HEWLETT PACKARD

LineJet™

Printers

User's Guide

LineJet™ Printers

User’s Guide

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Table of Contents

1 *Introduction*

About This Guide

This manual explains how to set up, configure, and perform service on the printer so that it works properly and efficiently.

The *User's Guide* is designed so you can quickly find the information you need to install and configure your Hewlett-Packard® LineJet™ printer.

Warnings and Special Information

Read and comply with all information highlighted under special headings:

Warning 	**Warning messages call attention to situations that could hurt you or damage the equipment.**
Caution 	Caution messages indicate procedures which, if not observed, could result in damage to equipment.
Note 	Notes give you helpful hints about printer operation and maintenance.

Related Documents

Following is a list of related documentation shipped with every LineJet printer.

- This manual, the *LineJet Printers: User's Guide* (P/N 171252-001PX) provides configuration instructions and descriptions and troubleshooting guidelines.
- *LineJet Printers: Installation Instructions, Cabinet and Pedestal Models* (P/N 171253-001PX) — Explains in a step-by-step process how to set up the printer for operation.
- *LineJet Printers: Quick Reference Guide* (P/N 171248-001PX) — Describes the keys on the control panel and provides quick reference information on daily printer operations such as loading paper and replacing ribbons. Italian, French, German, and Spanish are included.
- *LineJet Printers: PCL-II/LinePrinter Plus Technical Reference Manual* (P/N 171249-001PX) — Describes the host control codes and character sets for the LinePrinter Plus® and PCL®-II emulations.
- The *LineJet Printers: Maintenance Manual* (P/N 171179-001PX) is not shipped with the printer, but can be ordered. It explains how to maintain and repair the LineJet printer at the field service level of maintenance. This manual covers alignments and adjustments, preventive and corrective maintenance, troubleshooting, and basic principles of operation.
- *QMS Code V Technical Reference Manual* (P/N 171251-001PX) — Explains how to write graphics programs using the optional QMS® Code V™ Printronix® emulation. This graphics programming language allows the user to create and store forms; generate logos, bar codes, and expanded characters; create other graphics, and merge graphics with alphanumeric data as a document is printed.
- *LineJet Print Server User's Guide* (P/N 170989-001PX) — Explains how to set up and use the LineJet's Ethernet™ network interface card for several host computer platforms.

Printing Conventions in This Guide

UPPERCASE print indicates control panel keys.
Example: Press the CLEAR key, then press the ON LINE key.

Quotation marks (" ") indicate messages you see on the Liquid Crystal Display (LCD).
Example: Press the ON LINE key. "OFFLINE" appears on the LCD.

The **+** (plus) symbol represents key combinations.
Example: "Press ▲ + ▼" means press the ▲ (UP) key and the ▼ (DOWN) key at the same time.

Printer Overview

The LineJet Printer Family

The LineJet series of line matrix printers consists of 500, 1000, and 1500 lines per minute (lpm) models packaged in various configurations. All of the models offer software versatility and the latest refinements in line matrix printing technology. The model numbers indicate printing speed and physical configuration:

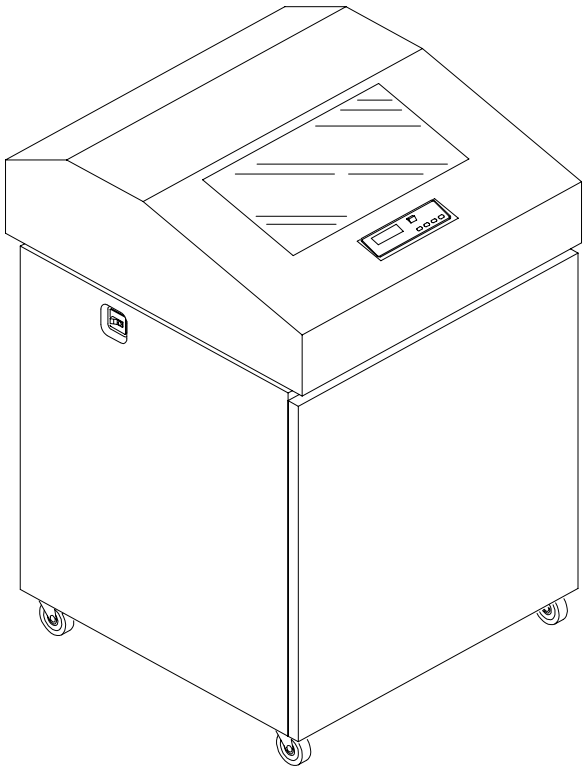
Table 1. The LineJet Printer Family

Model Number	Nameplate	Print Speed	Pedestal	Cabinet	Power Stacker
C3201D	LineJet 500P	500 lpm	✓		
C3202D	LineJet 500Q	500 lpm		✓	
C3204D	LineJet 1000Q	1000 lpm		✓	
C3205D	LineJet 1500Q	1500 lpm		✓	
C5640D	LineJet 1500Q	1500 lpm		✓	✓

Most line matrix printers have specialized architectures, which enable the printer to emulate, or behave like, another printer. These specialized architectures are restricted. The LineJet printer, however, introduces an open architecture concept that is not available on any other line matrix printer.

The LineJet printer offers the standard emulation of Hewlett-Packard's Printer Control Language, PCL Level II, to allow easy online programming capabilities and compatibility with Hewlett-Packard systems.

Additionally, the LineJet printer offers the following three emulations as part of its LinePrinter Plus grouping: the Proprinter® III XL, Epson® FX-1050, and P-Series emulations. No matter what emulation is configured, your printer is very easy to use. The message display and indicator on the control panel communicate with you directly and clearly. You can select every function on your printer at the control panel, or you can send commands from the host computer.



C3202D
C3204D
C3205D
C5640D

C3201D

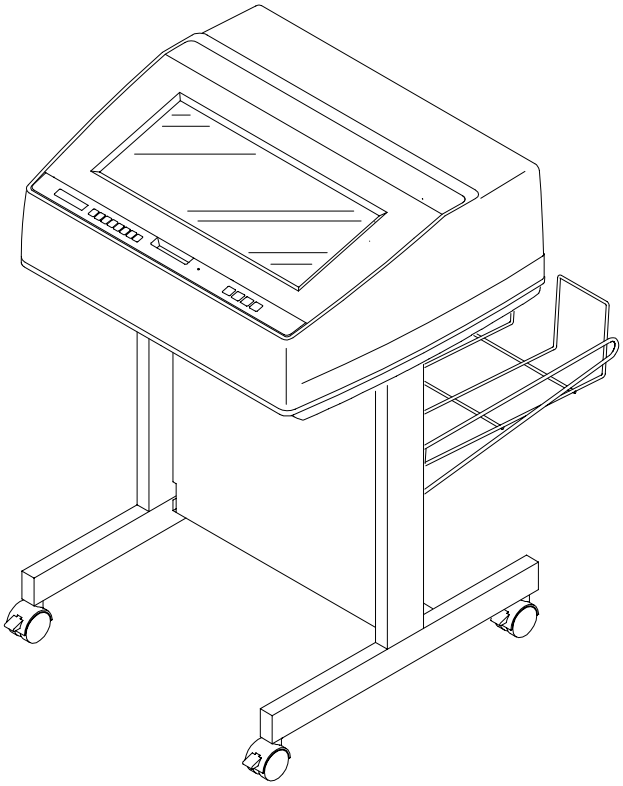


Figure 1. The LineJet Printers

Taking Care of Your Printer

Your printer will produce high quality print jobs if it is well taken care of. Periodic cleaning, handling the printer properly, and using the correct printer supplies, such as paper and ribbons, will ensure optimum performance. Chapter 5 explains how to clean the printer, and printer supplies are listed in Appendix A.

Whenever it is necessary to service the printer, remember these important maintenance concepts:

- Use only the ribbons specified in Appendix A. Use of incorrect ribbons can lead to ink migration problems, degraded print quality, and expensive damage to the printer.
- Incorrect closure of the forms thickness lever can lead to smearing, degraded print quality, paper jams, and damage to the platen and shuttle assembly. Never close the forms thickness lever too tightly.
- Excessive printing outside of the boundaries of the paper will degrade print quality and cause hammer bank damage. Never print outside of the paper width.

Standard Features

All of the printers offer a wide range of horizontal and vertical dot densities, operate quietly, and can load an emulation very easily. Other features are specified in the following sections.

Host Computer Interfaces

The following host computer interface choices are available:

- Centronics®
- RS-232 serial interface
- RS-422 serial interface
- Bi-Tronics®
- Ethernet (optional)

Printer Emulations

The following printer emulations (or protocols) are selectable at the control panel:

- HP® PCL-II (the default)
- LP Plus, which consists of:
  Printronix P-Series
  Epson FX-1050
  IBM® Proprinter III XL
- Code V (optional)

Each emulation provides a different set of configuration menus, control codes, and character sets.

Output Control

Depending on the active emulation, the printers have the following output control features:

- Four modes for printing text:
  1. Correspondence (High Density)
  2. Data Processing (DP) (Standard Density)
  3. Sparse (high speed) (Sparse Density)
  4. OCR A and OCR B
- Selectable forms length and width
- Character attribute specification:
  1. Selectable pitch: normal, expanded, and compressed
  2. Emphasized (**shadow**) printing
  3. Automatic underlining and overscoring
  4. Superscript and subscript printing
  5. Double high and wide printing
- Resident multinational character sets and bar codes

Graphics and Vertical Formatting

Several graphics and vertical formatting features are available:

- Built-in graphics generators:
  1. IBM Proprinter III XL bit-image graphics
  2. Epson FX-1050 dot graphics mode
  3. P-Series Plot
  4. PCL raster graphics
- Programmable electronic vertical formatting provides rapid vertical paper movement to specified lines for printing repetitive and continuous forms. You can choose from the following methods:
  1. Vertical tabbing in Proprinter III XL and Epson FX emulation modes
  2. Electronic Vertical Format Unit (EVFU) in P-Series emulation mode
  3. PCL vertical forms control (VFC)

Built-in Diagnostic Tools

The following diagnostic tools are provided with the printer:

- Comprehensive diagnostic self-tests permanently stored in the printer
- Configuration printout
- Data stream hex code printout
- Symbol set printout

Graphics Options

The Code V emulation allows you to create and store forms, generate logos, bar codes, expanded characters, and create other graphics. Alphanumerics and bar code data are added as the form is printed.

This emulation is available as a customer-installed option. For more information, contact your authorized Hewlett-Packard representative.

Protocols and Emulations

A *protocol* is a set of rules governing the exchange of information between the printer and its host computer. These rules consist of codes which manipulate and print data and allow for machine-to-machine communication. A printer and its host computer must use the same protocol.

Most impact printers use single ASCII character codes to print text, numbers, and punctuation marks. Some characters, both singularly and in groups of two or more, are defined as control codes. Control codes instruct the printer to perform specific functions, such as underlining text, printing subscripts, setting page margins, etc. The main difference between most printer protocols is in the characters used to create control codes and the ways in which these characters are formatted.

When the printer executes the character and control codes of a particular printer protocol, it is “emulating” that printer. If the printer uses the Proprinter III XL protocol, for example, it is emulating an IBM Proprinter III XL printer. If the printer is using the Epson FX-1050 printer protocol, for example, we can also say it is in Epson FX-1050 emulation mode. As used in this manual, *protocol* and *emulation* mean the same thing.

Line Matrix Printing

Your printer is an impact printer; it creates characters by printing ink dots on paper. The dots are printed on an invisible matrix mapped in printer memory. (See Figure 2.) Dot impressions are made by an array of steel hammers mounted on a rapidly oscillating shuttle. The hammers strike the paper through a moving ink ribbon.

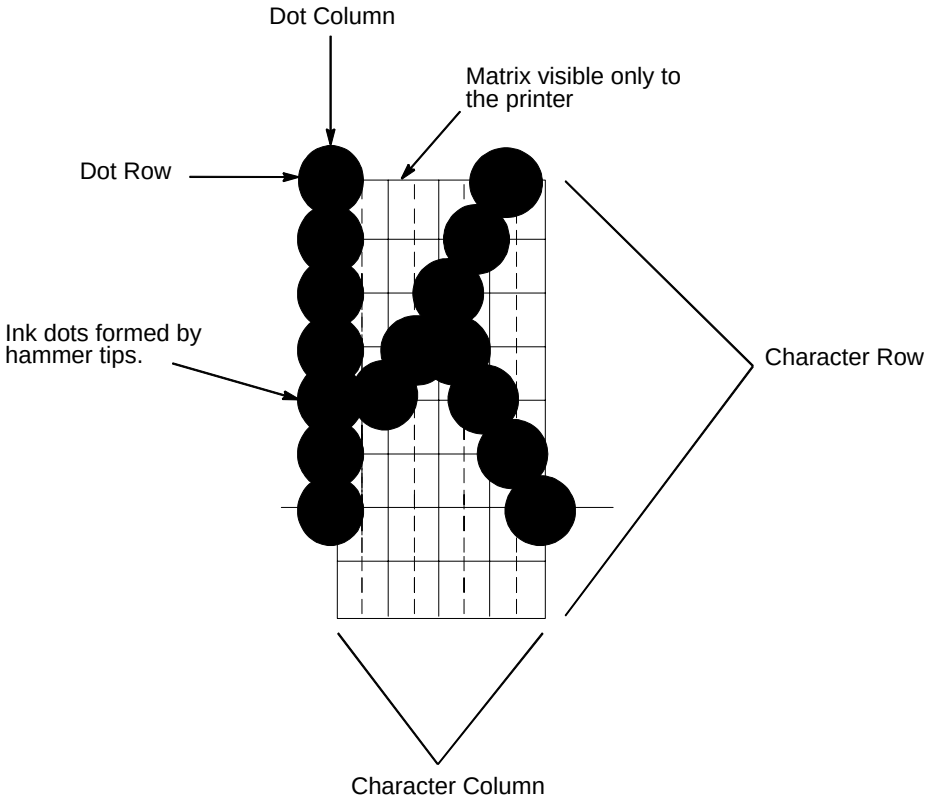
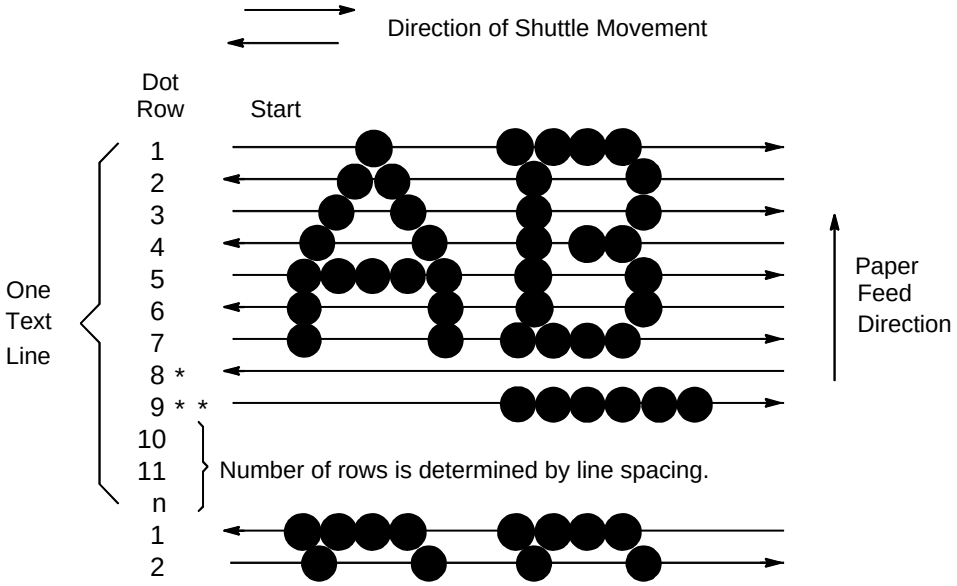


Figure 2. Dot Matrix Character Formation

Serial matrix printers use a moving printhead with pins to form single characters sequentially along the printed line. Unlike serial matrix printers, the LineJet printer is a *line matrix* printer. Line matrix printers divide every printable line into horizontal dot rows, then print a dot row of the entire line at every lateral sweep of the shuttle.

During each sweep of the shuttle, hammers are activated to print dots at the required positions in the dot row. When the shuttle reaches the end of a sweep, it reverses direction, the paper advances one dot row, and the hammers print the next row of dots as the shuttle sweeps in the opposite direction, as shown in Figure 3.

After a line of characters is printed, the paper advances to the first dot row of the next print line. This creates a number of blank rows between lines of characters, depending on the print mode and line spacing you selected.



* This row is used only for lowercase descenders.

** This row is used for underlining and lowercase descenders.

Figure 3. Dot Matrix Line Printing

Printing Speed

The speed at which text prints is measured in lines per minute (lpm). This speed is directly proportional to the number of dot rows required to produce a character line, regardless of the number of characters in the line. More dot rows are required to print lowercase characters with descenders; consequently, those character lines print at a fractionally lower rate.

The printer also prints dot-addressable graphic images. The speed at which graphics are plotted is measured in inches per minute (ipm). Unidirectional plotting produces slightly better print quality and takes about twice as long as bidirectional plotting. You can select either plotting mode from the control panel.

Printing and plotting rates also vary according to the print mode you select. Print mode refers to the way you instruct the printer to create characters. If, for example, you select standard quality (data processing) mode, the printer uses more dot rows to form characters than if you choose Sparse (high speed) mode. Character formation and print speed are faster in Sparse mode because the printer prints fewer dot rows to form characters. Vertical dot density is a factor in printing speed.

Nominal printing rates are charted in Appendix A.

2 *Configuring the Printer*

Overview

Note

Configuration directly affects printer operation. Do not change the configuration of your printer until you are thoroughly familiar with the procedures in this chapter.

This chapter is a tutorial that explains how to configure the LineJet printer.

In order to print data, the printer must respond correctly to signals and commands received from the host computer. Configuration is the process of matching the printer's operating characteristics to those of the host computer and to specific tasks, such as printing labels, or printing on different sizes of paper.

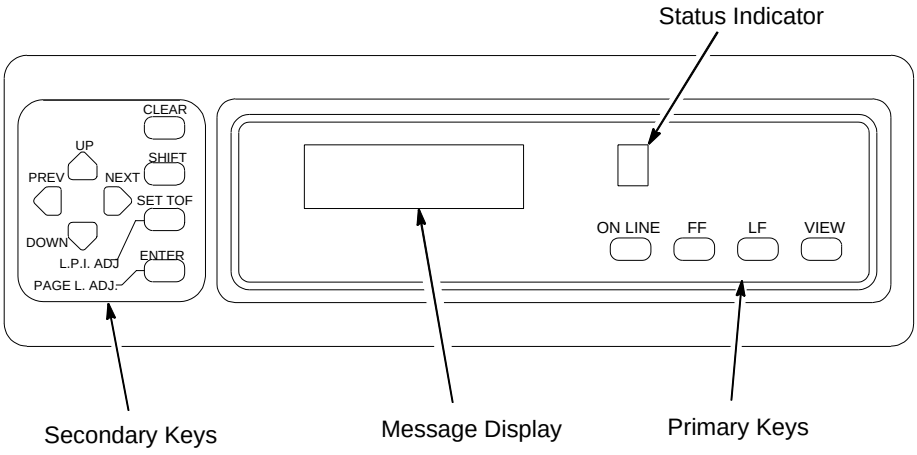
The characteristics that define the printer's response to signals and commands received from the host computer are called configuration parameters.

A configuration consists of all the parameters under the Active Emulation, Emulation, Maint/Misc., Host Interface, Printer Control and Diagnostics menus. Chapter 3 describes the configuration submenus and their parameters in more detail.

You configure the printer by pressing keys on the control panel (Figure 4) or by sending control codes from the host computer. This chapter explains how to change parameters and save, print, and load configurations with the control panel. All of the keys are described in detail in the *LineJet Printers: Quick Reference Guide*, shipped with each printer.

To configure the printer with control codes, refer to the appropriate *Technical Reference Manual*.

Cabinet Model



Pedestal Model

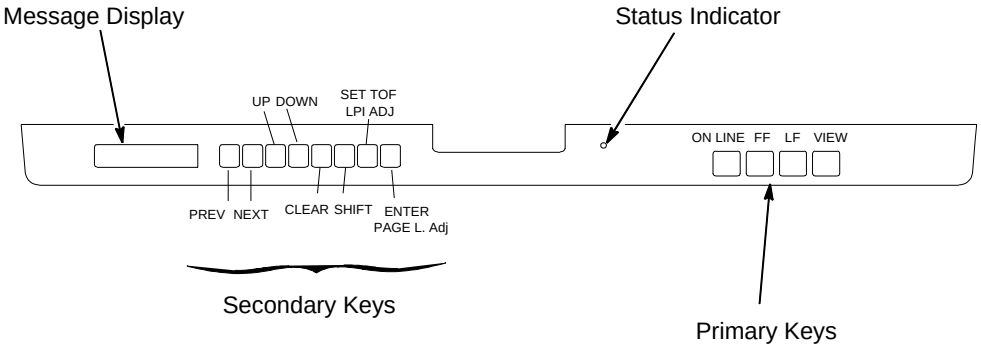
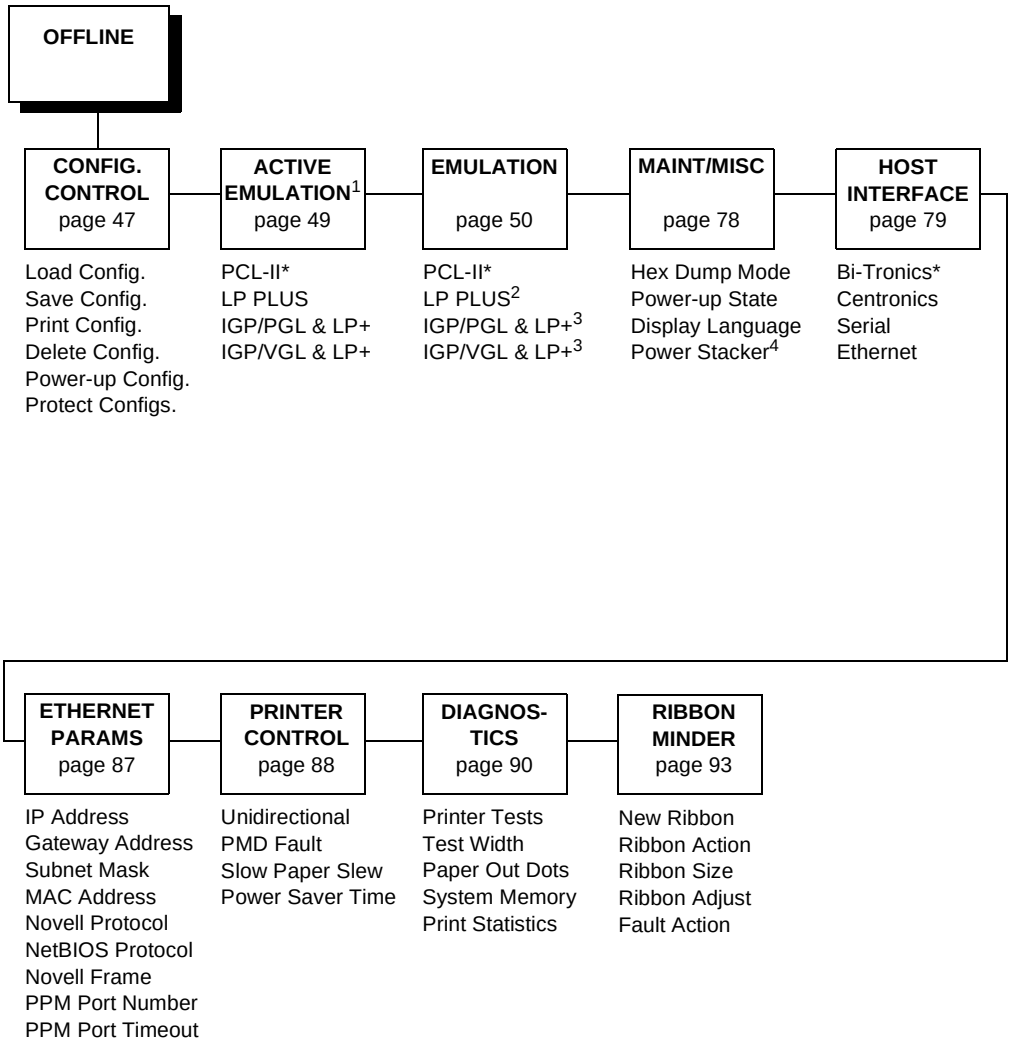


Figure 4. The Control Panels



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

[1] Choices available are limited to the emulations installed on the printer.
[2] Appears only if LP Plus is the active emulation.
[3] Appears only if the option is installed.
[4] Appears only if installed.

