be *false*. If BIND=SHORTEDGE*, **defaulttumble** will be *true*.

settumble   *boolean* **settumble** -

The **settumble** operator sets the value for **tumble**. When *boolean* is *true*, the second side of a duplex page is upside down in comparison to first side (this mode is often used for printing calendars). When *boolean* is *false*, the second side has the same orientation as the first side (this mode is often used for printing novels). At the end of the job the tumble mode reverts to the mode set by the control panel BIND menu item.

tumble   - **tumble** *boolean*

The tumble operator returns a *boolean* indicating the current tumble mode. *True* indicates the second side is upside down in comparison to the first side. *False* indicates the second side has the same orientation as the first side.

firstside   - **firstside** *boolean*

The firstside operator returns a *boolean* indicating whether or not the image being created falls on the first side of a logical page. *boolean* will always be *true* for the first page of a job. In simplex mode, the returned *boolean* represents odd/even pages with *true* meaning odd and *false* meaning even.

Media Type Operators

Media type operators are used to establish the imaging area. The PostScript option definitions for **letter** and **legal** deviate from the definitions in the *PostScript Language Reference Manual*, and the rest of the operators in this section are additions to the media type operators in the *PostScript Language Reference Manual*. Media type operators are in **userdict** rather than **statusdict**. Any marks made on the imaging area before executing a media type operator are cleared.

letter   - letter -

The **letter** operator establishes an imaging area of 8.00 x 10.50 inches centered on an 8.5 x 11.0 inch page.

legal   - legal -

The **legal** operator establishes an imaging area of 8.00 x 13.50 inches centered on an 8.5 x 14.0 inch page.

executivepage   - executivepage -

The **executivepage** operator establishes an imaging area of 6.72 x 10.00 inches centered on a 7.25 x 10.50 inch page.

a4   - a4 -

The **a4** operator establishes an imaging area of 197.8 x 284.5 mm centered on a 210 x 297 mm page.

com10envelope   - com10envelope -

The **com10envelope** operator establishes an imaging area of 3.63 x 9.00 inches centered on a 4.125 x 9.50 inch envelope.

monarcenvelope   - monarcenvelope -

The **monarcenvelope** operator establishes an imaging area of 3.41 x 7.00 inches centered on a 3.875 x 7.50 inch envelope.

dlenvelope   - dlenvelope -

The **dlenvelope** operator establishes an imaging area of 97.54 x 207.3 mm centered on a 110 by 220 mm envelope.

Tray Selection Operators

Tray selection operators are used to select media either by tray location or media size.

defaultpapertray   - defaultpapertray *integer*

The **defaultpapertray** operator returns an *integer* indicating the default paper tray. The only valid values for *integer* are 0 = upper tray or 1 = lower tray. The value is set by the control panel TRAY menu item.

setpapertray   *integer* **setpapertray** -

The **setpapertray** operator sets the tray from which paper will be fed. An *integer* value of 0 selects the upper tray, an *integer* value of 1 selects the lower tray, and an *integer* value of 2 selects the envelope feeder, if an envelope feeder is installed. At the end of the job, papertray reverts to the control panel TRAY menu value.

papertray   - papertray *integer*

The **papertray** operator returns an *integer* indicating the paper tray currently selected. The returned value can be 0 = upper tray ,1 = lower tray, or 2 = automatic envelope feeder.

defaulttrayswitch   - defaulttrayswitch *boolean*

The **defaulttrayswitch** operator returns a *boolean* indicating whether default automatic tray selection is enabled or disabled. If *boolean* is *true*, then default automatic tray selection is enabled. If *boolean* is *false*, then default automatic tray selection is disabled. The value is set by the control panel TRAY menu item.

settrayswitch   *boolean* **settrayswitch** -

The **settrayswitch** operator enables or disables the automatic tray selection. Set *boolean* to *true* to enable automatic tray selection. Set *boolean* to *false* to disable automatic tray selection. Automatic tray selection means that the printer will take paper from any tray (upper or lower) containing the correct paper size. At the end of the job, automatic tray selection reverts to the mode set by the control panel TRAY menu item.

trayswitch   - **papertray** *boolean*

The **trayswitch** operator returns a *boolean* indicating whether automatic tray selection is currently enabled or disabled. If *boolean* is *true*, then automatic tray selection is currently enabled. If *boolean* is *false*, then automatic tray selection is currently disabled.

lettertray   - **lettertray** -

The **lettertray** operator causes the printer to look for a tray containing letter size paper. If one is found, papertray is set to the tray containing letter size media and a letter size imaging area is installed. A **rangecheck** occurs if the tray is not found.

legaltray   - **legaltray** -

The **legaltray** operator causes the printer to look for a tray containing legal size paper. If one is found, **papertray** is set to the tray containing legal size media and a legal size imaging area is installed. A **rangecheck** occurs if the tray is not found.

executivetray   - executivetray -

The **executivetray** operator causes the printer to look for a tray containing executive size paper. If one is found, *papertray* is set to the tray containing executive size media and an executive size imaging area is installed. A **rangecheck** occurs if the tray is not found.

a4tray   - a4tray -

The **a4tray** operator causes the printer to look for a tray containing A4 size paper. If one is found, papertray is set to the tray containing A4 size media and an A4 size imaging area is installed. A **rangecheck** occurs if the tray is not found.

com10envelopetray   - com10envelopetray -

The **com10envelopetray** operator causes the printer to look for the automatic envelope feeder containing com10 envelopes. If one is found, *papertray* is set to the automatic envelope feeder (2) and a com10 size imaging area is installed. If one is not found, a **rangecheck** will occur.

monarcenvelopetray   - monarcenvelopetray -

The **monarcenvelopetray** operator causes the printer to look for the automatic envelope feeder containing monarc envelopes. If one is found, *papertray* is set to the automatic envelope feeder (2) and a monarc size imaging area is installed. If one is not found, a **rangecheck** will occur.

dlenvelopetray   - dlenvelopetray -

The **dlenvelopetray** operator causes the printer to look for the automatic envelope feeder containing DL envelopes. If one is found, the page type is set to DL, *papertray* is set to the automatic envelope feeder (2), and a DL size imaging area is installed. If one is not found, a **rangecheck** will occur.

Output Bin Operators

The **output bin** operators allow control over the media destination.

defaultoutputtray   - **defaultoutputtray** *integer*

The **defaultoutputtray** operator returns an *integer* indicating the default output bin number. An *integer* value of 0 indicates the default output bin is the upper bin (face-down output). An *integer* value of 1 indicates the default output bin is the lower bin (face-up output). The value is set by the control panel OUTPUT BIN menu item.

setoutputtray   *integer* **setoutputtray** -

The **setoutputtray** operator sets the output bin. An *integer* value of 0 sets the output bin to be the upper bin (face-down output). An *integer* value of 1 sets the output bin to be the lower bin (face-up output). At the end of the job, the output bin reverts to the control panel OUTPUT BIN menu value.

outputtray   - **outputtray** *integer*

The **outputtray** operator returns an *integer* indicating the active output bin number. An *integer* value of 0 sets the output bin to be the upper bin (face-down output). An *integer* value of 1 sets the output bin to be the lower bin (face-up output).

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