Figure 5. Configuration Menu Overview

Operating Modes

The printer has two operating modes: online and offline. When the printer is online, it is controlled by the host computer and prints data sent by the host computer. If the printer is offline, communication with the host is interrupted so you can load paper, change ribbons, or test and configure the printer.

You activate configuration settings with the ENTER key, which “enters” your new setting into printer memory. An asterisk (*) after a displayed setting shows it is entered into memory.

If pressing ENTER to select a parameter produces no result, press DOWN to move to the next lower level. For example, if you press ENTER while “CONFIG. CONTROL/ Print Config.” displays, nothing will happen because another level exists below this selection. Press DOWN and the “Current” option displays. To cycle through the choices (Current, Factory, Power-up, etc.), press the NEXT or PREV keys. Press ENTER and the selected configuration will print.

The Configurations

A configuration consists of a group of parameters, such as line spacing, forms length, etc. Your printer contains the following configurations:

- The factory default configuration. It can be loaded, but it cannot be altered. All of the parameters and their values are listed on page 28.
- Eight configurations that you can customize for unique print job requirements. Creating customized configurations is explained on page 30.

Locking and Unlocking the ENTER Key

To make configuration changes, you must unlock the ENTER key. With the printer offline, raise the printer cover and press the UP and DOWN keys simultaneously. The message display will show this message for about a second:

```
ENTER SWITCH
UNLOCKED
```

When you lock the ENTER key, your configuration settings are fixed and cannot be altered. Locking secures your settings.

With the printer offline, raise the printer cover and press the UP and DOWN keys simultaneously to lock the ENTER key. The message display will show this message briefly:

```
ENTER SWITCH
LOCKED
```

Changing and Saving Parameter Settings

You can change a parameter setting, such as line spacing or forms length, by pressing keys on the control panel or by sending emulation control codes in the host data stream. The *Technical Reference Manuals* provide information about control codes.

When you change a parameter, it is active as long as the printer is on. This is true whether you used the control panel or sent a control code from the host.

If you use the control panel, you can save the parameters as a customized configuration. A configuration consists of a group of parameters. A saved configuration will not be lost if you turn off the printer.

You can change a parameter with a control code, but to save the parameter setting you must use the control panel.

Control codes override control panel parameters. For example, if you set the line spacing to 6 lpi with the control panel, and application software later changed this to 8 lpi with a control code, the control code setting overrides the control panel setting.

The 8 lpi parameter is effective as long as the printer is on. If you turn off the printer, the 8 lpi parameter will be erased. To save the parameter, you must use the control panel and save it as a configuration.

You can save up to eight configurations.

Changing parameters is discussed on page 30, saving configurations is discussed on page 32.

Factory Default Configuration Values

The factory default values are permanently stored in memory as a configuration. They cannot be modified or erased.

```
ACTIVE EMULATION                          PCL-II
PCL-II
       Primary Char. set
          ID                              0
          Symbol Set                      Roman-8(8U)
          Pitch                           10.00
          Density                         Data Processing
       Second Char. set
          ID                              0
          Symbol Set                      Roman-8(8U)
          Pitch                           10.00
          Density                         Data Processing
       Page Length Rep.                   Inches/Page
       Max. Line Width                    13.2 inches
       Graphics Density                   60 DPI
       Perforation Skip                   Disable
       Display Functns                    Disable
       Line Terminator
          LF After CR                     Disable
          CR After LF                     Disable
          CR after FF                     Disable
          CR After VT                     Enable
       PTX Linefeed                       Disable
       LPI Adjust                         6 LPI
       Page L./Lines                      66 Lines
       Page L./Inches                     11.0 Inches
       Config. Print
       Symbol Set Print
       Reset Cmd CFG Ld                   Power Up Config
LP PLUS
       Printer Protocol
          P-Series
             Control Code 06              8.0 LPI
             Control Code 08              Elongated
             Define CR Code               CR = CR
             Auto LF                      Disable
             Overstrike                   Enable
             Define LF code               LF = CR + LF
             Select SFCC                  1
             EVFU Select                  Enable
             Alt. Set 80-9F               Control Code
             Character Set
                IBM PC
                   Primary Subset         ASCII (USA)
                   Extended Subset        Code Page 437
             SFCC d command               Even dot plot
       CPI/LPI Select
          Select CPI                      10.0 CPI
          Select LPI                      6.0 LPI
       Font Attributes
          Typeface                        Data Processing
          Prop. Spacing                   Disable
          Bold Print                      Disable
          Italic Print                    Disable
          Slashed Zero                    Disable
       Page Format
          Form Length
             Abs. Length IN               11.0 inches
```

Abs. Length MM	279.4 mm
Funct. of lines	66 lines
Form Width	
Abs. Width IN	13.6 inches
Abs. Width MM	345.4 mm
Function of CPI	136 characters
Margins	
Left Margin	0 columns
Right Margin	0 columns
Bottom Margin	0 lines
Perforation Skip	Disable
MAINT / MISC	
Hex Dump Mode	Disable
Power-up State	Online
Display Language	English
Power Stacker	Enable
HOST INTERFACE	
Bi-Tronics	
Prime Signal	Disable
TOF Action	Reset
Buffer Size in K	1
ETHERNET PARAMS	
IP Address	xxx.xxx.xxx.xxx
Gateway Address	xxx.xxx.xxx.xxx
Subnet Mask	xxx.xxx.xxx.xxx
MAC Address	hhhhhhhhhhhh
Novell Protocol	Enable
NetBIOS Protocol	Enable
Novell Frame	Auto Sensing
PPM Port Number	3001
PPM Port Timeout	32 seconds
PRINTER CONTROL	
Unidirectional	Disable
PMD Fault	Enable
Slow Paper Slew	Disable
Power Saver Time	15 min
DIAGNOSTICS	
Printer Tests	Shift Recycle
Test Width	Full Width
Paper Out Dots	40 dots
System Memory	4 Megabytes
Print Statistics	
On:	x.x Hrs
Print:	x.x Hrs
Print Strokes	x
Print Lines	x
11 inch Pages	X
RIBBONMINDER	
New Ribbon	
Ribbon Action	Disable
Ribbon Size	60 yards[1]
Ribbon Adjust	0
Fault Action	New Ribbon

[1]Default Ribbon Size for pedestal models is 60 yards.
Default Ribbon Size for cabinet models is 100 yards.

Changing Parameters

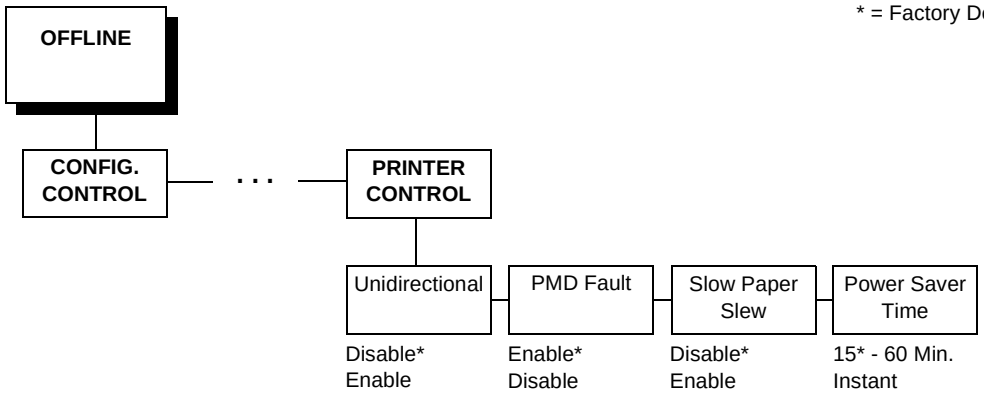
A configuration consists of several parameters. The factory configuration is PCL-II emulation using the Bi-tronics interface. You can keep this configuration to print your jobs, or if your print job requires a different setting, such as a serial interface, follow the steps on the next page.

Example

Setting Unidirectional is provided as an example. Use this example as a basic guideline to move throughout the configuration menu and change other parameters.

Figure 5 on page 25 shows the top level of the configuration menu. The submenus are shown in Chapter 3.

If the configuration has already been changed and you do not know what the current configuration is, print a copy (page 34). Then decide if you must change any parameters.



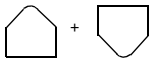
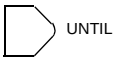
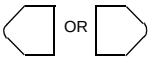
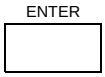
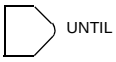
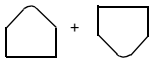
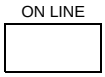
Note

Once you change active emulations, any changes to the previously selected emulation will be gone unless they have been saved.

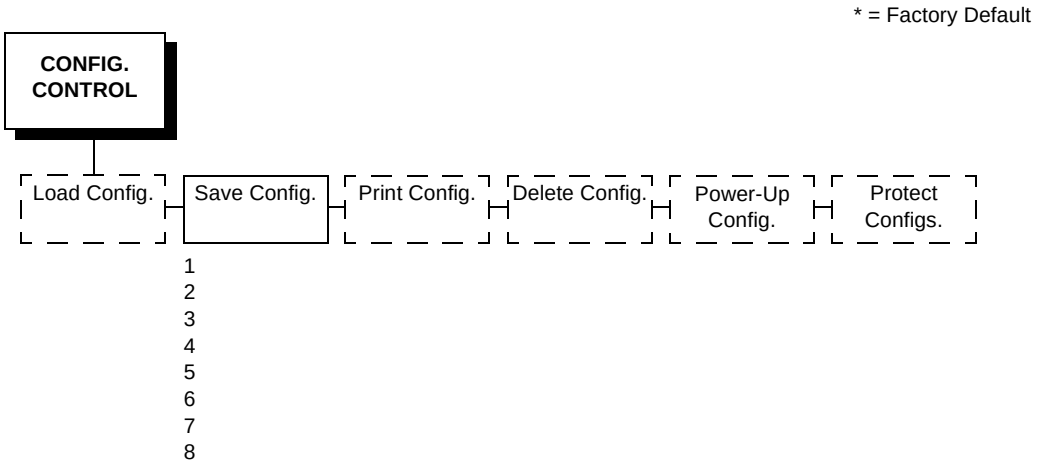
Table 2. Parameter Change Example Procedure

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	

Table 2. Parameter Change Example Procedure (continued)

Step	Key	Result	Notes
3.		ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.		OFFLINE PRINTER CONTROL	
5.		PRINTER CONTROL Unidirectional	
6.		Unidirectional Disable*	
7.		Unidirectional Enable	Cycle through the choices.
8.		Unidirectional Enable*	An asterisk (*) indicates this choice is active.
TO SAVE YOUR CHANGES AS A CONFIGURATION THAT IS STORED IN MEMORY:			
1.		OFFLINE PRINTER CONTROL	
2.		OFFLINE CONFIG. CONTROL	
3.	Go to the CONFIG. CONTROL submenu Save Config. option, as described on page 33, step 4.		
TO USE THE CURRENT CONFIGURATION WITHOUT SAVING:			
1.		ENTER SWITCH LOCKED	
2.		ONLINE	
3.	On cabinet models, close the printer cover. The printer is ready for operation. All parameters are effective as long as the printer is on. When you turn off the printer, the parameters will be erased from memory.		

Saving Your New Configuration



A configuration must be saved in order to load it later. You can save up to eight configurations to meet different print job requirements. For example:

Config 1: Selects Standard density, 10 CPI, 6 LPI, 11-inch forms

Config 2: Selects Sparse density, 10 CPI, 8 LPI, 8-inch forms

The configurations are saved and stored in memory; they will not be lost if you power off the printer. Later, you can load one of the configurations for a specific print job. This eliminates the need to change settings (LPI, forms length etc.) for each new job. See page 36 about loading configurations. You may want to print your configurations (page 34) and store them in a safe place, such as inside the printer cabinet.

If you are going to change and save parameters for both the PCL-II and LinePrinter Plus emulations, remember to save the changes for the PCL-II emulation before you select LP Plus as the active emulation (page 49) or vice versa. Once you change active emulations, any changes to the previously selected emulation will be erased unless they have been saved.

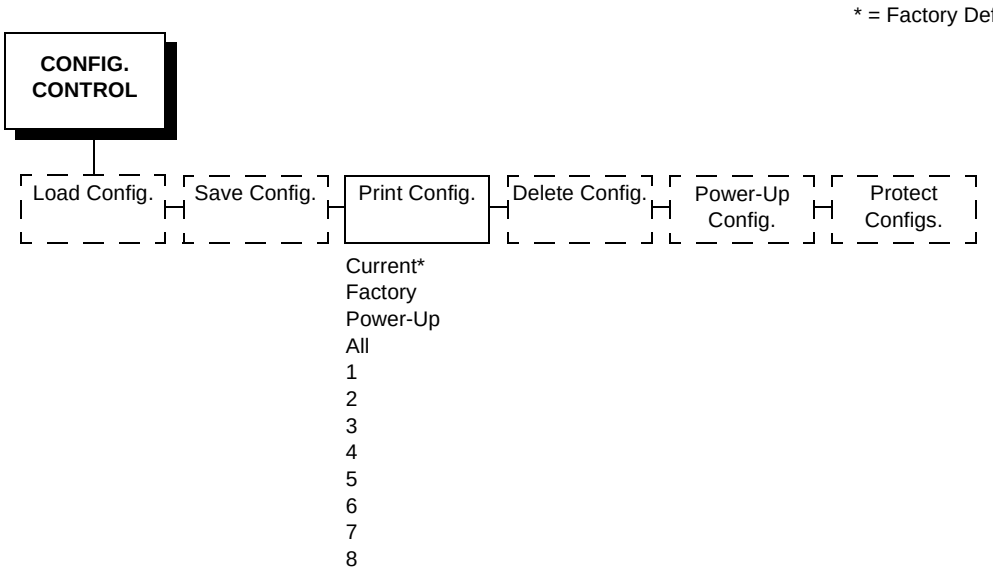
If you do not save your configuration before you turn off the printer, all of the new parameters will be erased. When you turn the printer on again, the power-up configuration will load. If no configurations have been designated as the power-up configuration, the factory configuration will load.

If the Protect Configs. parameter is enabled, the new configuration will not be saved unless the existing configuration has been deleted. See page 42 for details.

Table 3. Saving Configurations

Step	Key	Result	Notes
1.	If you are already in the configuration menu, go to step 5.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	
3.	+	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.		CONFIG. CONTROL Load Config.	
5.	UNTIL	CONFIG. CONTROL Save Config.	
6.		Save Config. 1*	
7.	OR	Save Config. 2	Press until the desired number (1-8) displays.
NOTE:	Do not turn off the printer while save is in progress because you might lose your configuration.		
8.	ENTER	Save Config. 2*	The configuration is now saved in memory. (In this case, config. 2.)
9.	UNTIL	CONFIG. CONTROL Save Config.	
NOTE:	It is recommended you print the configuration. Go to page 35, step 5. If you decide not to print the configuration, then continue with the following steps.		
10.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
11.	ON LINE	ONLINE	
12.	Close the printer cover. The printer is ready for operation.		

Printing the Current Configuration



The configuration printout lists the stored parameters. You can print any or all of the configurations shown above. Configurations 1-8 are the customized configurations.

To print a configuration, follow the procedure in Table 4.

Note

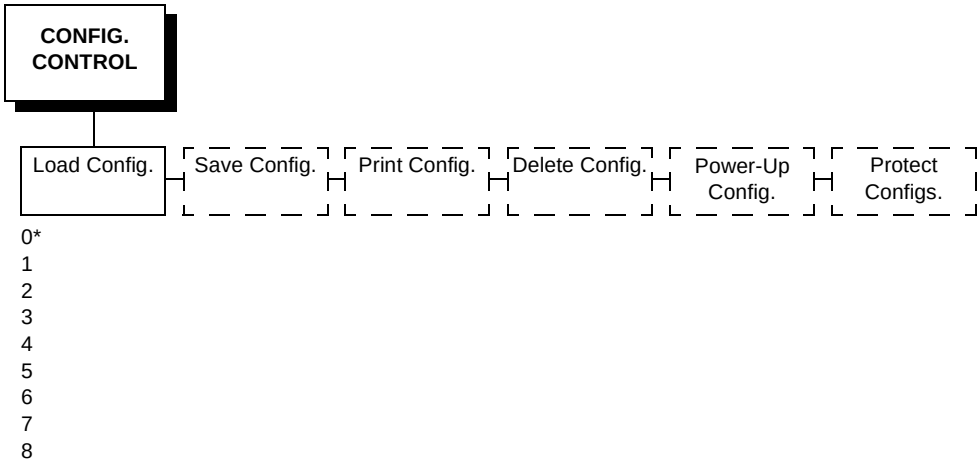
It is recommended you print all of the configurations and store them in a safe place, such as inside the printer cabinet, for future reference.

Table 4. Printing Configurations

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	
3.	+	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.		CONFIG. CONTROL Load Config.	
5.	UNTIL	CONFIG. CONTROL Print Config.	
6.		Print Config. Current*	
7.	OR	Print Config. All	Press until the desired option displays.
8.	ENTER	OFFLINE CONFIG. CONTROL	The configuration listing begins printing.
9.	Carefully tear off the configuration printout.		
10.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
11.	ON LINE	ONLINE	
12.	Close the printer cover. Store the printout in a safe place. The printer is ready for operation.		

Loading Configuration Values

* = Factory Default



You can load any of the eight customized configurations or the factory default configuration, Configuration 0. Its list of parameters begins on page 28.

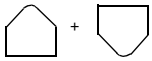
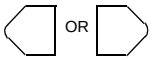
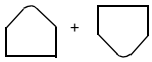
The loaded configuration remains active as long as the printer is on. If you power off the printer, the power-up configuration will load when power is turned back on. Any of the eight customized configurations can be designated as the power-up configuration.

The procedure in Table 6 on explains how to select the power-up configuration. If you do not set a power-up configuration, the factory default configuration will load if you power the printer off and then back on.

Note

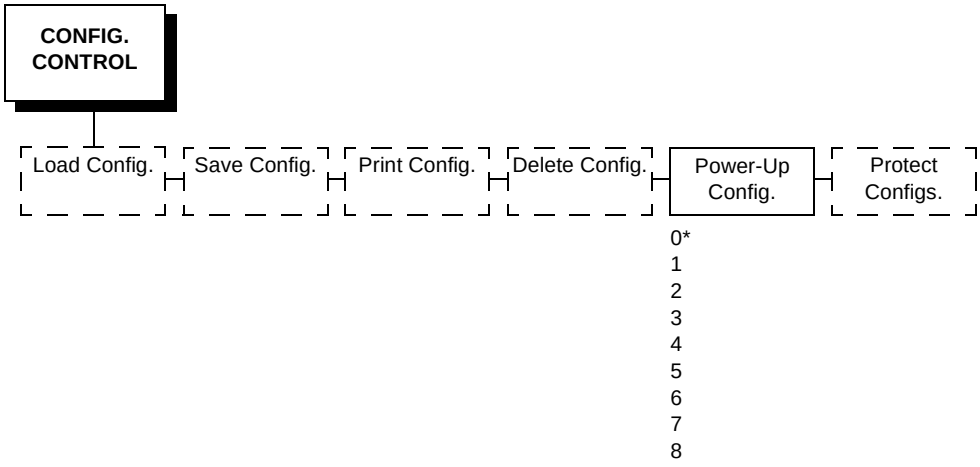
A configuration must be saved first in order to load it.

Table 5. Loading Configurations

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	
3.		ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.		CONFIG. CONTROL Load Config.	
5.		Load Config. 1*	
6.		Load Config. 4	Press until the desired number (1-8) displays.
7.	ENTER	Loading Saved Configuration	Displays for about a second.
		Load Config. 4*	The printer has loaded the configuration.
8.		ENTER SWITCH LOCKED	Locks the ENTER key.
9.	ON LINE	ONLINE	
10.	Close the printer cover. The printer is ready for operation.		

The Power-Up Configuration

* = Factory Default



When you power on the printer for the first time, it loads configuration 0, the factory default configuration.

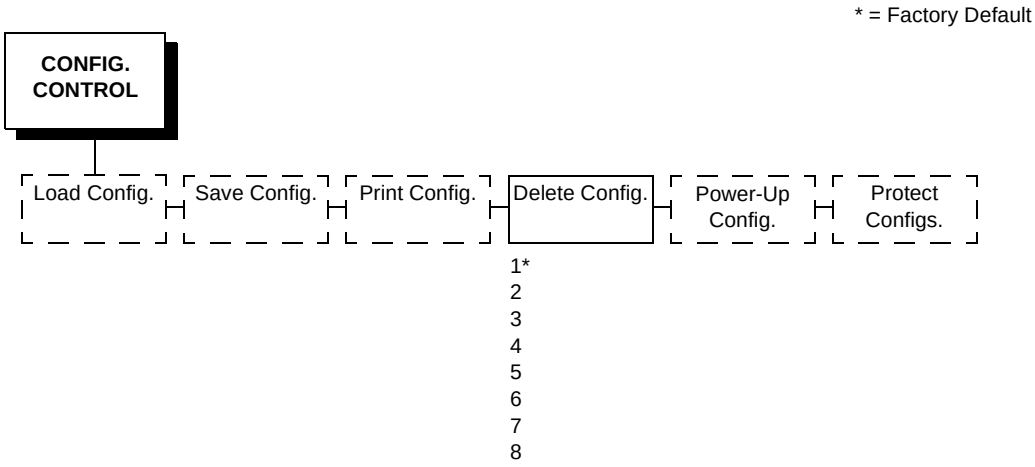
If you save a configuration, such as configuration 1, and turn the power off and then back on, the printer will load the designated power-up configuration, not the last saved configuration.

For your convenience, you can specify which configuration (0-8) should be the power-up configuration.

Table 6. Setting The Power-Up Configuration

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	
3.	+	ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.		CONFIG. CONTROL Load Config.	
5.	UNTIL	CONFIG. CONTROL Power-Up Config.	
6.		Power-Up Config. 0*	
7.	OR	Power-Up Config. 6	Press until the desired number (1-8) displays.
8.	ENTER	Power-Up Config. 6*	The printer has selected the desired configuration.
9.	+	ENTER SWITCH LOCKED	Locks the ENTER key.
10.	ON LINE	ONLINE	
11.	Close the printer cover. The printer is ready for operation.		

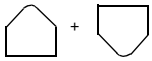
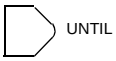
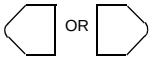
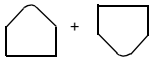
Deleting Configurations



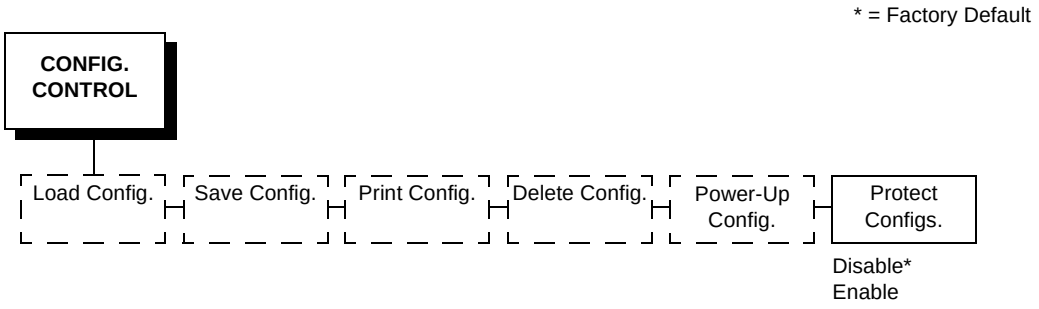
You can delete any of your customized configurations. You cannot, however, delete the configuration 0, which is the factory preset configuration.

The Protect Configs. parameter must be set to disable before you may delete a configuration (see page 42). Once you delete a configuration the Protect Configs. parameter automatically returns to enable.

Table 7. Deleting Configurations

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	
3.		ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.		CONFIG. CONTROL Load Config.	
5.		CONFIG. CONTROL Delete Config.	
6.		Delete Config. 1*	
7.		Delete Config. 3	Press until the desired number (1-8) displays.
8.	ENTER	Deleting Configuration	The printer has deleted the selected configuration.
		Delete Config. 3*	
9.		ENTER SWITCH LOCKED	Locks the ENTER key.
10.	ON LINE	ONLINE	
11.	Close the printer cover. The printer is ready for operation.		

Protecting Your Configurations



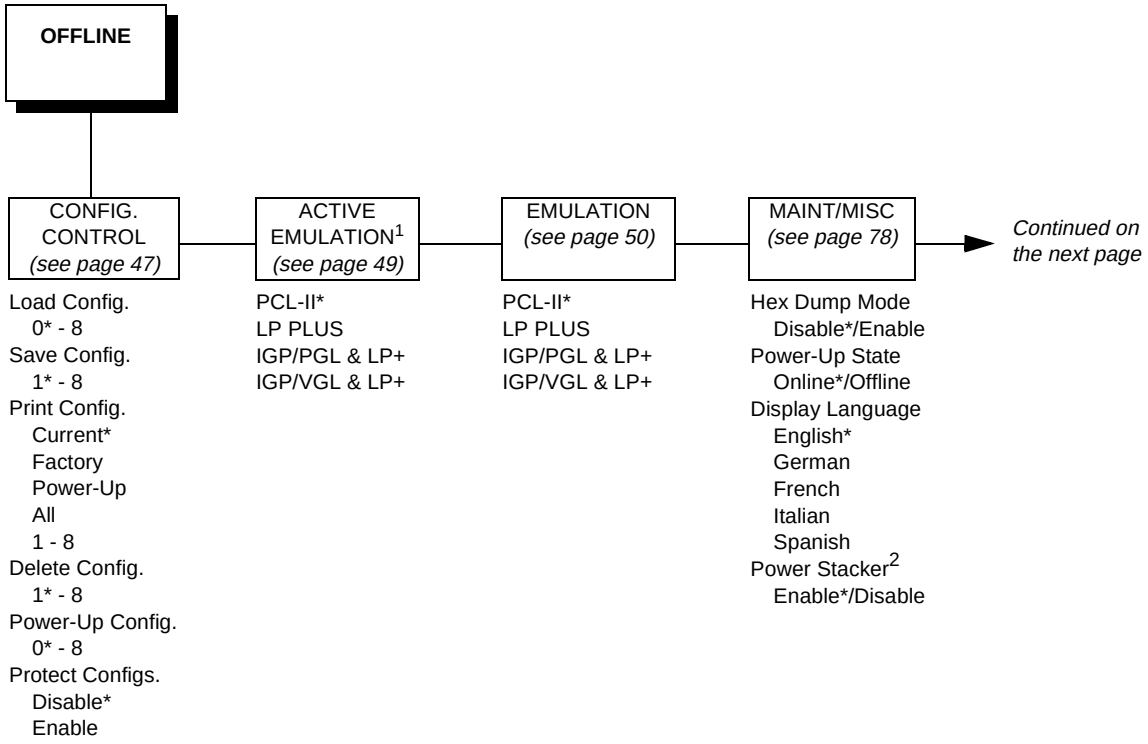
In order to save or delete a configuration you must set the Protect Configs. option to disable. The Protect Configs. selection will automatically return to enable once a configuration is saved or deleted.

3 *The Configuration Menus*

Overview

Once you have familiarized yourself with the configuration process using the tutorial information in Chapter 2, you are ready to complete your configuration of the printer.

This chapter provides descriptions for each parameter provided by the configuration menus. Figure 6 shows the configuration main menu and its first level parameters. The remainder of this chapter includes illustrations of many additional submenus and parameters nested beneath each of the main menu options.



NOTES:

[1] Choices available are limited to the emulations configured with the printer.

[2] Appears only if the power stacker option is installed.

Figure 6. Configuration Menu Overview

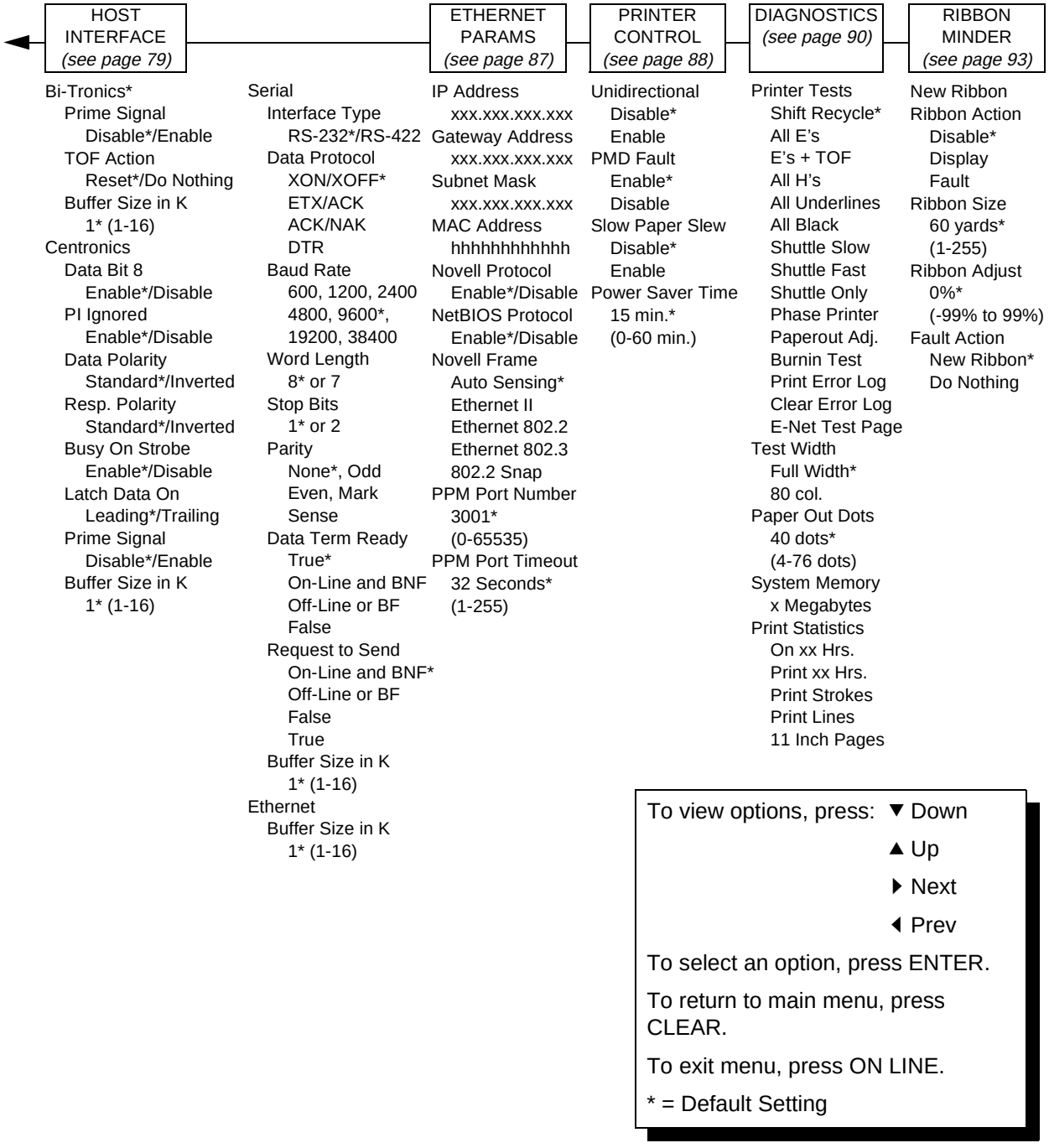


Figure 6. Configuration Menu Overview (continued)

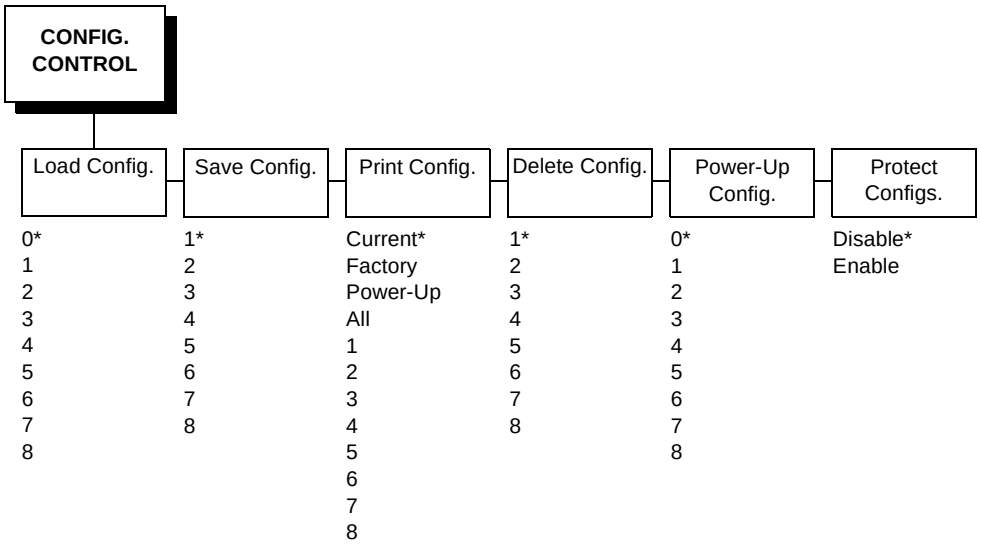
Configuration Main Menu

Brief descriptions follow for the first-level configuration menu options:

- **CONFIG. CONTROL.** These options allow you to save, print, load, and delete entire sets of configuration parameters. These options are described briefly in this chapter, and covered in detail in Chapter 2.
- **ACTIVE EMULATION.** You can select either Hewlett-Packard's Printer Control Language (PCL-II) or LP Plus.
  If you select PCL-II, you can select the optional IGP®/PGL® or IGP/VGL (Code V) emulations, if installed.
  If you select LP Plus, you can select Epson FX, Proprinter XL, or P-Series.
- **EMULATION.** If PCL-II is the active emulation, PCL-II will display and you can select its parameters for configuration.
  If the optional IGP/PGL or Code V emulations are installed, you can access their configuration parameters.
  If LP Plus is the active emulation, Epson FX, Proprinter XL, and P-Series configuration parameters are available.
- **MAINT / MISC.** These options provide miscellaneous functions, such as printing a hex dump, selecting a display language, and choosing whether the printer will power up offline or online.
- **HOST INTERFACE.** These options allow you to select the printer interface depending on what type of interface cabling you installed while setting up your printer. In addition to selecting an active interface, this menu also allows you to configure several parameters for each interface.
- **ETHERNET PARAMS.** This option allows you to view and change the IP Address, Gateway Address, and Subnet Mask. The MAC Address may also be viewed. In addition, Novell and Printer Manager options can be set.
- **PRINTER CONTROL.** These options allow you to select several operating parameters for the printer, such as the speed at which paper will advance when FF (Form Feed) is pressed.
- **DIAGNOSTICS.** These options include the printer's diagnostic tests, system memory, and print statistics.
- **RIBBONMINDER.** The options in this submenu allow you to enable the RibbonMinder™ feature and set its parameters.

CONFIG. CONTROL

Menu



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

The CONFIG. CONTROL menu manages configurations, which are groupings of parameter values that can be stored in printer memory. Brief descriptions follow for each option.

Load Config.

The printer can store up to eight unique configurations in memory. This parameter allows you to select and load a specific configuration.

Configuration 0 is the factory default; its parameters cannot be changed. It is always available for loading. A fuller description and sample procedure for using this option appears on page 36.

Save Config.

This option allows you to save up to eight unique configurations to meet different print job requirements. This eliminates the need to change the parameter settings for each new job.

The configurations are stored in memory. They will not be lost if you turn off the printer. Configuration 0 is a factory-preset configuration, which can not be changed or saved. See page 32 for a fuller description and sample procedure.

Note

If the Protect Configs. parameter is enabled, the new configuration will not be saved unless the existing configuration has been deleted.

Print Config.

This option is used to print a listing of stored printer configurations. It is recommended you store the configurations in a safe place for quick referral, such as inside the printer if you have a cabinet model. A fuller description and sample procedure is provided on page 34.

Delete Config.

You can delete one or all of your eight customized configurations. Configuration 0 is a factory-preset configuration and cannot be changed or deleted.

Power-Up Config.

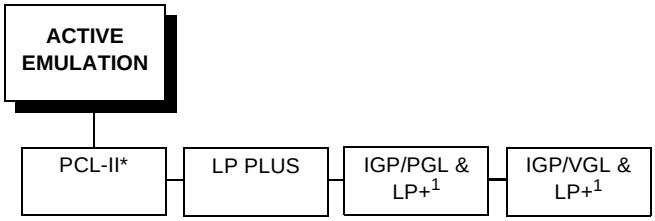
You can specify which of the nine configurations (0-8) will be the power-up configuration. The factory default for power-up is configuration 0. See page 38 for a fuller description and sample procedure.

Protect Configs.

You can specify whether or not a new configuration should overwrite an existing configuration when you activate the Save Config. parameter.

- **Disable.** The default. The new configuration will overwrite the existing configuration.
- **Enable.** The new configuration will not overwrite the existing configuration, and the message “CONFIG. EXISTS / Delete First” displays. You must delete the existing configuration (1-8) before trying to save the new configuration.

ACTIVE EMULATION



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

[1] = if installed

The ACTIVE EMULATION menu determines what emulations are available.

- **PCL-II.** The default. The PCL-II emulation is active.
- **LP PLUS.** This option selects LinePrinter Plus as the active emulation. If LP PLUS is the active emulation, you can select Epson, Proprinter III XL, or P-Series as the printer protocol (see page 55).
- **IGP/PGL & LP+ and IGP/VGL & LP+.** The ACTIVE EMULATION function also allows you to activate either the PGL or the Code V emulation. There are two methods for selecting the desired emulation. The first is by selecting the emulation directly from the printer menu. The second is by sending a host command which will switch the emulation automatically. See the appropriate *Technical Reference Manual* for more information on these command codes.

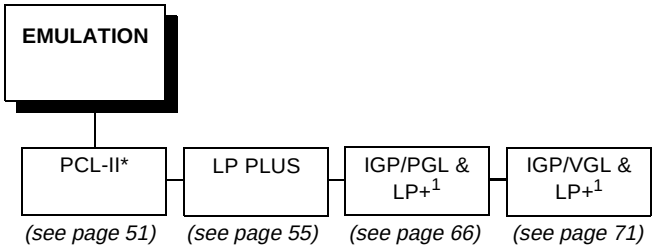
  When changing from one IGP emulation to the other, the printer will load the power-up configuration. Thus, any setting performed before selecting those interfaces and not saved in flash memory will be lost.

  For more information on IGP/PGL and Code V, see the appropriate *Technical Reference Manual.*

Note

In order to configure an IGP emulation, the IGP emulation must be selected in the ACTIVE EMULATION menu. The IGP emulation that is not selected will not appear in the EMULATION menu.

EMULATION



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

[1] = if installed

The EMULATION menu is the gateway to configure the emulations available with the LineJet printer. The control codes for each of these emulations are described in their respective *Technical Reference Manuals*.

PCL-II Emulation

Hewlett-Packard's Printer Control Language that is compatible with Hewlett-Packard systems.

LP PLUS Emulations

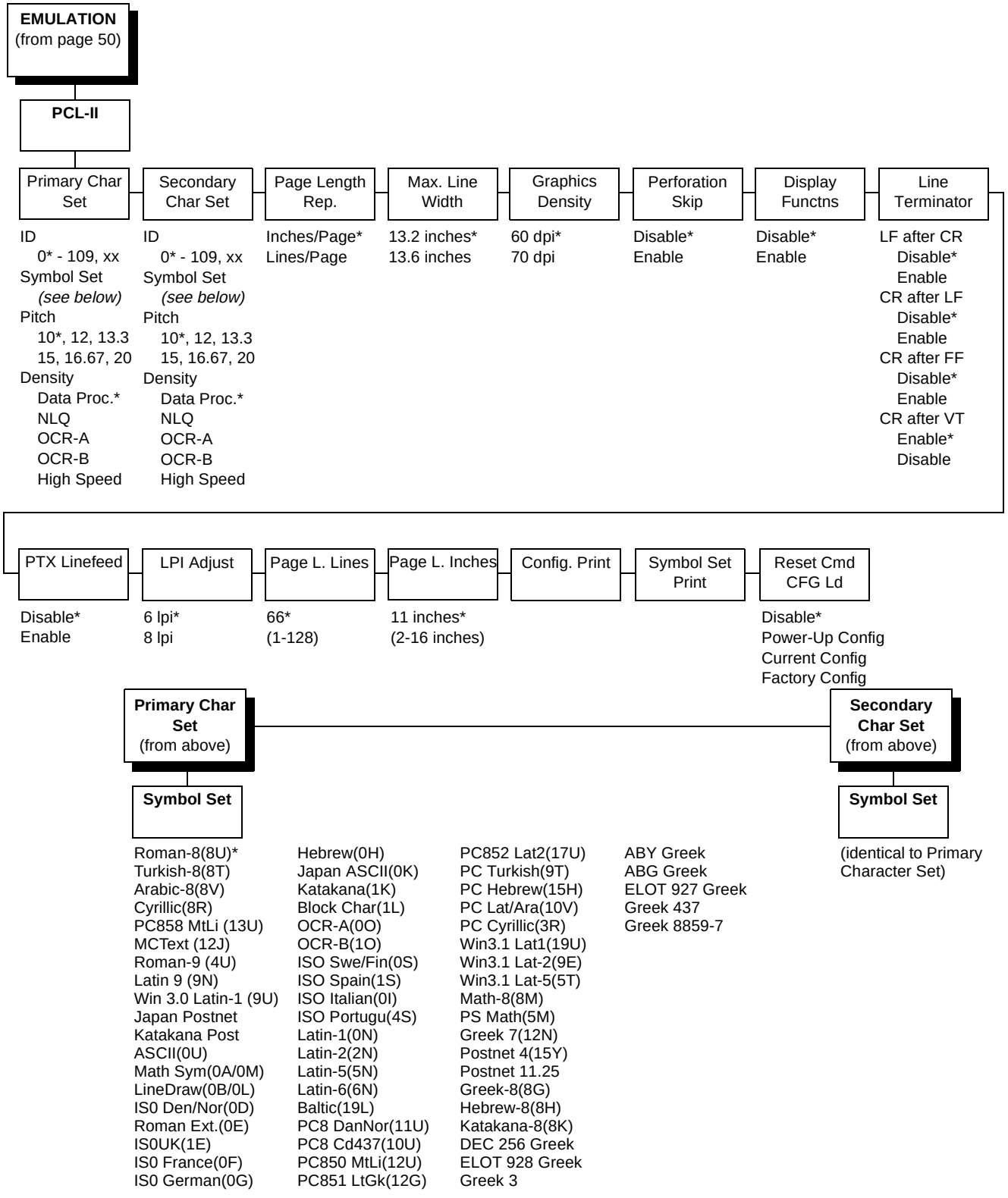
- **Epson FX.** This LP Plus emulation is provided for compatibility with the Epson FX-1050 printer control language.
- **Proprinter XL.** This LP Plus emulation is provided for compatibility with the IBM Proprinter III XL printer control language.
- **P-Series.** This is the Printronix P-Series printer control language, provided as part of LP Plus.

Optional Emulations

IGP/VGL (Code V) and IGP/PGL are optional graphics emulations. They can be selected and configured only if you have purchased these options. PCL-II must be the active emulation for Code V or IGP/PGL to operate.

PCL-II Submenu

* = Factory Default



Primary Character Set

You can select one of 92 pre-defined character sets by ID (although character sets range from 0 - 109, not all sets are available on the LineJet printer), or you can select pitch, symbol set, and typeface individually. If the combination you choose matches one of the 92 predefined sets, the ID submenu will reflect that selection. If not, the ID menu will display “xx” to indicate that the current character set does not match a pre-defined set. Set 0 is the default and its attributes are 10 cpi, Data Processing typeface, and Roman 8 symbol set.

Secondary Character Set

Your printer can store an additional character set. To toggle between them, send the Shift In (Decimal 15, to select the Primary character set) or Shift Out (Decimal 14, to select the Secondary character set).

Page Length Representation

- **Inches/Page.** All page length calculations are based on the inches displayed on the panel.
- **Lines/Page.** All changes in LPI or density will be changed accordingly. The length of the page is the number of lines per inch, or lpi.

  For example, if the form in use is 82 lines at 6 lpi, the page is physically 13.67 inches. Since 13.67 inches is not selectable from the Length in Inches menu, change the representation to lines, then set the number of lines to 82. The inches menu will display 13.6 inches although the printer internally keeps the exact form length of 13.67 inches.

Max. Line Width

Set the maximum line width at 13.2 inches (the default) or 13.6 inches.

Graphics Density

Graphics can be printed in 60 DPI (the default) or 70 DPI.

Perforation Skip

- **Disable**. Allows printing on page perforation.
- **Enable.** You may set up a skip-over margin. For example, a skip-over margin of 1 inch allows a 1 inch margin at the bottom of the page.

Display Functions

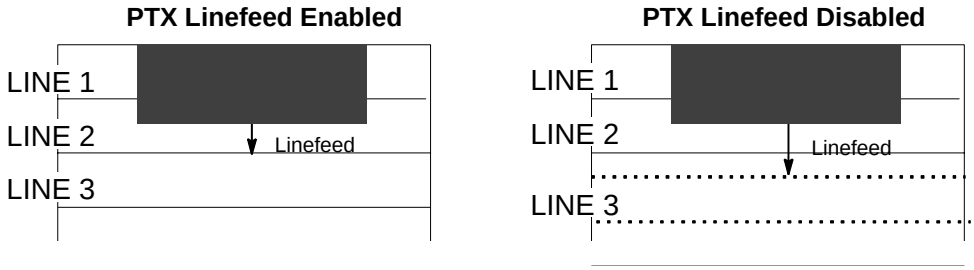
- **Disable.** The default. Control characters are not printed.
- **Enable.** Control characters are printed before they get executed. This is a useful debugging tool.

Line Terminator

You can specify what will be used to indicate the end of a line. Four options are available: LF after CR, CR after LF, CR after FF, and CR after VT. Each of these options may be Enabled or Disabled independent of one another.

PTX Linefeed

- **Disable.** The default. Linefeed is to be performed as calculated from the bottom of the graphics or barcode, thereby disrupting the vertical text alignment.
- **Enable.** The Linefeed moves to the next line as calculated from the Top of Form position, thereby retaining vertical text alignment. When printing graphics or bar codes, you may want to set the PTX Linefeed parameter to Enable to maintain text alignment.



LPI Adjust

This parameter lets you specify the lines per inch (lpi) values, 6 LPI (the default) or 8 LPI.

Page Length Adjust/Lines

This parameter lets you set physical page length from 12 to 96 at 6 lpi, or 16 to 128 at 8 cpi. The default is 66 lines at 6 lpi.

Note

If 6 lpi is selected, you will be able to scroll the menu to 128 (an invalid length). However, when you press Enter to select this value, the menu will return with the maximum lines for 6 lpi (i.e. 96 lines). Similarly, selecting too few lines for 8 lpi will cause the menu to return with 16 lines.

Page Length Adjust/Inches

This parameter lets you set physical page length from 2 to 16 inches, in increments of half an inch. The default is 11 inches.

Config. Print

This option prints the emulation's parameters and the currently selected values.

Symbol Set Print

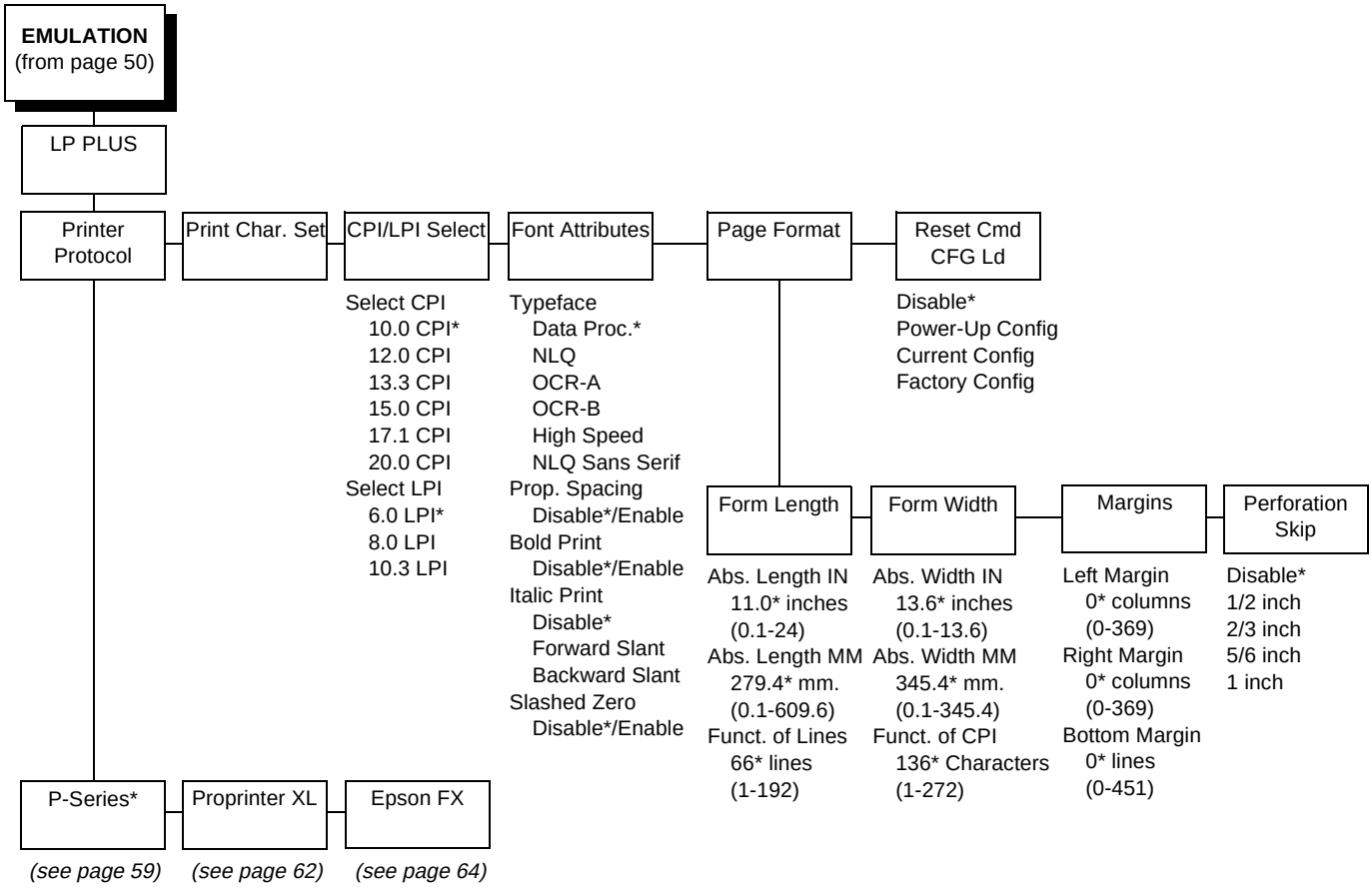
This option prints a list of all the available sets. The character set number prints to the left of the character set sample.

Reset Cmd CFG Ld

When the printer receives a host data stream reset command (ESC @ or ESC[K) in addition to resetting printer variables, the selected configuration will be loaded.

- **Disable**. The factory configuration is loaded when the reset command is executed.
- **Power-Up Config**. The power-up configuration is loaded when the reset command is executed.
- **Current Config**. The currently selected configuration is loaded when the reset command is executed.
- **Factory Config**. The factory installed configuration is loaded when the reset command is executed.

LinePrinter+



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

Printer Protocol

Select the LinePrinter+ protocol you wish to use. Refer to the *PCL-II/ LinePrinter Plus Technical Reference Manual* for more information.

Print Char Set

When this selection is displayed and the ENTER key is pressed, the current character set is printed.

CPI/LPI Select

This parameter lets you specify the characters per inch (cpi) and lines per inch (lpi) values.

Font Attributes

Typefaces

- **Data Processing**. A general purpose font printing out at 120 dpi horizontally and 72 dpi vertically. The width of the font will vary with each cpi.
- **NLQ**. A high quality font printing at 180 dpi horizontally and 96 dpi vertically. This font has serifs and the width of the font varies with the cpi.
- **OCR-A / OCR-B**. Optical character recognition fonts printing at 120 dpi horizontally and 144 dpi vertically. Both fonts print only at 10 cpi.
- **High Speed**. A draft quality font printing at 120 dpi horizontally and 48 dpi vertically. The width of the font varies with the cpi.
- **NLQ Sans Serif**. A high quality font printing at 180 dpi horizontally and 96 dpi vertically. This font prints without serifs. The width of the font varies with the cpi.

Proportional Spacing

Each printed character is contained inside a character cell. The width of the character cell includes the character and the space around the character.

- **Disable**. Each character cell is printed with the same width. Each column in the printed text will line up.

```
This example is printed with
proportional spacing disabled.
```

- **Enable**. The width of each character cell varies with the width of the character. For example, [i] takes less space to print than [m]. Using proportional fonts generally increases the readability of printed documents, giving text a typeset appearance.

```
This example is printed with
proportional spacing enabled.
```

Bold Print

- **Disable**. Text is printed normally.
- **Enable**. Text is printed with a heavy line thickness.

Italic Print

- **Disable**. Text is printed normally.
- **Forward Slant**. Text is printed with a forward slant.
- **Backward Slant**. Text is printed with a backward slant.

Slashed Zero

This parameter allows you to print the numeral “0” with or without the slash. This option applies to all character sets except OCR-A and OCR-B.

- **Disable**. Zero is printed without a slash.
- **Enable**. Zero is printed with a slash.

Page Format

Forms Length

Forms length is the number of lines that can be printed on a page. You can set forms length in inches, millimeters (mm) or as a function of the current LPI (lines per inch).

Forms Width

The forms width can be specified in inches, millimeters, or as a function of the current CPI (characters per inch). The forms width set should not exceed the actual paper width.

Margins

- **Right Margin**. Set in columns. Column zero is defined as the far right edge of the page, and column numbering increments from right to left.
- **Left Margin**. Set in columns. Column zero is defined as the far left edge of the page, and column numbering increments from left to right.
- **Bottom Margin**. Defined in lines, starting from line zero at the bottom of the page and incrementing from the bottom up.

Perforation Skip

- **Disable**. Allows printing on page perforation.
- You may set up a skip-over margin of 1/2 inch, 2/3 inch, 5/6 inch, or 1 inch. For example, a skip-over margin of 1 inch allows a 1 inch margin at the bottom of the page.

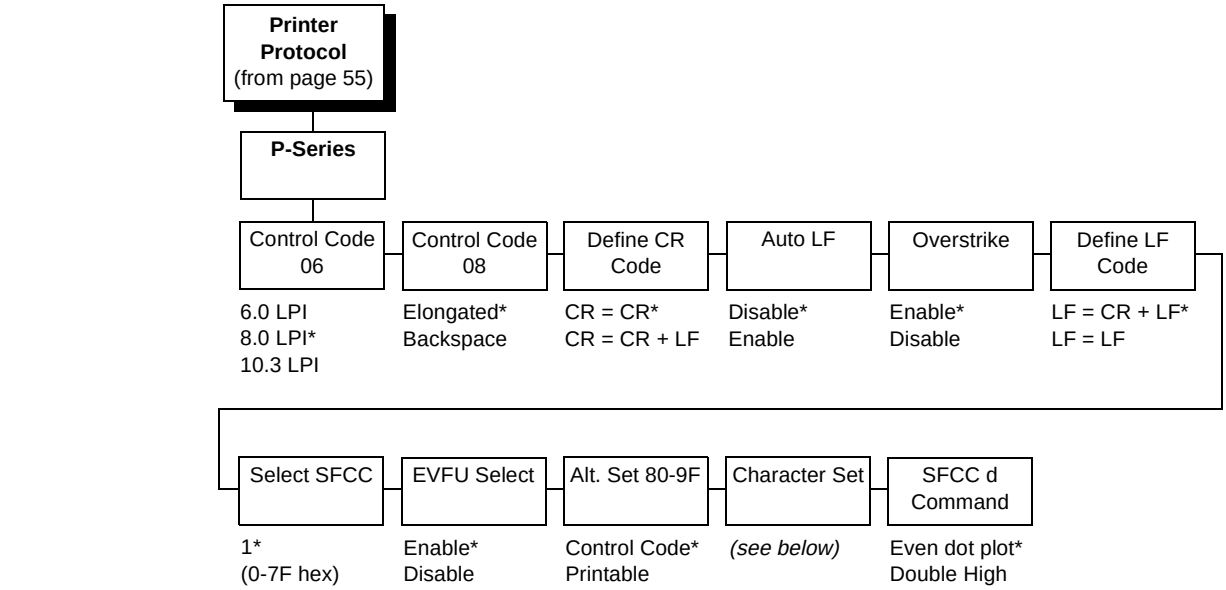
Reset Cmd CFG Ld

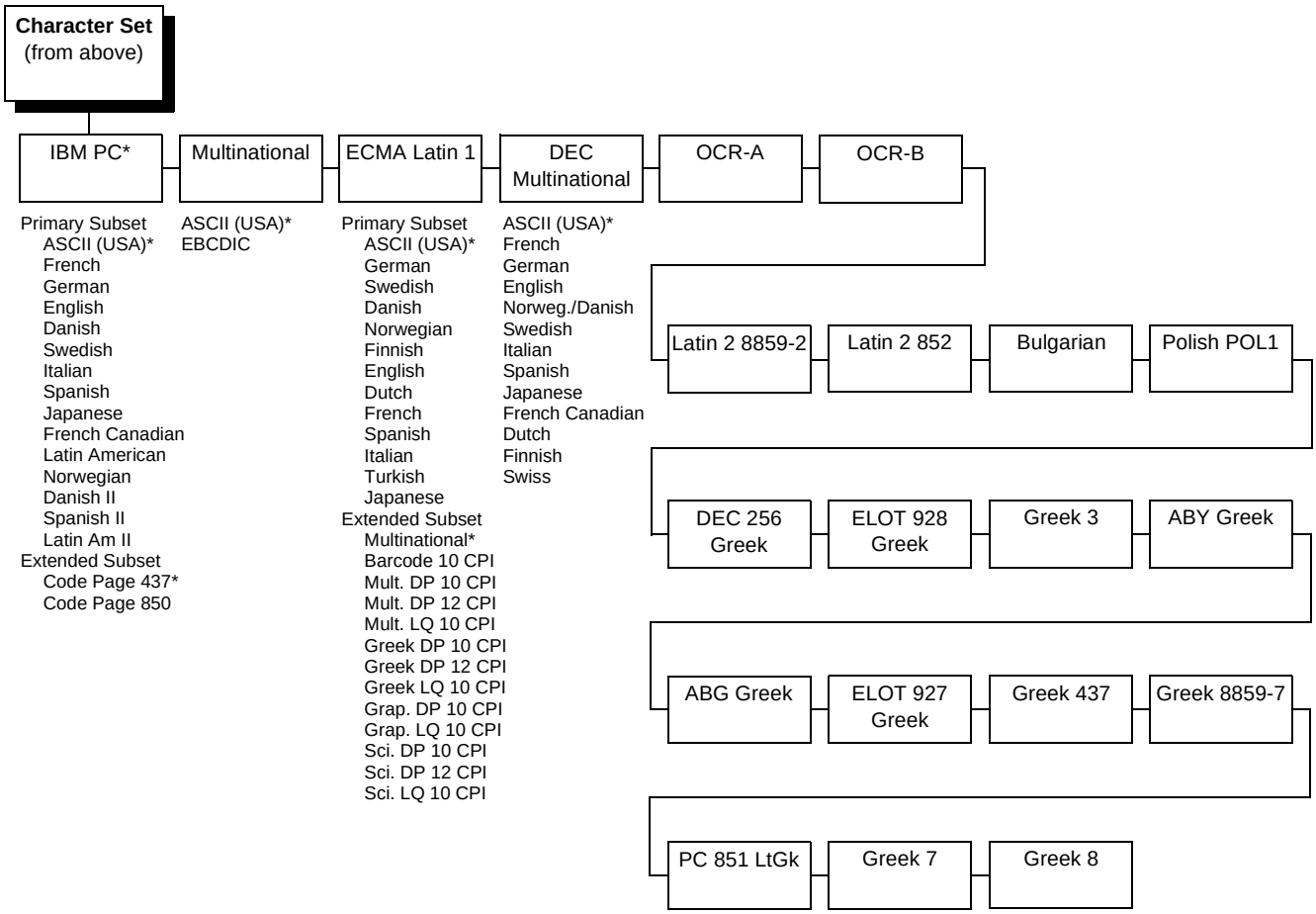
When the printer receives a host data stream reset command (ESC @ or ESC[K) in addition to resetting printer variables, the selected configuration will be loaded.

- **Disable**. The factory configuration is loaded when the reset command is executed.
- **Power-Up Config**. The power-up configuration is loaded when the reset command is executed.
- **Current Config**. The currently selected configuration is loaded when the reset command is executed.
- **Factory Config**. The factory installed configuration is loaded when the reset command is executed.

P-Series Emulation

* = Factory Default





Control Code 06

Control Code 06 defines the function of ASCII code hex 06 (ACK). You can select an alternate line spacing of 6, 8 or 10.3 LPI.

Control Code 08

Control Code 08 defines the function of ASCII code hex 08 (BS). You can define the code to output an elongated character or a backspace.

Define CR Code

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

- **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.
- **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return. The next print position will be print position 1 of the next line.

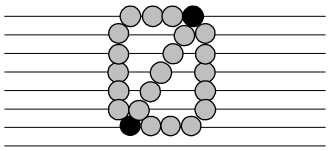
Auto LF

This option defines the printer action when print data is received past the forms width setting.

- **Disable**. Discards any data past the forms width.
- **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

Overstrike

- **Enable**. Common dots appear darker in characters printed over each other, as shown below. The print position moves one-half dot to the right. Overstrike printing occurs at a decreased speed.
- **Disable**. If you are using a control code for overstrike, but it is disabled in the printer control panel, no bolding will occur.



Define LF Code

- **LF = CR + LF**. Forces an automatic carriage return with each line feed command. The next print position is print position 1 of the next line.
- **LF = LF**. Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

Select SFCC

This parameter allows you to select which ASCII codes will function as the Special Function Control Code (SFCC) command delimiter.
P-Series codes can use hex 00 through hex 7F. Options include the following:

- ESC (hex 1B)
- SOH (hex 01)
- ETX (hex 03)
- CIRCUMFLEX (hex 5E)—also called caret (^)
- TILDE (hex 7E)—(~)

Note

SOH, ETX and ESC are non-printables. The characters (^) and (~) are printable; however, do not use them as printables in the host data stream if either is chosen as a delimiter, or print errors will occur.

EVFU Select

Controls how the printer handles vertical formatting.

- **Enable**. Enables the VFU and selects P-Series compatible Electronic Vertical Format Unit (EVFU).
- **Disable**. Disables VFU processing.

Alt. Set 80-9F

Determines whether the printer processes ASCII codes hex 80 through hex 9F as control codes or as printable characters.

Character Set

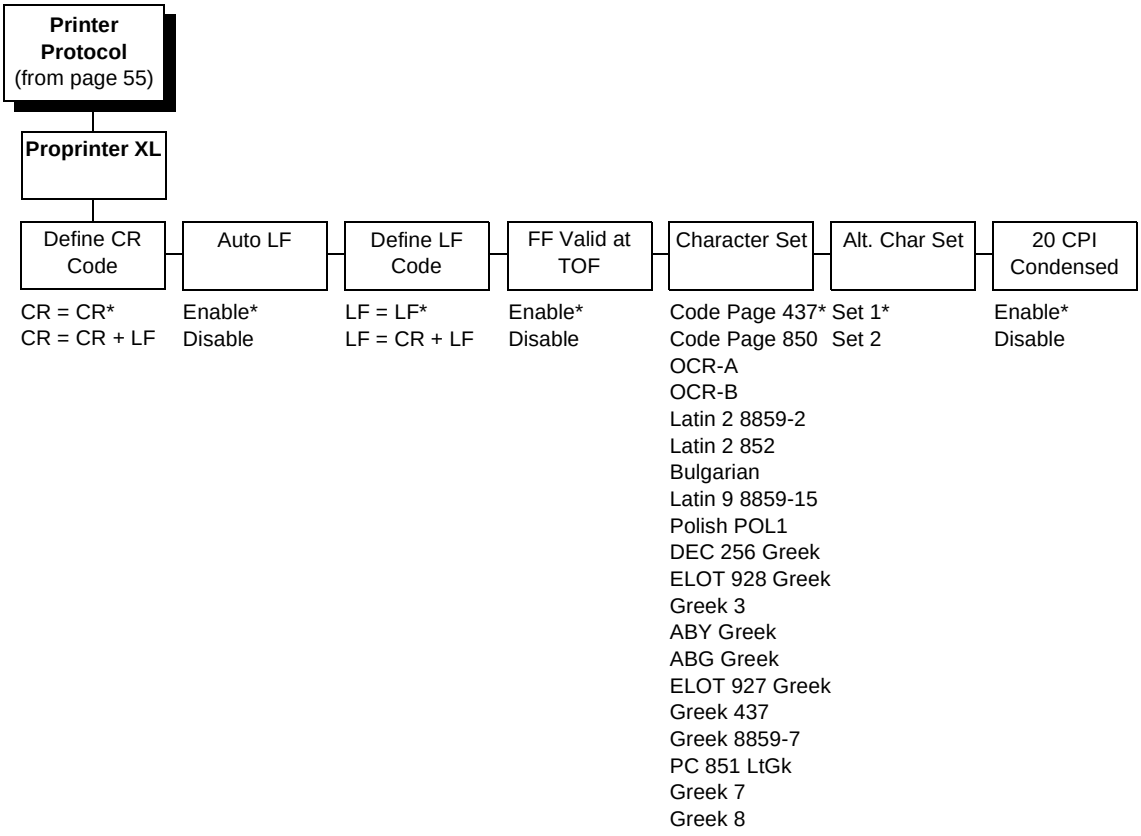
Specifies a character set as shown in the character set menu. To use one of these sets, choose the desired group heading (such as Multinational) and press ENTER. Then choose the desired set within that group (such as EBCDIC) and press ENTER. Both the group and the desired set will be starred to indicate your selection.

SFCC d Command

- **Even dot plot**. This option interprets SFCC d Command as even dot plot.
- **Double high**. This option interprets SFCC d Command as double high. Select this option for backward compatibility.

Proprinter XL Emulation

* = Factory Default



Define CR Code

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

- **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.
- **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

- **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.
- **Disable**. Discards any data past the forms width.

Define LF Code

- **LF = LF**. Does not perform an automatic carriage return when a line feed command is received. The next print position will be the current print position of the next line.
- **LF = CR + LF**. Forces an automatic carriage return with each line feed command received. The next print position is print position 1 of the next line.

FF Valid at TOF

- **Enable**. Performs a form feed when the host sends a Form Feed command and the printer is at the top of form.
- **Disable**. Will not perform a form feed when the host sends a Form Feed command and the printer is at the top of form.

Character Set

Specifies a character set as shown in the menu. To use one of these sets, choose the desired character set and press ENTER. The desired set will be starred to indicate your selection.

Alternate Char Set

This option determines if data in the range of hex 80 through hex 9F should be interpreted as a control code or as a printable character.

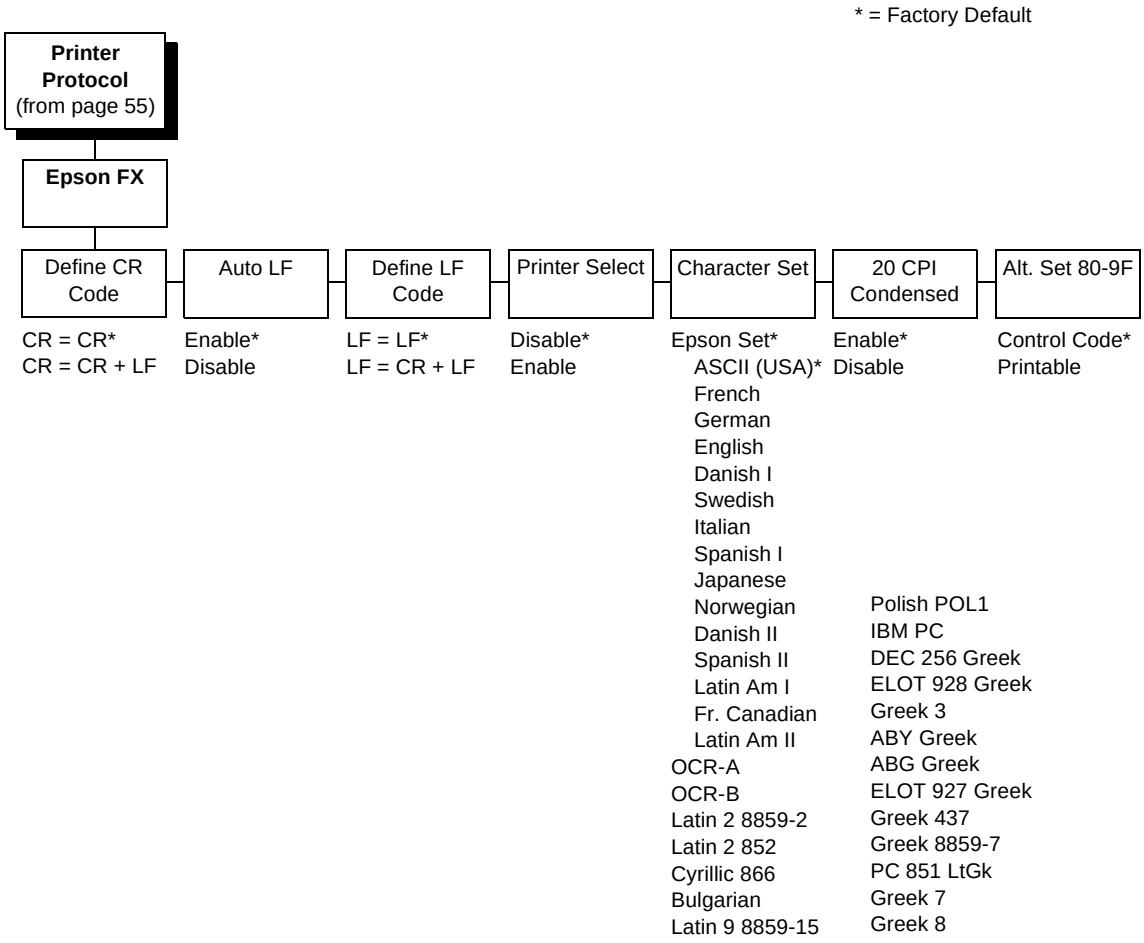
- **Set 1**. Interprets data in the range of hex 80 through hex 9F as a control code.
- **Set 2**. Prints data for the characters at hex locations 03, 04, 05, 06, 15 and 80 through 9F.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

- **Enable**. Prints characters about 60 percent the width of normal characters when compressed print is chosen by the host computer.
- **Disable**. Does not compress print widths, even if condensed print is chosen by the host.

Epson FX Emulation



Define CR Code

The Define CR Code option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

- **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.
- **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

- **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.
- **Disable**. Discards any data past the forms width.

Define LF Code

The Define LF Code option controls the action of the printer when it receives a Line Feed code (hex 0A) from the host computer. If this feature is enabled, each time the printer receives a Line Feed, it inserts an additional Carriage Return code (hex 0D) into the data stream. This feature is required if the host computer does not send Carriage Returns to the printer.

- **LF = LF**. Does not add a Carriage Return with a Line Feed.
- **LF = CR + LF**. Adds an extra Carriage Return with each Line Feed.

Printer Select

- **Disable**. Ignores the ASCII DC1 and DC3 control codes.
- **Enable**. Disables the printer when a DC1 control code is received, and enables the printer when a DC3 control code is received.

Character Set

This parameter selects a character set for the Epson emulation, as shown in the Character Set menu. Note that when OCR-A or OCR-B is selected as the print language, the Font Attribute Typeface option under the LinePrinter Plus menu (page 55) is changed to OCR-A or OCR-B, respectively.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

- **Enable**. Prints about 60 percent of the width of normal characters when compressed print is chosen by the host computer. For example, a 12 CPI Draft font will compress to 20 CPI.
- **Disable**. Does not compress print widths, even if condensed print is chosen by the host.

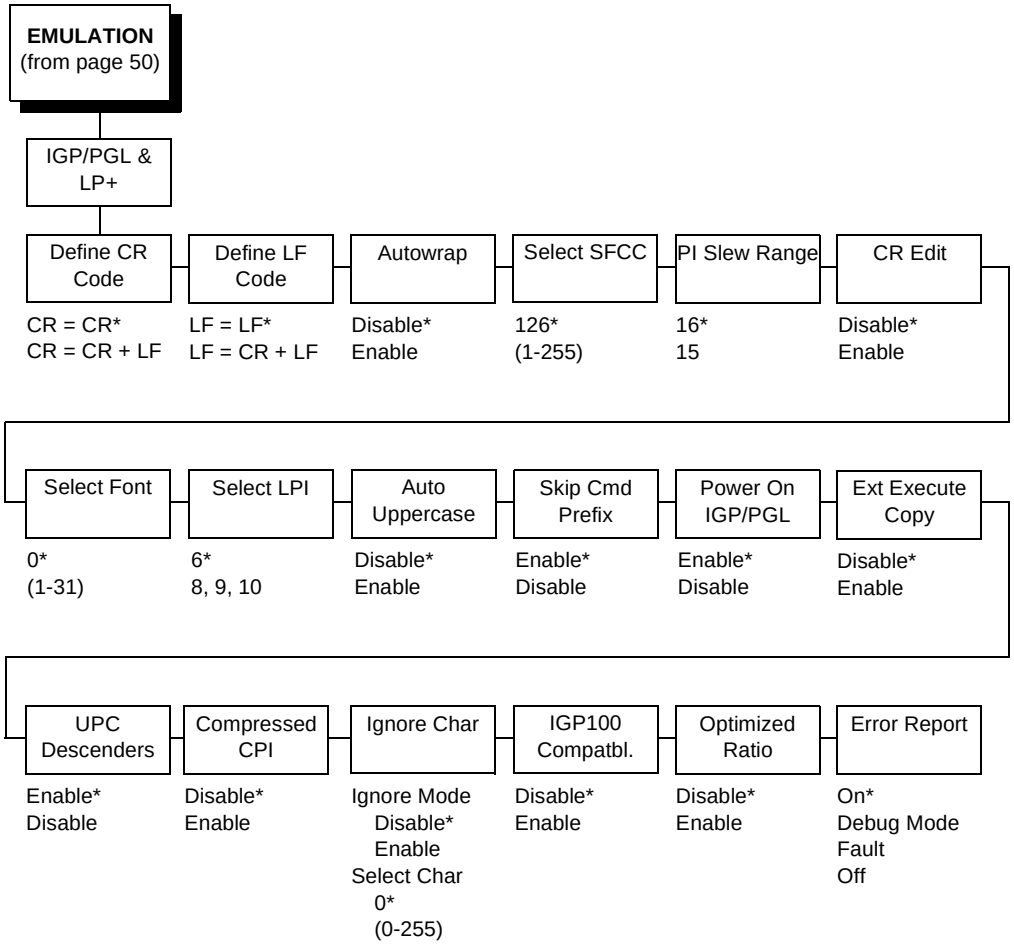
Alternate Set 80-9F

- **Control Code**. Interprets data in the range of hex 80 through hex 9F as a control code.
- **Printable**. Prints data in the range of hex 80 through hex 9F.

IGP/PGL Emulation

The IGP/PGL emulation can be configured either through the printer's front panel or from the host computer with control codes. For a detailed description of configuration with control codes, see the *IGP/PGL Technical Reference Manual.* For information on configuring the emulation through the printer's front panel, see the submenu below and the parameter descriptions that follow.

* = Factory Default



Define CR Code (Carriage Return)

This parameter forces the printer to insert an automatic Line Feed code into the data stream whenever a Carriage Return code occurs. This is to be used only if the host computer does not send Line Feeds to the printer.

- **CR = CR.** Does not perform a line feed. The next print position will be print position 1 of the current line.
- **CR = CR + LF.** Performs an automatic line feed. The next print position will be print position 1 of the next line.

Define LF Code (Line Feed)

This parameter forces the printer to insert an automatic Carriage Return code into the data stream whenever a Line Feed code occurs. This can be used in most installations, but it is required if the host computer does not send Carriage Returns to the printer.

- **LF = LF.** Does not perform an automatic carriage return. The next print position will be the current print position of the next line.
- **LF = CR + LF.** Performs an automatic carriage return. The next print position will be print position 1 of the next line.

Autowrap

This parameter determines if text will wrap to the next line when the line of text exceeds the right margin.

- **Disable.** Truncates the text beyond the right margin until a CR or CR + LF is received.
- **Enable.** Automatically inserts a CR + LF after a full print line.

Select SFCC

You can specify which decimal code (1-255) will be used as the Special Function Control Code (SFCC). The factory default setting is 126. The SFCC denotes that the following data is a PGL command.

PI Slew Range

You can specify how many lines the paper will feed.

- **16.** A paper slew of 0-15 will move 1-16 lines.
- **15.** A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will move 1 line.

CR Edit

This parameter determines if a carriage return will be followed by a line feed.

- **Disable**. The printer ignores all carriage returns that are not followed by line feeds.
- **Enable**. The printer processes all carriage returns, even for those that are not followed by line feeds.

Select Font

This parameter allows you to select a font for the IGP/PGL feature. The default is 0, which is U.S. ASCII. The following values are valid choices:

0	U.S. ASCII
1	German
2	Swedish
3	Danish
4	Norwegian
5	Finnish
6	English
7	Dutch
8	French
9	Spanish
10	Italian
11	Turkish

Values 12-23 are undefined and will default to 0. You can set values 24-31 to specific fonts; refer to the USET command in the *IGP/PGL Technical Reference Manual*.

Select LPI

This is the number of lines to be printed per inch. For example, at 6 lpi there is 1/6 inch from the top of one print line to the top of the next print line.

Auto Uppercase

This parameter enables the printer to print text in all uppercase when using the ALPHA command.

- **Disable**. The printer will print text in upper and lowercase.
- **Enable**. The printer will print text in uppercase only.

Skip Command Prefix

This parameter determines if the printer will print any data before a PGL command is received.

- **Enable**. The printer ignores all data on the current line before an IGP command.
- **Disable**. The printer will print all data on the current line before an IGP command.

Power On IGP/PGL

You can set the IGP feature so that it is enabled or disabled when the printer is powered on.

- **Enable**. The PGL is enabled when the printer is powered on. (The PGL feature is initialized in the Normal mode.)
- **Disable**. The PGL is disabled when the printer is powered on. (The PGL feature is initialized to the Quiet mode.)

Extended Execute Copy

- **Disable**. Dynamic data, overlay data, etc. are not allowed if the optional Form Count parameter (number of forms to print) is specified as part of the Execute command. (This setting is IGP-100 compatible.)
- **Enable**. Dynamic data, overlay data, etc. are allowed within a form in which the Form Count parameter is specified in the Execute command. In this case, the exact same form (with identical dynamic data) is printed for whatever the Form Count is. However, incremental data is not incremented since the page that is printing is exactly the same, the overlay data is only printed with the first form, and not on subsequent forms, and each form is printed on a separate page.

UPC Descenders

This parameter allows you to print bar code descenders when human readable data is not presented in the UPC/EAN bar codes.

- **Enable**. UPC/EAN bar codes are printed with descenders, even if there is no human readable data.
- **Disable**. UPC/EAN bar codes are printed without descenders if there is no human readable data.

Compressed CPI

This parameter allows you to choose a compressed character (60% shorter) for 17 or 20 CPI instead of the normal height character.

- **Disable**. The PGL does not use compressed 17 or 20 CPI font.
- **Enable**. Uses the standard compressed 17 or 20 CPI font.

Ignore Character

Ignore Mode

This parameter instructs the PGL to ignore the character selected under the Select Character menu.

- **Disable**. The PGL does not ignore any characters.
- **Enable**. The PGL ignores the characters specified in the Select Character menu.

Select Character

Instructs the PGL which decimal character (0-255) to ignore from the host.

IGP100 Compatbl.

This option instructs the IGP/PGL to behave similar to the IGP-100 with respect to certain commands. All new users with new applications should select the “Disable” option. Selecting this mode insures the printer will behave as described in this manual.

- **Disable.** The IGP does not emulate the IGP-100 mode.
- **Enable.** The IGP emulates the IGP-100 version.

Optimized Ratio

This option selects different bar code ratios for certain bar codes including Code 39 and Interleaved 2 of 5. It is included for compatibility with the IGP-X00 printers.

- **Disable**. Use standard bar code ratios.
- **Enable**. Select the alternate bar code ratios.

Error Report

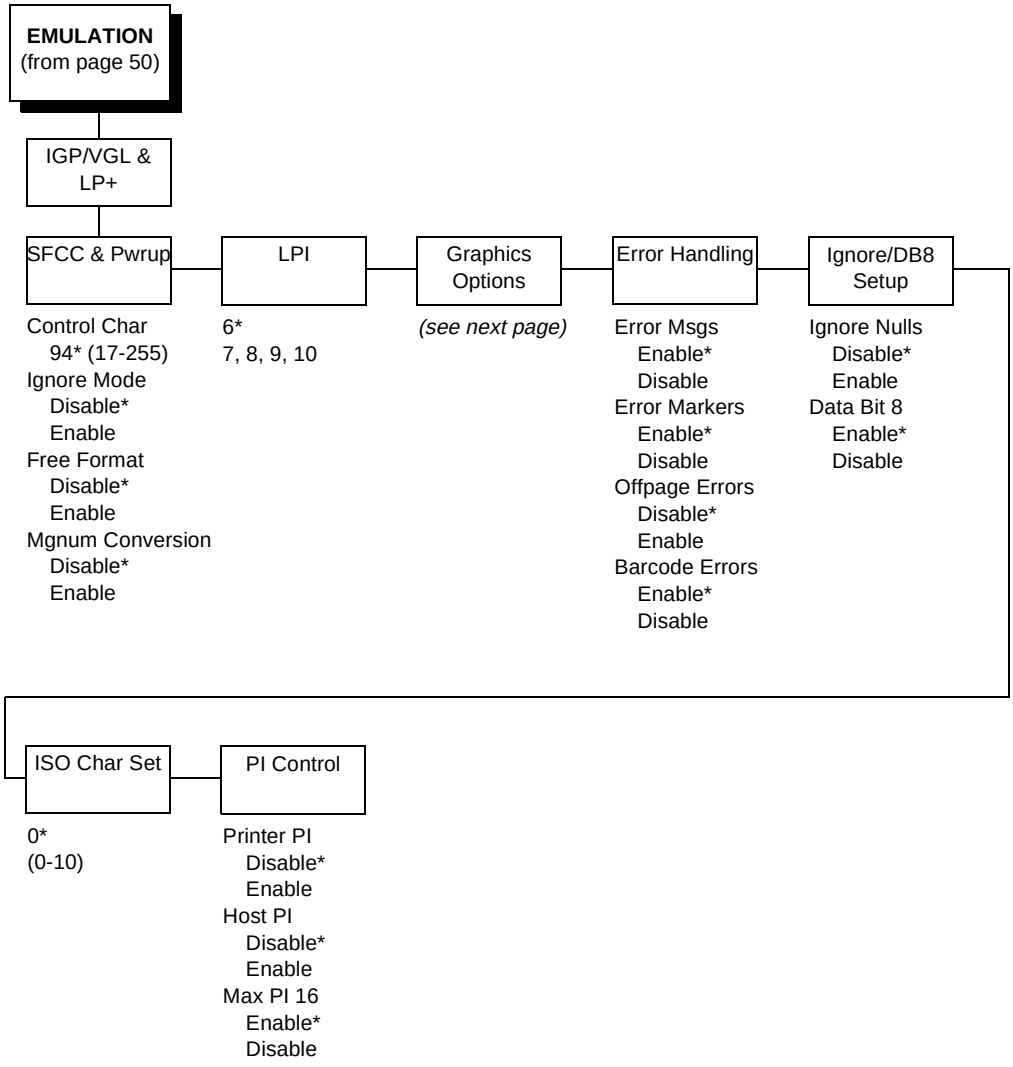
Sets the error reporting capability for IGP/PGL forms.

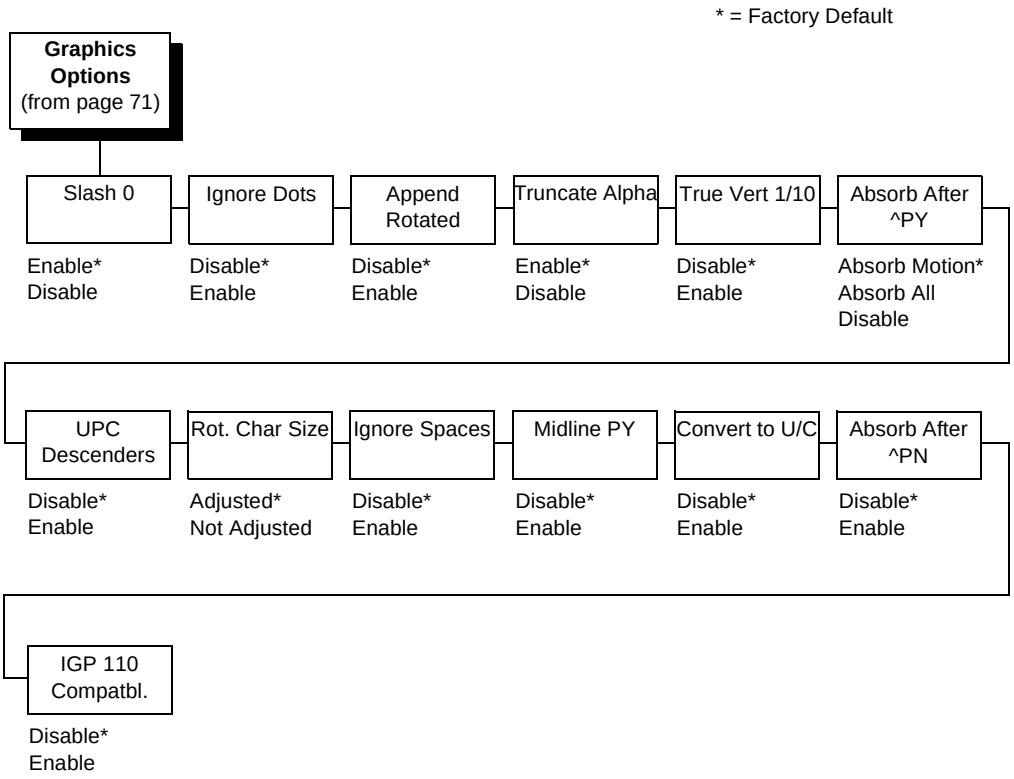
- **On**. Full error boundary checking reported. Any element which falls off the current page is reported as an error.
- **Debug Mode**. The printer is put in debug mode whenever a form is defined in Create Form Mode. Each line of the Create Form is printed along with an error if one occurred. This is the same functionality as if there were a slash (/) entered before the Create Form Name.
- **Fault**. When an error occurs, the error is printed, and the message “IGP/PGL ERROR” appears on the printer front panel. The printer then stops printing and goes offline. The error must be cleared before the printer can resume normal operation.
- **Off**. No form boundary checking. Graphic elements appear clipped if they are beyond the page boundaries.

IGP/VGL Emulation

The IGP/VGL (Code V) emulation can be configured either through the printer's front panel or from the host computer with control codes. For a detailed description of configuration with control codes, see the *QMS Code V Technical Reference Manual.* For information on configuring the emulation through the printer's front panel, see the submenu below and the parameter descriptions that follow.

* = Factory Default





SFCC & Pwrup

This option has several suboptions which define the SFCC and power-up configuration used with Code V.

SFCC

This option selects the Special Function Control Code. The default value is the caret ^ (decimal 94). Valid values are 17 through 255. Throughout this section, the ^ is used as the SFCC. Run a configuration printout to determine the currently selected SFCC.

Ignore Mode

- **Disable**. The default.
- **Enable**. Selects the ignore mode as the power-up default, and selects the graphics mode ^PY as the power-up default. All characters are ignored until a ^A command is received.

Free Format

- **Disable**. The default.
- **Enable**. Selects free format mode as the power-up default, and selects the graphics mode ^PY as the power-up default. Free format causes the Code V to ignore carriage returns, line feeds and all characters below hex 20 sent from the host.

Mgnum Conversion

- **Disable**. The default.
- **Enable**. Selects the graphics mode ^PY as the power-up default.

LPI

The number of lines to be printed per inch. For example, at 6 lpi there is 1/6 inch from the top of one print line to the top of the next print line.

Graphics Options

Following are several options which configure printing output.

Slash 0

This parameter allows you to print the numeral “0” with or without the slash. This option applies to all character sets except OCR-A and OCR-B.

- **Enable**. Zero is printed with a slash.
- **Disable**. Zero is printed without a slash.

Ignore Dots

- **Disable**. The default.
- **Enable**. Causes the Code V to expect position values to be specified in only 1/10ths of an inch. If the dot position is also given, it is treated as text.

Append Rotated

- **Disable**. Logos and alphanumeric strings are treated as separate elements.
- **Enable**. Appends logos to an alphanumeric string rotated in a clockwise, counterclockwise, or inverted orientation.

Truncate Alpha

When enabled, this parameter prevents the printing of Error 48 (Element Off Page Error) if alphanumeric data, including spaces, extends beyond the right side of the form.

True Vert 1/10

- **Disable**. A vertical 1/10 of an inch parameter is used as 7/72 of an inch. The absolute move is slightly smaller than expected. For example, a one inch move would be 70/72 of an inch. Vertical moves that have the same value will be identical in length.
- **Enable**. A vertical 1/10 of an inch parameter is used as 1/10 of an inch. Rounding occurs to the nearest 1/72 of an inch. This can cause vertical moves that have the same value to differ by ± 1/72 of an inch.

Absorb after ^PY

- **Absorb Motion**. Prevents paper motion following a system terminator in a graphics ^PY command.
- **Absorb All**. The system ignores all the data and terminator until a host generated terminator is detected.
- **Disable.** System terminators following a graphics command are sent to the printer and result in paper motion.

UPC Descenders

- **Disable**. UPC/EAN bar codes are printed without descenders if there is no human readable data.
- **Enable**. UPC/EAN bar codes are printed with descenders, even if there is no human readable data.

Rot. Char Size

- **Adjusted**. Rotated (clockwise/counterclockwise), expanded characters have a different size than an unrotated character with the same size parameters.
- **Not Adjusted**. Rotated, expanded characters will be the same size as unrotated characters with the same size parameters.

Ignore Spaces

- **Disable**. Trailing spaces are not deleted from alphanumeric elements in a graphics pass.
- **Enable**. Trailing spaces are deleted from alphanumeric elements in a graphics pass.

Midline PY (includes ^PN)

- **Disable**. The Graphics mode Enable command, ^PY, must be the first three characters of a line.
- **Enable**. The ^PY or ^PN can occur anywhere in a line.

Convert to U/C

- **Disable**. Lowercase characters are printed normally.
- **Enable**. All lowercase alphabetic characters are converted to uppercase.

Absorb After ^PN

- **Disable**. All line terminators that immediately follow the ^PN command are sent to the printer and processed.
- **Enable**. All line terminators that immediately follow the ^PN command are ignored.

IGP 110 Compatbl.

This option instructs the Code V to behave similar to the IGP-110 with respect to certain commands. All new users with new applications should select the “Disable” option. Selecting this mode insures the printer will behave as described in this manual.

- **Disable**. The IGP does not emulate the IGP-110 mode.
- **Enable**. The IGP emulates the IGP-110 version.

Error Handling

Following are several options which define how errors are reported.

Error msgs

- **Enable**. Command syntax is checked and error messages printed when command parameters are incorrect.
- **Disable**. Error checking and error messages are suppressed.

Error markers

- **Enable**. Prints the following error markers for those elements that print beyond the page boundaries:

  >> for elements that begin off the right side of the page;

  << for elements that begin at the indicated position but end off the page;

  ♦ for elements where the starting position of the command contains an error other than an off-page error.

Offpage Errors

- **Disable**. Does not report errors for elements that start or end beyond the right edge of the page.
- **Enable**. Reports errors for elements that start or end beyond the right edge of the page.

Barcode Errors

- **Enable**. An error message will print when invalid bar code data is encountered.
- **Disable**. Code V will not print an error for illegal bar code data; the bar code will be skipped.

Note

When Barcode Errors is disabled, the Code V emulation will try to make the best use of invalid data by either truncating extra digits or adding zeros to the end of bar code data to meet minimum data length requirements for some bar codes. Not all errors will be corrected.

Ignore / DB8 Setup

Following are several options which define character filtering and data bit 8.

Ignore Nulls

- **Disable**. None of the null characters (hex 00 or 80) are ignored.
- **Enable**. Null characters are filtered out of the data stream.

Data Bit 8

- **Enable**. The PI line is not passed directly from host to printer; all 8 bits are used for data bits, and characters in the hex 80-FF range can be accessed.
- **Disable**. When the host PI line is enabled, data bit 8 internally indicates PI line status. To use the PI line, disable data bit 8, and enable the Host PI configuration option (under the PI Control option, below).

Note

Data bit 8 is interpreted as either data bit 8 or the PI signal, but never both. When enabled as data bit 8, data bit 8 has priority over the PI signal, and all data above hex 7F is used to access character data and not to interpret PI line data.
Conversely, when data bit 8 is disabled and the PI signal is used, data bit 8 of the data is reserved for use as the PI function, and you cannot access characters in the hex 80-FF range. Therefore, to access characters in the hex 80-FF range, data bit 8 must be enabled.

ISO Char Set

This parameter allows you to select a font for the IGP/VGL feature. The default is 0, which is U.S. ASCII. The following values are valid choices:

0	U.S. ASCII
1	United Kingdom
2	Swedish/Finnish
3	Norwegian/Danish
4	Japanese
5	German
6	French
7	Italian
8	Spanish
9	PC Subset
10	Code V Version I

PI Control

Printer PI

- **Disable**. The ASCII emulation is configured with the PI line disabled.
- **Enable**. The ASCII emulation is configured with the PI line enabled.

Host PI

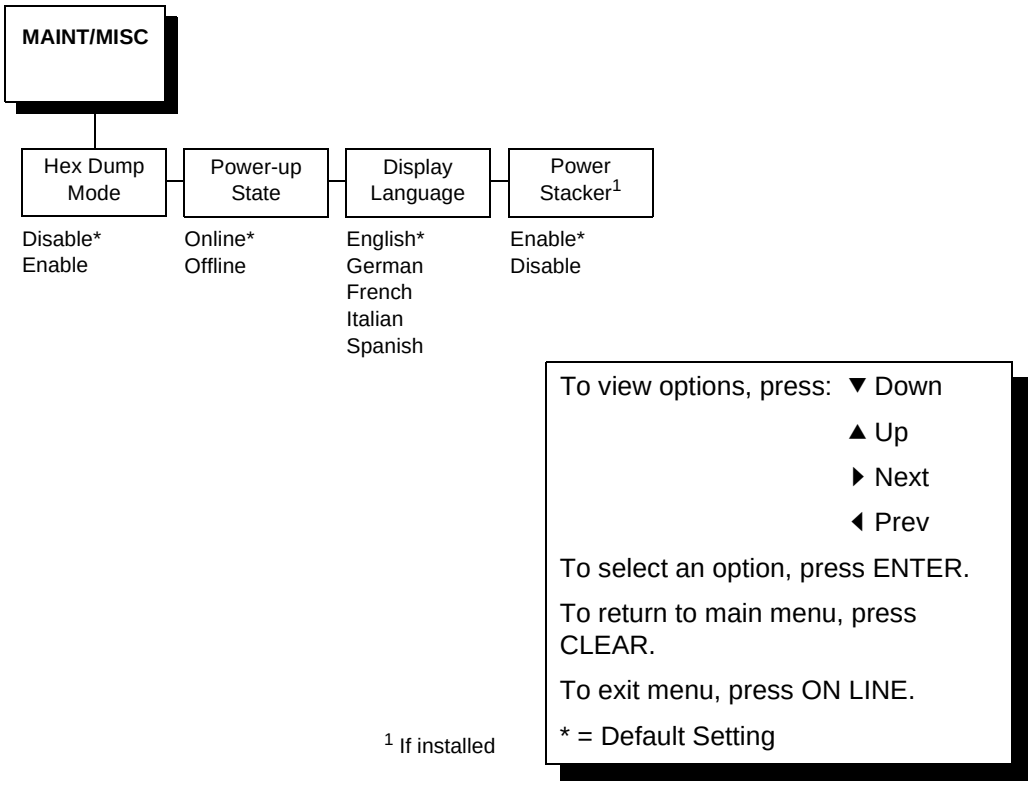
- **Disable**. The host does not send PI signals.
- **Enable**. The host sends PI signals. The Data Bit 8 configuration option must be disabled to transmit the PI line to the printer.

Max PI 16

- **Enable**. A paper slew of 0-15 will move 1-16 lines.
- **Disable**. A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will always move 1 line.

MAINT / MISC

Menu



Hex Dump Mode

A hex code printout (or hex dump) translates all incoming data to hexadecimal equivalents. A hex dump lists each ASCII data character received from the host computer, together with its corresponding two-digit hexadecimal code. Hex dumps can be used to troubleshoot some types of printer data reception problems. Figure 9 on page 113 shows a hex dump sample.

Power-Up State

This parameter allows you to configure the printer to power-up in the offline or online state. Online is the default.

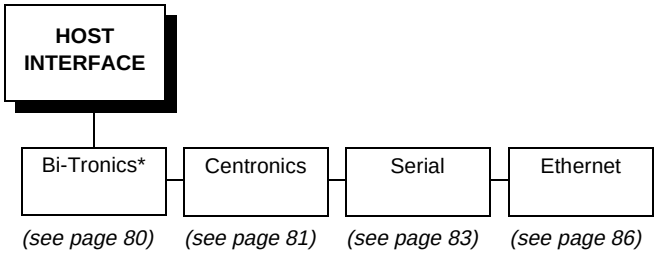
Display Language

This parameter chooses the language that will appear on the message display: English, Italian, French, German, or Spanish.

Power Stacker

This parameter, which is only presented with the LineJet 1500Q model, allows you to enable (the default) or disable power stacker operation.

HOST INTERFACE



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

The Host Interface Menu Diagram enables you to select and configure an interface between the printer and your host computer:

- Bi-Tronics (factory default)
- Serial
- Centronics
- Ethernet

Note

The printer will not work online unless the type of interface selected from the HOST INTERFACE menu matches the type of interface in your host computer. The interface in your host computer is the one that connects to the data cable of the printer. For example, if the interface in your computer is a serial interface, then the serial interface must be selected from the HOST INTERFACE menu in the printer.

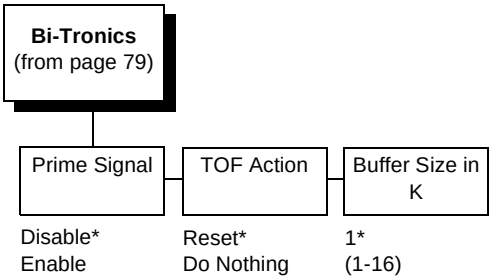
The currently selected interface is indicated with an asterisk on the control panel message display. Each interface has its own submenu, with the set of associated interface parameters that you may configure. The host interface and its associated parameters control the interface between the printer and your host computer. Descriptions follow for each of the host interface submenus.

Bi-Tronics Submenu

Note

The Bi-Tronics parameters in the printer must be set the same as the interface in the host computer (at the other end of the data cable of the printer). Otherwise, the printer might not work online, and data characters from the computer might not print or might print as “garbled” text.

* = Factory Default



Prime Signal

- **Disable.** The parallel port does not perform a warm start (reboot) if the host asserts the prime signal.
- **Enable.** The parallel port performs a warm start (reboot) if the host asserts the prime signal.

TOF Action

- **Reset.** A form feed is performed before a warm start when the prime signal is asserted from the host. This setting is used only if the Prime Signal parameter is enabled.
- **Do Nothing.** No form feed is performed on reset.

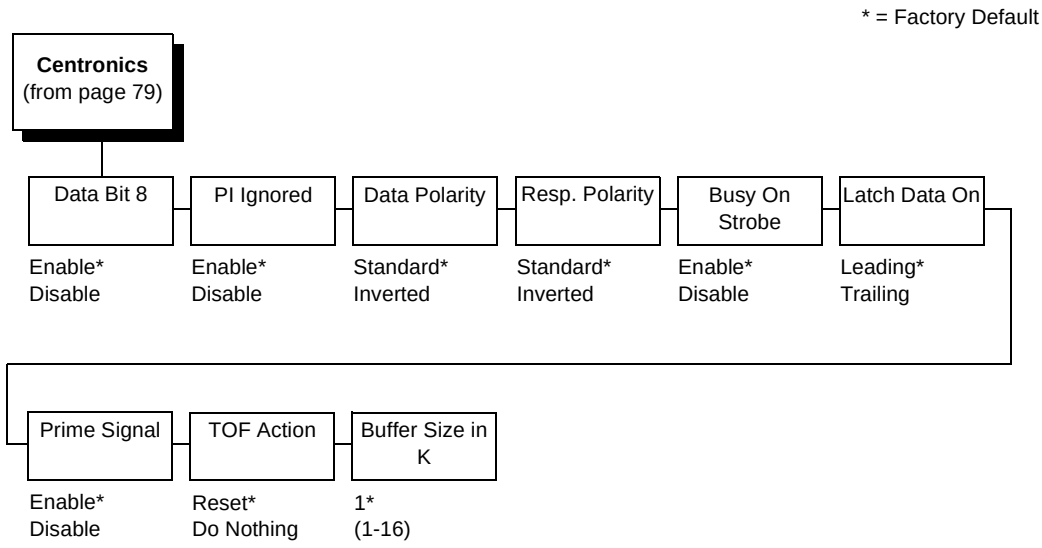
Buffer Size in K

This option configures the amount of memory allocated for the Bi-Tronics port buffer. You can designate the size of the printer buffer from 1 through 16 Kbytes.

Centronics (Parallel) Submenu

Note

The Centronics parameters in the printer must be set the same as the interface in the host computer (at the other end of the data cable of the printer). Otherwise, the printer might not work online, and data characters from the computer might not print or might print as “garbled” text.



The Centronics submenu provides the options and settings available to configure the interface as required for your application. These options and available settings are outlined in the following paragraphs.

Data Bit 8

- **Enable.** Allows access to the extended ASCII character set.
- **Disable.** The printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

PI Ignored

The PI (Paper Instruction) signal is used to control vertical paper motion.

- **Enable.** Ignores the PI signal and treats the data as characters or control codes.
- **Disable.** Causes the printer to interpret the eight data lines as VFU commands when the PI signal is true.

Data Polarity

The Data Polarity parameter must be set to match the data polarity of your host computer.

- **Standard.** Does not expect the host computer to invert the data.
- **Inverted.** Expects the data received on the data lines from the host computer to be inverted. Ones become zeros, and vice-versa.

Response Polarity

The Response Polarity parameter must be set to match the response polarity of your host computer. This option sets the polarity of the Acknowledge, Online, Fault, Paper Empty, and Busy signals.

- **Standard.** Does not invert the response signals.
- **Inverted.** Inverts the response signals sent to the host computer.

Busy on Strobe

- **Enable.** Asserts a busy signal after each character is received.
- **Disable.** Asserts a busy signal only when the print buffers are full.

Latch Data On

The Latch Data On parameter specifies whether the data is read on the leading or trailing edge of the data strobe signal.

Prime Signal

- **Disable.** The parallel port does not perform a warm start (reboot) if the host asserts the prime signal.
- **Enable.** The parallel port performs a warm start (reboot) if the host asserts the prime signal.

TOF Action

- **Reset.** A form feed is performed before a warm start when the prime signal is asserted from the host. This setting is used only if the Prime Signal parameter is enabled.
- **Do Nothing.** No form feed is performed on reset.

Buffer Size in K

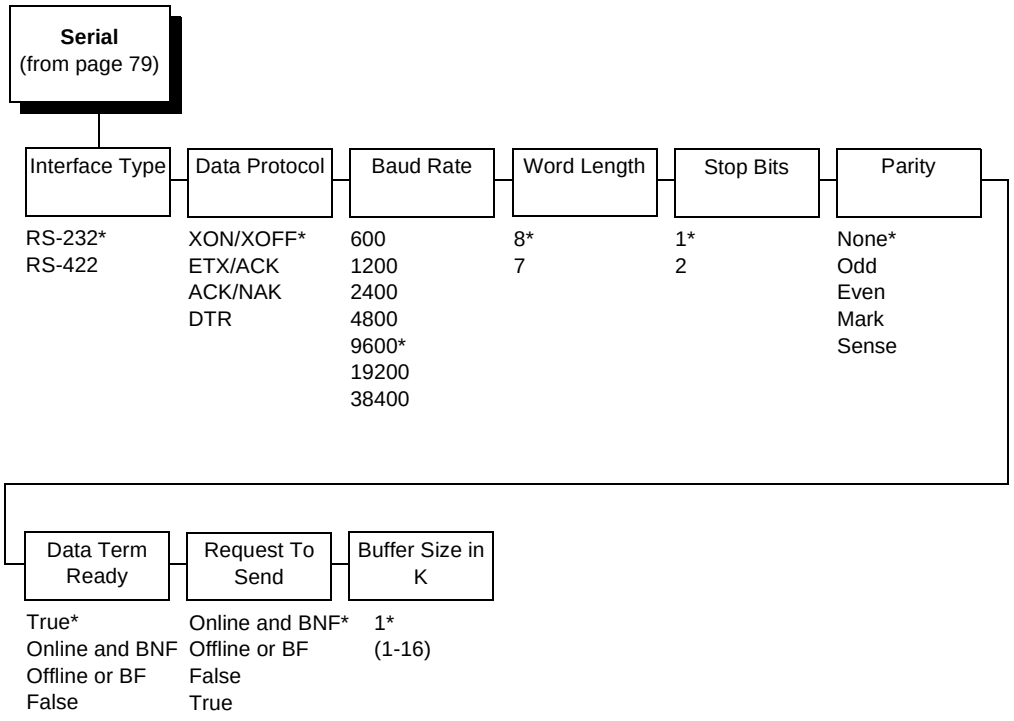
Configures the amount of memory allocated for the Centronics parallel port buffer. The default is 1 Kbytes, but you can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

Serial Submenu

Note

The serial parameters in the printer must be set the same as the interface in the host computer (at the other end of the data cable of the printer). Otherwise, the printer might not work online, and data characters from the computer might not print or might print as “garbled” text.

* = Factory Default



The serial submenu allows you to choose the configuration of the Serial host interface type, as shown above. Several other serial parameters are included on this menu, as shown below and described in the following pages.

Interface Type

Allows you to select either the RS-232 (the default) or RS-422 serial port interface.

Data Protocol

You can select one of the following serial interface protocols to meet the host interface requirements.

- **XON / XOFF.** The default. The printer controls the flow of communication from the host by turning the transmission on and off.

  In some situations, such as when the buffer is full or the timing of signals is too slow or too fast, the printer will tell the host to stop transmission by sending an XOFF character.

  An XOFF character is sent when the number of empty bytes in the buffer is less than or equal to 25 percent of the buffer size.

  If the host keeps sending data after an XOFF is sent, the printer firmware will continue to send an XOFF for every 16 characters received.

  When cleared, the printer will resume receiving data (XON). The data does not have any End of Text codes; XON / XOFF is a non-block protocol.
- **ETX / ACK.** End of Text / Acknowledge. The host controls the flow of communication to the printer by sending a block of data and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it will acknowledge the ETX, thereby acknowledging it has received the entire block of data.
- **ACK / NAK.** ACK means acknowledge; the device acknowledges it has accepted a transmission. NAK means a negative acknowledge; the device did not receive the transmission.
- **DTR.** Data Terminal Ready. The printer controls the data flow by sending this hardware signal to the host. If there is enough room in the printer buffer, the printer will send a high signal; if the buffer is full the printer will send a low signal. DTR tells the host if it is safe to send more data. If the host sends data during an unsafe condition, data will be lost.

Baud Rate

Sets the baud rate of the serial interface in the printer. Baud rate is the speed at which serial data is transferred between the host computer and the printer. The choices for the RS-232 and RS-422 interfaces are 600, 1200, 2400, 4800, 9600, 19200, and 38400. The default is 9600 baud.

Note

If you select a baud rate that is 19200 or greater, you may need to increase the Buffer Size in K parameter from the default (1 Kbyte), to improve performance.

Word Length

Sets the length of the serial data word. The length of the data word can be set to 7 or 8 bits, and must match the corresponding data bits setting in the host computer. The default is 8 bits.

Stop Bits

Sets the number of stop bits in the serial data word. Either one or two stop bits can be selected. The setting must match the corresponding stop bit setting in the host computer. The default is 1 bit.

Parity

Set for odd parity, even parity, mark, sense, or no parity. The setting must match the corresponding parity setting in the host computer. The default is None.

Data Terminal Ready

This configuration is part of hardware flow control and determines when the Data Terminal Ready (DTR) signal is generated. This signal indicates whether or not the printer is ready to receive data.

- **True.** Continuously asserts the DTR signal (the default).
- **On-Line and BNF (buffer not full).** Asserts the DTR signal when the printer is online and the internal serial buffer is not full.
- **Off-Line or BF (buffer full).** Asserts the DTR signal when the printer is offline or the internal serial buffer is full.
- **False.** Never asserts the DTR signal.

Request to Send

This configuration is part of hardware flow control and determines when the Request to Send (RTS) signal is generated. This signal indicates whether or not the printer is ready to receive data.

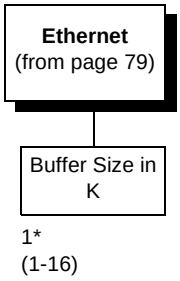
- **On-Line and BNF.** Asserts the RTS signal when the printer is online and the internal serial buffer is not full (the default).
- **Off-Line or BF.** Asserts the RTS signal when the printer is offline or the internal serial buffer is full.
- **False.** Never asserts the RTS signal.
- **True.** Continuously asserts the RTS signal.

Buffer Size in K

Configures the amount of memory allocated for the serial port buffer. The default is 1 Kbytes, but you may specify between 1 and 16 Kbytes, in 1-Kbyte increments.

Ethernet Submenu

* = Factory Default



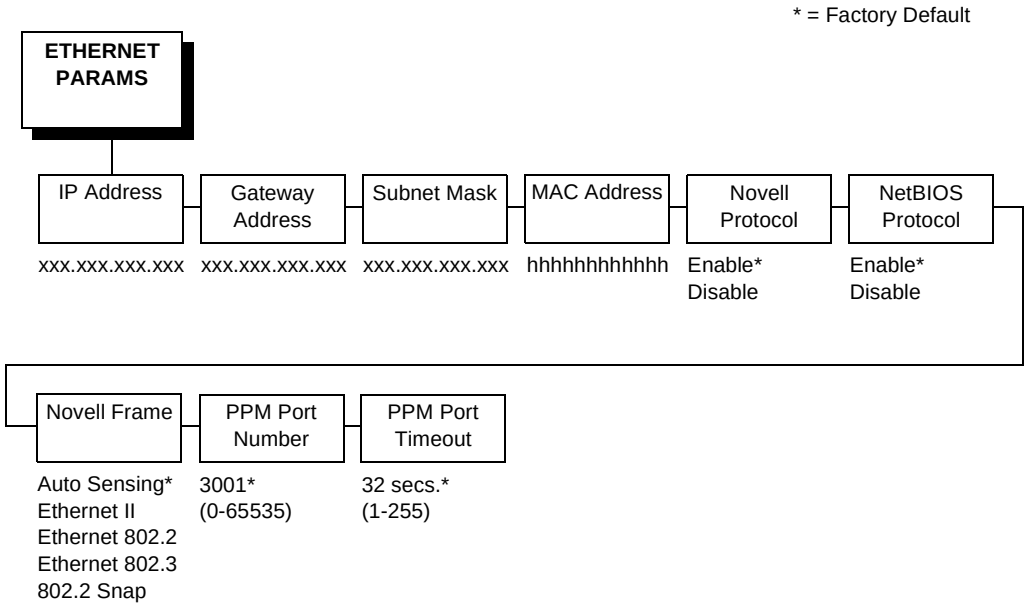
The Ethernet interface allows you to locate the printer on a LAN rather than attach the host directly into the printer. The detailed configuration of this option is given in the *LineJet Print Server User's Guide*.

Buffer Size in K

This option configures the amount of memory allocated for the Ethernet buffer. You can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

ETHERNET PARAMETERS

Menu



The ETHERNET PARAMS menu helps your printer communicate on a network.

For information on assigning the IP Address, Gateway Address, Subnet Mask and MAC Address, refer to the *LineJet Print Server User's Guide*.

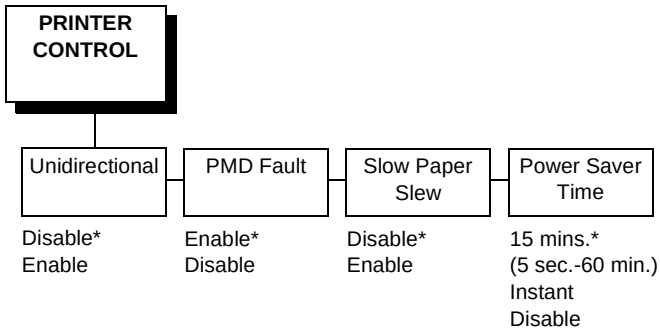
You may also enable or disable the Novell or NetBIOS Protocols within this menu, as well as selecting which Novell Frame scheme is used in processing Novell signals. See the Novell chapter in the *LineJet Print Server User's Guide* for more details.

If the printer is connected to the LineJet Printer Manager utility, the PPM Port number and PPM Port Timeout settings must match the settings in the LineJet Printer Manager program. See the LineJet Printer Manager manual for details.

PRINTER CONTROL

The printer control menu allows you to choose the printer's behavior. Options on this menu, as shown below, are described in the following pages.

Menu



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

Unidirectional

The Unidirectional feature affects both print quality and printing speed. By setting this feature, you can configure the printer to print in both directions of the shuttle sweep (bidirectional), or to print in one direction only (unidirectional).

You might want to enable this feature when printing bar codes, high quality text and graphics, or other printing that requires precise vertical alignment.

Although enabling this feature reduces print speed, it enhances the vertical alignment of dots and produces cleaner, sharper bar codes and text. Choices include the following:

- **Disable.** The printer will print all data in both directions of the shuttle sweep (bidirectional printing). This choice produces higher printing speed. The default.
- **Enable.** The printer will print all data in only one direction of the shuttle sweep (unidirectional printing). This choice produces higher print quality.

PMD (Paper Motion Detection) Fault

- **Enable.** If a paper jam occurs, an audible alarm beeps, “CLEAR PAPER JAM” appears on the message display, and the printer stops printing.
- **Disable.** You should disable PMD only if special paper requires it.

Caution

Once PMD is disabled, paper motion is not monitored. If a paper jam occurs, the printer ignores the condition and continues to print, possibly causing severe damage to the printer.

Slow Paper Slew

This parameter affects the speed at which paper advances into the stacking area of the printer. The speed may be slowed down by enabling this feature.

- **Disable.** The default. The printer will slew and stack paper at maximum speed.
- **Enable.** Causes the paper to stack at a slower pace. This ensures that certain forms will stack more neatly.

Power Saver Time

Power Saver is also referred to as the ENERGY STAR® Office Equipment Program. The Power Saver feature places the printer in “sleep mode” when the printer has not been used for a specified number of minutes. In sleep mode the printer is in low-energy idle state, all fans and higher voltages are off, and only +5Vdc logical circuits are active.

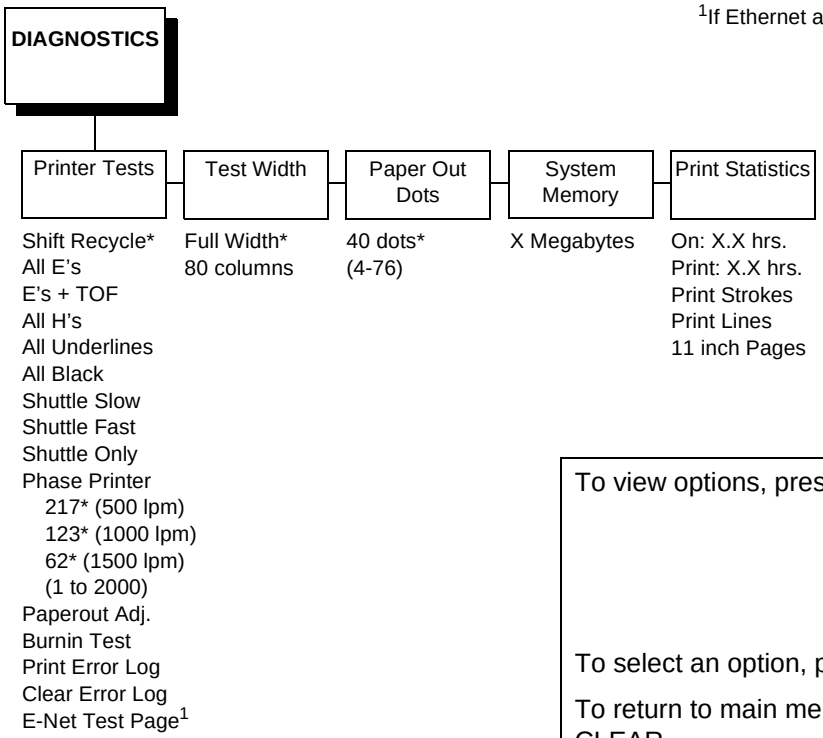
You can designate the number of minutes after which the printer will go into sleep mode. The range of time is 0 to 60 minutes. Fifteen minutes is the default.

Pressing any key on the control panel or sending a print job to the printer will turn off sleep mode.

DIAGNOSTICS

The diagnostics menu allows you to choose the diagnostics tests to be run and provides you with important system information. Options on this menu, as shown below, are described in the following pages.

[1]If Ethernet adapter is present



To view options, press: ▼ Down
▲ Up
▶ Next
◀ Prev

To select an option, press ENTER.

To return to main menu, press CLEAR.

To exit menu, press ON LINE.

* = Default Setting

Printer Tests

The printer tests are used to check the print quality and printer operation.

Note

Your Customer Service Engineer typically runs these tests. They are described in more detail in the *LineJet Printers: Maintenance Manual*.

A procedure for running the tests appears on page 111. They are briefly described below:

- **Shift Recycle.** A sliding alphanumeric pattern that identifies missing or malformed characters, improper vertical alignment, or vertical compression.

- **All E's.** A pattern of all uppercase E's that identifies missing characters, misplaced dots, smeared characters, improper phasing problems, or light/dark character variations.
- **E's plus TOF.** A pattern of all E's followed by a form feed to the next page top of form, that identifies paper motion or feeding problems.
- **All H's.** A pattern of all uppercase H's used to detect missing characters, misplaced dots, smeared characters, or improper phasing.
- **All Underlines.** An underline pattern useful for identifying hammer bank misalignment.
- **All Black.** A condition where all dot positions are printed, creating a solid black band.
- **Shuttle Slow.** Verifies proper operation by exercising shuttle and ribbon motion at low speed.
- **Shuttle Fast.** Verifies proper operation by exercising shuttle and ribbon motion at fast speed.
- **Shuttle Only.** Exercises only the shuttle at fast speed.
- **Phase Printer.** Checks for wavy print. The initial phase value is set in the factory. Run the test and check the quality. (The phase value prints on the left margin.) If the print looks too wavy, change the Phase Value parameter while the test is running. While the phase printer test runs, press the ▼ key. A value between 1 and 2000 displays. To change the value, press the ◀ or ▶ key until the desired value displays and then press ENTER. Only Customer Service Engineers should run this test.

Note

The printer must be printing the phase pattern of "H's" when the Phasing Value is changed or the new phasing value will not be written into non-volatile RAM (NVRAM). If the value is changed when not printing, the printer will return to its default phasing value when powered off and then back on.

- **Paperout Adjust.** This allows you to set where the last line of text will print when there is a paper out condition. Setting this parameter correctly prevents printing on the platen from occurring. The *LineJet Printers: Maintenance Manual* describes in detail how to run this test. Only a Hewlett-Packard Customer Service Engineer should run this test.
- **Burnin Test.** Running this test is not recommended.
- **Print Error Log.** Prints a log of the last 50 errors that have occurred in the printer.
- **Clear Error Log.** Clears the error log.
- **E-Net Test Page.** Prints the Ethernet statistics stored on the Ethernet adapter (if present).

Test Width

This parameter permits you to run the self-tests at full width or 80 columns.

Caution

This parameter must match paper width used. If full width is selected for use with 80-column or 8.5-inch wide paper, damage to the hammer tips and platen may result.

Paper Out Dots

This parameter is used to adjust the paper out distance from the perforation; you can specify where the last line on the page will print when there is a paper out condition. Setting this parameter correctly prevents printing on the platen.

Only Customer Service Engineers should set this parameter.

System Memory

This parameter displays the amount of RAM installed.

Print Statistics

You can view various printer statistics, such as hours of usage, and refer to these figures for preventive maintenance purposes. Printer statistics accumulate continuously; they do not reset when you turn off the printer.

All of the printer statistics are set to zero at the factory after burn-in testing.

- **On.** The cumulative time in hours the printer has been powered on. The range is 0 to 30,000 hours.
- **Print.** The cumulative time in hours the printer has actually been printing. The range is 0 to 30,000 hours.
- **Print Strokes.** The cumulative number of back-and-forth shuttle strokes the printer has printed during normal printer operation. The range is 0 to 2,147,483,648 shuttle strokes.
- **Print Lines.** The cumulative number of lines the printer has printed. The range is 0 to 2,147,483,648 print lines.
- **11 inch Pages.** The cumulative number of pages the printer has printed. The range in print pages is 0 to 2,147,483,648 total inches of paper movement divided by 11.

RIBBONMINDER

RibbonMinder is a user-definable software feature which notifies the user when a ribbon should be changed. It does this by monitoring ink consumption and alerts you when the print quality falls below a level you designate. This is especially important if you are printing bar codes to be scanned.

```
ON LINE      100%
<printer emulation>
```

As printing continues, the percentage of usable ink in the ribbon decreases.

```
ON LINE       74%
<printer emulation>
```

Ribbon ink being consumed

```
ON LINE        8%
<printer emulation>
```

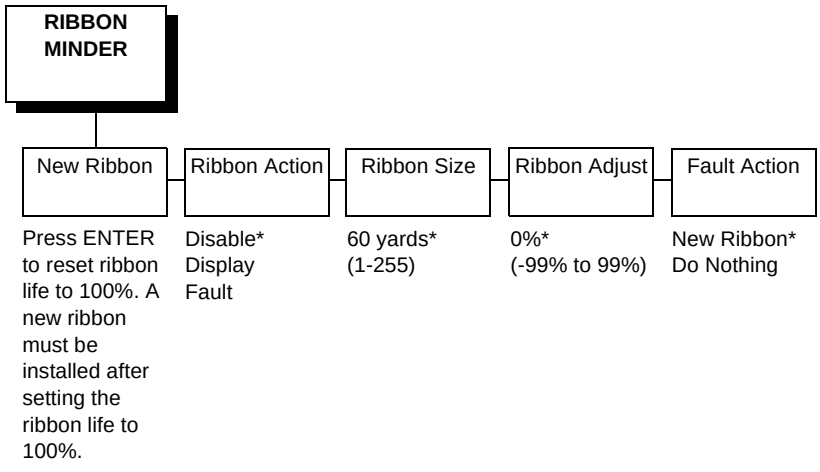
Ribbon life approaching end

When 0% usable ink appears, the printer is typically configured to stop printing and display the following message:

```
RIBBON INK OUT
CHANGE RIBBON
```

NOTE: Once you have set up options for RibbonMinder, it works without attention. When you begin printing with RibbonMinder enabled, the message display shows a ribbon life value of 100%. The ribbon life decreases as the ink is consumed.

* = Factory Default



New Ribbon

Whenever you install a new ribbon, you must reset the ribbon life to 100%.

Once you install the new ribbon, work your way through the configuration menus until “New Ribbon” appears on the LCD. Press the ENTER key to reset the ribbon life to 100%.

Ribbon Action

- **Disable**. Removes the ink consumption display. RibbonMinder will continue to monitor how much ink is left in the ribbon.
- **Display**. Activates the RibbonMinder ink consumption display. Allows you to continually monitor the percentage of ink left in the ribbon.
- **Fault**. Activates a fault message when the display reaches 0%.

Ribbon Size

The standard ribbon size is 60 yards for the pedestal model and 100 yards for the cabinet model. These are the factory default settings. You can use the Ribbon Size option to specify the ribbon length in one-yard increments, with a maximum of 255 yards.

Ribbon Adjust

Adjust the number of pages printed before the display reaches 0%. If the ribbon normally prints 1000 pages before reaching 0%, configuring the Ribbon Adjust to 20% will print 200 more pages than normal before reaching 0%. A Ribbon Adjust setting of -20% will cause the display to reach 0% after 200 fewer pages than normal. The setting can range from -99% through 99%.

Fault Action

- **New Ribbon**. Changing the ribbon while in the RIBBON INK OUT / CHANGE RIBBON fault mode will reset the ribbon life to 100%, just as if the New Ribbon menu option was executed.
- **Do Nothing**. The ribbon life may only be reset through the New Ribbon menu option.

RibbonMinder Fault

When the RIBBON INK OUT / CHANGE RIBBON fault message appears on the LCD, press the CLEAR key to remove the fault message, then replace the ribbon (see your *Quick Reference Guide*). If you need to complete a current print job before replacing the ribbon, press ON LINE. This allows the printer to continue printing for an additional two minutes. After the two-minute period has elapsed, the fault will reoccur if the Ribbon Action parameter remains set on Fault. If Ribbon Action is changed to Disable or Display within the two-minute period, the fault will not recur; disable RibbonMinder if you do not want to change the ribbon at this time. The fault message will reappear once the function is enabled again, and the printer status indicator will flash until the ribbon is changed.

4 *Interfaces*

Overview

The printer interface is the point where the data line from the host computer plugs into the printer. The interface processes all communications signals and data to and from the host computer. It consists of a printed circuit board assembly (PCBA) and a connector for the data cable from the host computer. Communication signals and data may be sent over parallel or serial lines.

When data is sent through multiple interface, the Autoport Switching feature forces the printer to automatically switch between the serial and parallel port and between the Ethernet adapter and the serial port when the LineJet Print Server is installed.

This chapter describes the following interfaces provided with the printer.

- Centronics
- Bi-Tronics
- RS-232 serial
- RS-422 serial

Centronics Parallel Interface

The Centronics interface enables the printer to operate with controllers designed for buffered Centronics printers. The length of the data cable from the host computer to the printer must not exceed 15 feet (5 meters).

Table 8. Centronics Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
DATA LINE 1	2	ACKNOWLEDGE	10	CHASSIS GROUND	17
Return	20	Return	28		
DATA LINE 2	3	ONLINE	13	GROUND	30
Return	21	Return	28		
DATA LINE 3	4	FAULT	32	Spares	14
Return	22	Return	29		
DATA LINE 4	5	PAPER EMPTY	12	No Connection	34,35,
Return	23	Return	28		36
DATA LINE 5	6	BUSY	11	+5 Volts	18
Return	24	Return	29		
DATA LINE 6	7				
Return	25				
DATA LINE 7	8				
Return	26				
DATA LINE 8	9				
Return	27				
DATA STROBE	1				
Return	19				
PAPER INSTRUCTION	15				
Return	29				
PRIME	31				
Return	30				

Centronics Interface Signals

The Centronics interface signals between the host computer and the printer are defined as follows:

Data Lines 1 through 8. Provide eight standard or inverted levels from the host that specify a character or function code. Data Line 8 allows access to the extended ASCII character set. You may enable or disable this line via the Data Bit 8 parameter on the Centronics submenu.

Data Strobe. Carries a low true, 100 ns min. pulse from the host that clocks data into the printer.

Paper Instruction (PI). Carries a VFU control signal from the host with the same timing as the data lines.

Acknowledge. A low true pulse from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

Online. A high true level from the printer to indicate the printer is ready for data transfer and the ON LINE key on the operator panel has been activated. When the printer is in Online mode, it may accept data from the host.

Paper Empty (PE). A high true level from the printer to indicate the printer is in a fault condition.

Busy. A high true level from the printer to indicate the printer cannot receive data.

Centronics Parallel Interface Configuration

Your printer is configured at the factory to match the interface you specified. By using the operator panel, you may verify and change several interface parameters in order to meet specific application requirements.

Refer to “Centronics (Parallel) Submenu” on page 81 for Centronics parameter descriptions and information on selecting values for the following parameters:

- Data Bit 8 (enable or disable)
- Data Polarity (standard or inverted)
- Strobe Polarity (standard or inverted)
- Response Polarity (standard or inverted)
- Busy on Strobe (enable or disable)
- Latch Data On Leading or Trailing Edge of Strobe
- Prime Signal (enable or disable)
- TOF Action at Prime Signal (do nothing or form feed)
- I/O Buffer Size (1-6)

Some application programs require a unique configuration. If the printer is not working properly in the configuration you have selected, contact a Hewlett-Packard service representative.

Bi-Tronics Parallel Interface

Bi-Tronics is a parallel interface with bidirectional capabilities. Features include the following:

- Timing of the signals has been reduced, therefore speeding data transmission.
- Bidirectional communication. Both the host and the printer can send data.
- Versatility. If a device can not send data along particular lines, the Bi-Tronics interface can send data via other operating modes, such as Nibble Mode which is discussed later.
- Less user interaction. The host can ask the printer about printing status and supported features, such as fonts and internal errors. For example, instead of having to physically check if the printer has run out of paper, you can create a program to query this from the host. The printer will respond and a message will display on the host.

Operating Modes

The Bi-Tronics interface supports three operating modes, which are determined by negotiation between the printer and the host.

Compatibility Mode

This mode provides compatibility with Centronics-like host I/O. Data is transferred from the host to the printer in 8-bit bytes over the data lines.

Compatibility Mode can be combined with Nibble and Byte Modes to provide bidirectional communication.

Nibble Mode

Eight bits equals one byte. When a byte of data is sent to the printer, the eight bits are sent over eight data lines.

Some devices cannot send data over their eight data lines. To bypass this, the Bi-Tronics interface permits data to be sent as half a byte over four status lines. (Half a byte equals one nibble.) Two sequential four-bit nibbles are sent over the lines.

Data is transferred from printer to host in four-bit nibbles over the status lines, and the host controls the transmission.

Byte Mode

The printer and host send data to each other along eight data lines (one bit per line).

If bidirectional communication is supported by the printer and the host, the host will take control of the data transfer.

The Negotiation Phase

The negotiation phase determines which operating mode will be used. At this time, the host and the printer will sense what devices are attached, the supported signals available, and which mode to use. The selected mode, in turn, defines the pins on the Bi-Tronics interface connector.

There are 36 pins on the parallel interface. Each one sends a different signal. Pin 1, for example, can send a Strobe signal or a HostClk signal, depending on the mode selected. Table 9 shows the different definitions.

Signals

Bi-Tronics interface signals between the host and the printer are defined below.

Host Clock / nWrite. Driven by host. Data transferred from host to printer. When printer sends data, two types are available. If Nibble Mode, signal is set high. If Byte Mode, signal is set low.

Data 1 through Data 8. These pins are host-driven in Compatibility Mode and bidirectional in Byte Mode. They are not used in Nibble Mode. Data 1 is the least significant bit; Data 8 is the most significant bit.

Printer Clock / Peripheral Clock / Interrupt. Driven by the printer. A signal from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

Printer Busy / Peripheral Acknowledge / nWait. Driven by the printer. Indicates the printer cannot receive data. (Data bits 4 and 8 in Nibble Mode.)

Acknowledge Data Request / nAcknowledge Reverse. Driven by the printer. Indicates the printer is in a fault condition. (Data bits 3 and 7 in Nibble Mode.)

Xflag. Driven by the printer. A high true level indicating the printer is ready for data transfer and the printer is on-line. (Data bits 2 and 6 in Nibble Mode.)

Host Busy / Host Acknowledge / NDStrobe. Driven by the host. Activates auto-line feed mode.

Peripheral Logic High. Driven by the printer. When set high, the printer indicates all of its signals are in a valid state. When set low, the printer indicates its power is off or its signals are in an invalid state.

nReverse Request. Driven by the host. Resets the interface and forces a return to Compatibility Mode idle phase.

nData Available / nPeripheral Request. Driven by the printer. Indicates the printer has encountered an error. (Data bits 1 and 5 in Nibble Mode.)

1284 Active / nAStrobe. Driven by the host. A peripheral device is selected.

Host Logic High. Driven by the host. When set to high, the host indicates all of its signals are in a valid state. When set to low, the host indicates its power is off or its signals are in an invalid state.

nInit. Resets init interface from the host.

NOTE: The length of the data cable from the host computer to the printer should not exceed 10 meters (32 feet).

Table 9. Bi-Tronics Signals

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
1	Host	nStrobe	HostClk	Host/Clk
2	Host/Printer	Data 1 (LSB)		
3	Host/Printer	Data 2		
4	Host/Printer	Data 3		
5	Host/Printer	Data 4		
6	Host/Printer	Data 5		
7	Host/Printer	Data 6		
8	Host/Printer	Data 7		
9	Host/Printer	Data 8 (MSB)		
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy	PtrBusy
12	Printer	PError	AckDataReq	AckDataReq
13	Printer	Select	Xflag	Xflag
14	Host	nAutoFd	Host Busy	HostAck
15		Not Defined		
16		Logic Grid		
17		Chassis Grid		
18	Printer	Peripheral Logic High		
19		Signal Ground (nStrobe)		
20		Signal Ground (Data 1)		
21		Signal Ground (Data 2)		
22		Signal Ground (Data 3)		
23		Signal Ground (Data 4)		
24		Signal Ground (Data 5)		
25		Signal Ground (Data 6)		
26		Signal Ground (Data 7)		
27		Signal Ground (Data 8)		

Table 9. Bi-Tronics Signals (continued)

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
28		Signal Ground (PError, Select, nAck)		
29		Signal Ground (Busy, nFault)		
30		Signal Ground (nAutoFd, nSelectIn, nInit)		
31	Host	nInit		
32	Printer	NFault	nDataAvail	aDataAvail
33		Not Defined		
34		Not Defined		
35		Not Defined		
36	Host	nSelectIn	1284 Active	1284 Active

RS-232 and RS-422 Serial Interfaces

Note

The RS-232 and RS-422 serial interface circuit characteristics are compatible with the Electronic Industry Association Specifications EIA®-232-E and EIA-422-B.

The RS-232 and RS-422 serial interfaces enable the printer to operate with bit serial devices that are compatible with an RS-232 controller. The input serial data transfer rate (in baud) is selectable from the printer operator panel. Baud rates of 600, 1200, 2400, 4800, 9600, 19,200, and 38,400 are available for RS-232 and RS-422.

The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The number of data bits is determined by printer configuration. The data bits are interpreted with the least significant bit first. Parity checking is determined by printer configuration options selected from the operator panel.

The printer interface uses a first-in/first-out buffer. The asynchronous interface accepts data as it is provided by the host. The length of the data cable from the host computer to the printer must not exceed 50 feet (15 meters) for RS-232 or 4000 feet (1220 meters) for RS-422. (A copper conductor, twisted-pair telephone cable with a shunt capacitance of 16 pF/foot [52.5 pF/meter] terminated in a 100 ohm resistive load must be used for the RS-422.)

Table 10. RS-232 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
Receive Data (RD)	3	Transmit Data (TD)	2	Chassis Ground	1
Clear To Send (CTS)	5	Request To Send (RTS)	4	Signal Ground	7
Data Set Ready (DSR)	6	Data Terminal Ready (DTR)	20		
Data Carrier Detect (DCD)	8				

Table 11. RS-422 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
- Receive Data (-RD)	15	- Transmit Data (-TD)	19	Chassis Ground	1
+ Receive Data (+RD)	17	+ Transmit Data (+TD)	25	Signal Ground	7

RS-232 and RS-422 Serial Interface Signals

The RS-232/RS-422 connector mounted on the printer is a 25-pin DB-25S type. The mating connector is a DB-25P. RS-232 and RS-422 compatible serial interface signals are defined as follows:

RS-232

Transmitted Data (TD). Serial data stream from the printer for transmitting status and control information to the host. Subject to protocol selection.

Received Data (RD). Serial data stream to the printer.

Request To Send (RTS). Control signal from the printer. Subject to configuration.

Clear To Send (CTS). Status signal to the printer indicating the host is ready to receive data/status signals from the printer.

Data Set Ready (DSR). Status signal to the printer indicating the host is in a ready condition.

Data Carrier Detect (DCD). Status signal to the printer. The ON condition is required for the printer to receive data.

Data Terminal Ready (DTR). Control signal from the printer. Subject to configuration.

RS-422

+RD, -RD. Serial data stream differentially received by printer.

+TD, -TD. Differentially driven serial data stream for transmitting status and control information to the host. Subject to protocol selection.

Note

±RD and ±TD form signal and return paths of a differential line signal.

RS-232 and RS-422 Serial Interface Protocol

X-ON/X-OFF. The printer transmits an X-ON character (hex 11) when entering the Online mode or when the buffer is almost empty. The printer transmits an X-OFF character (hex 13) when entering the Offline mode or when the buffer is almost full.

RS-232 and RS-422 Serial Interface Error Handling

Note

All serial errors are treated as faults that require operator intervention.

Parity Error Handling. Parity error checking is a configuration option selected from the operator panel.

With odd or even parity checking selected, a character with a parity error is replaced with a question mark (?) character.

When parity checking is not selected (“NONE” on the operator panel), parity errors are ignored and the characters are printed as received.

Framing Error Handling. Framing error checking is always in effect for the serial interface.

When a framing error occurs, an exclamation point (!) is printed. If 20 successive errors are received, a line feed is added to force printing to occur.

Overrun Error Handling. Overrun error checking is always in effect for the serial interface.

When a data overrun error occurs, an asterisk (*) is printed. If 20 successive errors are received, a line feed is added to force printing to occur.

RS-232 and RS-422 Serial Interface Configuration

By using the control panel, you can verify and change several interface parameters in order to meet specific application requirements.

Refer to “Serial Submenu” on page 83 for RS-232 and RS-422 parameter descriptions and information on selecting values for the following parameters:

RS-232 and RS-422

- Baud Rate (data rate selected from the operator panel)
- Data Bits (7 or 8 Bits)
- Stop Bits (1 or 2 Bits)
- Parity (None, Odd, Even, Mark or Sense)

RS-232 only

- Data Terminal Ready logic
- Request to Send logic

Some application programs require a unique configuration. If the printer is not working properly with the configuration you selected, contact a Hewlett-Packard service representative.

5 *Routine Service and Diagnostics*

Routine Service

Periodic cleaning ensures efficient operation and clear print quality.

If the printer is located in a dusty area or is used for heavy duty printing, clean it more often.

Periodic cleaning is the only maintenance your printer requires. If print quality does not improve even after cleaning, contact your Hewlett-Packard Customer Service Engineer.

Warning

Disconnect the power source before cleaning the printer.

Warnung

Vor dem Säubern des Druckers ist die Netzverbindung zu unterbrechen.

Attention

Débranchez l’alimentation avant de nettoyer l’imprimante.

Exterior Cleaning

Clean with a soft, lint-free cloth and mild detergent soap. (Dishwashing liquid works well.) Do not use abrasive powders or chemical solvents. Clean the windows with plain water or mild window cleaner. Always apply the cleaning solution to the cloth; never pour cleaning solution directly onto the printer.

Interior Cleaning

Over time, particles of paper and ink accumulate inside impact printers. This is normal. Paper dust and ink build-up must be periodically removed to avoid degraded print quality. Most paper dust accumulates around the ends of the platen and ribbon path.

To clean the interior of the printer, perform the following steps and refer to Figure 7 for cabinet models and Figure 8 for pedestal models.

1. Power off the printer power and unplug the printer power cord.
2. Open the printer cover. Fully raise the forms thickness lever. Unload paper. Refer to the *LineJet Printers: Quick Reference Guide*.
3. Unlatch both ribbon spools and carefully lift them off the hubs. Raise the ribbon out of the ribbon path.
4. Using a soft-bristled, non-metallic brush (such as a toothbrush), brush paper dust and ribbon lint off the tractors, shuttle cover assembly, base casting, and ribbon guides. Vacuum up the residue.

Caution

Vacuum carefully around the hammer bank and surrounding area to avoid damage.

5. Wipe the splined shaft with a soft cloth.
6. Check the ribbon mask and hammer bank cover for bits of torn paper or ribbon lint. Check the holes in the ribbon mask surrounding each hammer tip. Gently remove paper or lint particles with a wooden stick or pair of tweezers. (Do not pry or apply force to the hammer tips.)
7. Using a soft cloth lightly moistened with anhydrous alcohol (no water), remove dust and ink from the platen. (The platen is the thick silver bar behind the hammer bank cover that rotates when the forms thickness lever is rotated.) Clean the ribbon guides.
8. Brush and vacuum up dust or residue that has accumulated inside the lower cabinet.
9. For cabinet models:
   Wipe the lower cabinet interior with a clean, lint-free cloth dampened (not wet) with water and mild detergent, or spray the surfaces lightly with window cleaning solution. Dry the lower cabinet interior by wiping it with a clean, lint-free cloth.
10. For models with a power paper stacker:
    Wipe all power stacker components using a soft cloth lightly moistened with anhydrous alcohol (no water) to remove dust.
11. Reinstall the ribbon and load paper. Refer to the *LineJet Printers: Quick Reference Guide*.

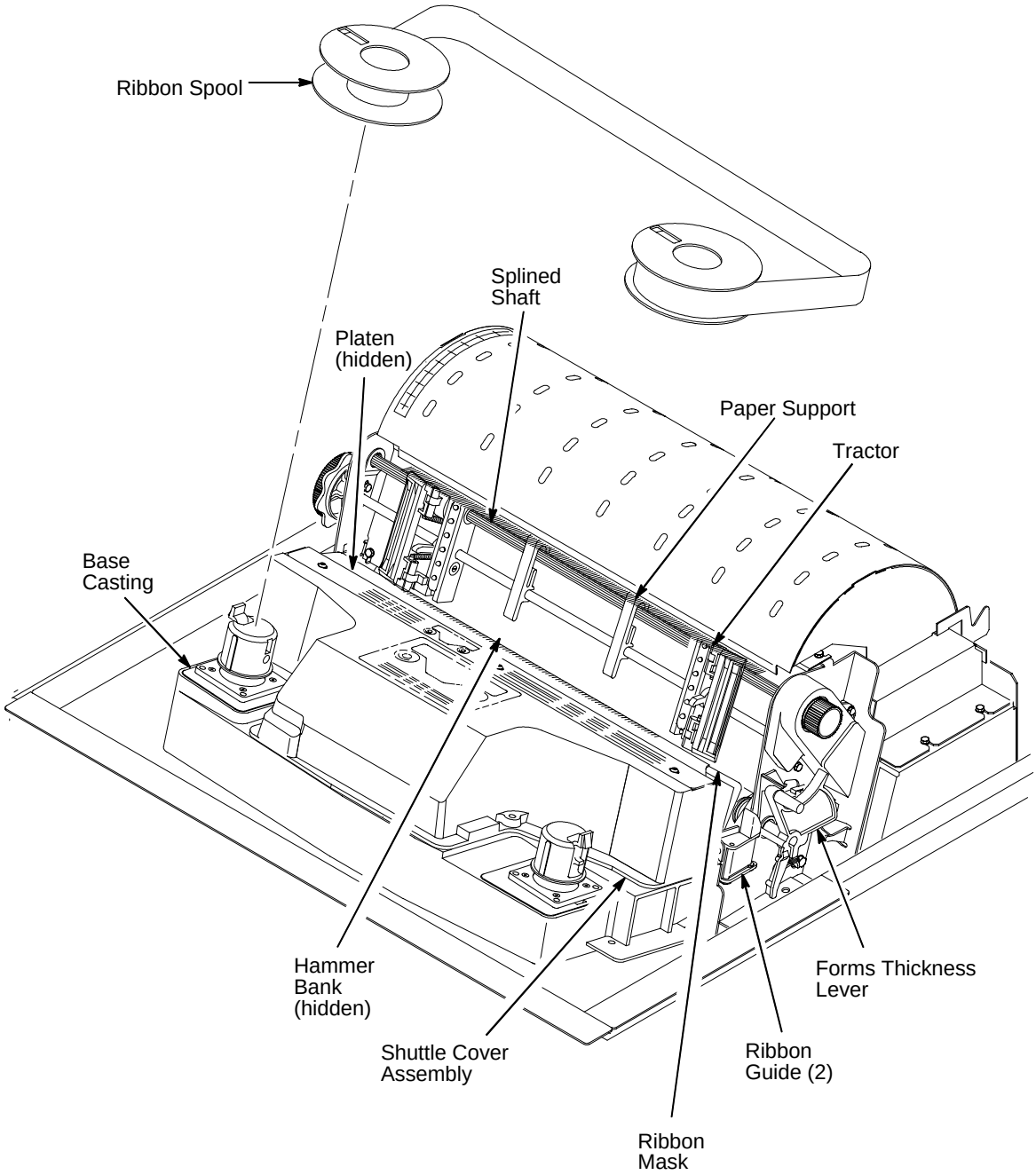


Figure 7. Cleaning the Print Mechanism (Cabinet Models)

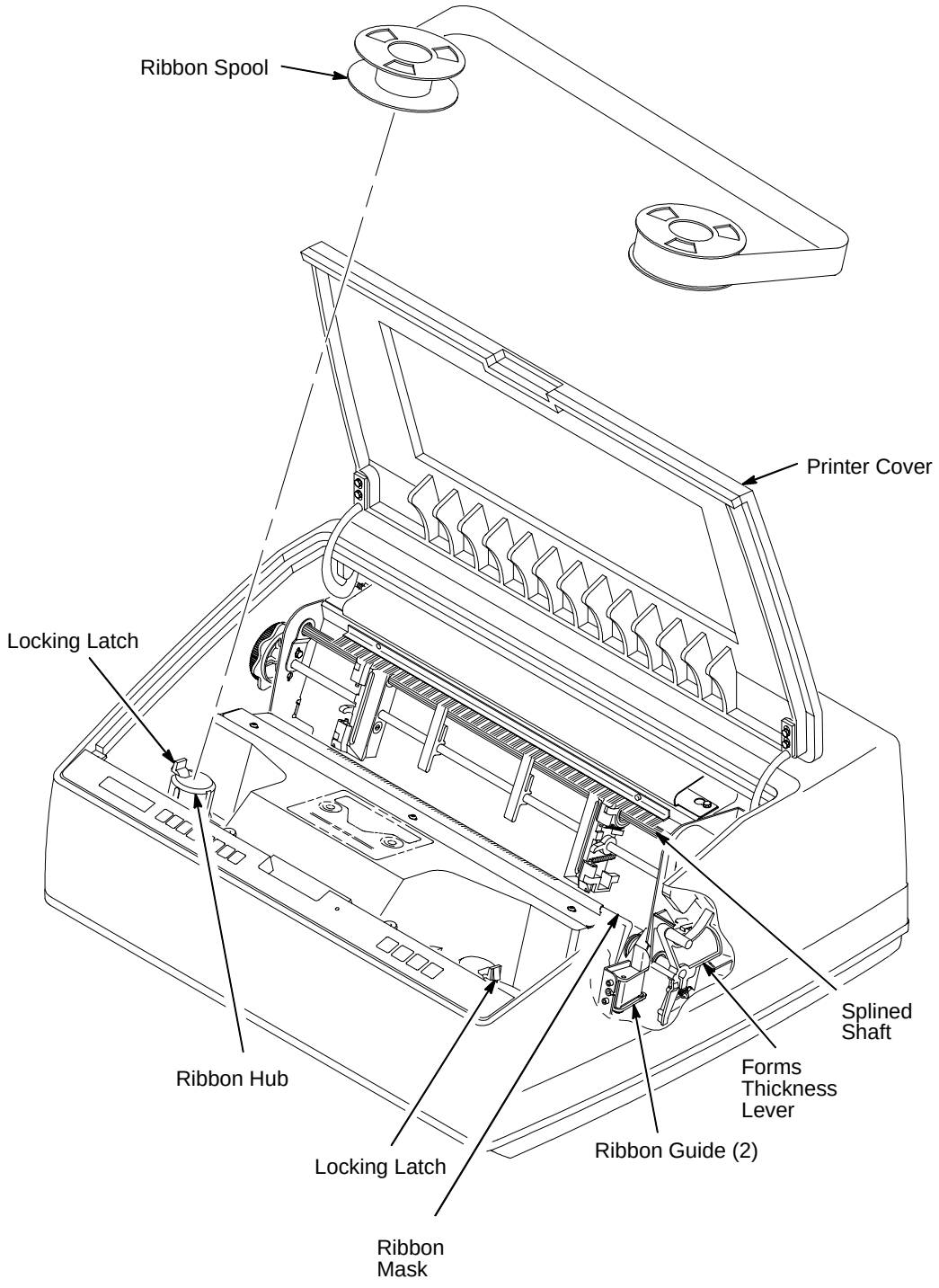


Figure 8. Cleaning the Print Mechanism (Pedestal Models)

Diagnosing Problems

This section is designed to help you recover from any problems which may arise with normal printer operation.

Printer Self-Tests

The printer self-tests are used to check the print quality and operation of your printer. Your Hewlett-Packard Customer Service Engineer will typically run these tests. For a description of each test, see page 90.

To activate a test, select it and press the ENTER key. To stop the test, press ENTER again.

Note

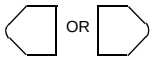
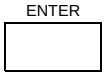
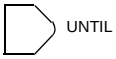
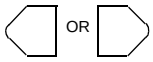
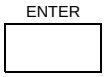
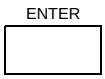
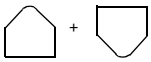
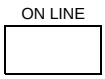
Whenever you run a self-test, the top-of-form setting is lost. You must reset the top-of-form. See your *LineJet Printers: Quick Reference Guide*.

An example procedure for running the self-test “All E’s”, which determines whether print quality is acceptable, is described in Table 12.

Table 12. Sample Print Test (All E’s)

Step	Key	Result	Notes
1.	Install the ribbon. Load full-width (136-column) computer paper. Set top-of-form. See your *Quick Reference Guide*.		
2.	ON LINE	OFFLINE CONFIG. CONTROL	The printer must be offline for testing.
3.	+	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
		OFFLINE CONFIG. CONTROL	
4.	UNTIL	OFFLINE DIAGNOSTICS	
5.		DIAGNOSTICS Printer Tests	
6.	UNTIL	DIAGNOSTICS Test Width	
7.		Test Width Full Width*	

Table 12. Sample Print Test (All E's) (continued)

Step	Key	Result	Notes
8.		Test Width X	Cycle through the choices. X = **Full Width** or **80 columns**.
9.		Test Width X*	The width you have chosen will be used for the printer test.
10.		DIAGNOSTICS Test Width	
11.		DIAGNOSTICS Printer Tests	
12.		Printer Tests Shift Recycle*	
13.		Printer Tests All E's	
14.		Printer Tests All E's*	Starts the test.
15.		Printer Tests All E's*	Stops the test.
16.		ENTER SWITCH LOCKED	Locks the ENTER key.
17.		ONLINE	
18.	Examine the print quality. The characters should be fully formed and of uniform density. If the test does not run or characters appear malformed, contact your Hewlett-Packard Customer Service Engineer.		
19.	If the print quality is good, set the top-of-form.		

Printing a Hex Dump

```
 !"#$%&'()*+,-./ 20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
0123456789:;<=>? 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
@ABCDEFGHIJKLMNO 40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F
PQRSTUVWXYZ[\]^_ 50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F
`abcdefghijklmno 60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F
pqrstuvwxyz{|}~  70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E 20
!"#$%&'()*+,-./0 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F 30
123456789:;<=>?@ 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F 40
ABCDEFGH..!"#$%& 41 42 43 44 45 46 47 48 0D 0A 21 22 23 24 25 26
'()*+,-./0123456 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35 36
789:;<=>?@ABCDEF 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45 46
GHIJKLMNOPQRSTUV 47 48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54 55 56
WXYZ[\]^_`abcdef 57 58 59 5A 5B 5C 5D 5E 5F 60 61 62 63 64 65 66
ghijklmnopqrstuv 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74 75 76
wxyz{|}~ !"#$%&' 77 78 79 7A 7B 7C 7D 7E 20 21 22 23 24 25 26 27
()*+,-./01234567 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35 36 37
89:;<=>?@ABCDEFG 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45 46 47
HI..'#$%&'()*+,- 48 49 0D 0A 22 23 24 25 26 27 28 29 2A 2B 2C 2D
./0123456789:;<= 2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D
>?@ABCDEFGHIJKLM 3E 3F 40 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D
NOPQRSTUVWXYZ[\] 4E 4F 50 51 52 53 54 55 56 57 58 59 5A 5B 5C 5D
^_`abcdefghijklm 5E 5F 60 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D
nopqrstuvwxyz{|} 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D
~ !"#$%&'()*+,-. 7E 20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E
/0123456789:;<=> 2F 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E
?@ABCDEFGHIJ..#$ 3F 40 41 42 43 44 45 46 47 48 49 4A 0D 0A 23 24
%&'()*+,-./01234 25 26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34
56789:;<=>?@ABCD 35 36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44
EFGHIJKLMNOPQRST 45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 51 52 53 54
UVWXYZ[\]^_`abcd 55 56 57 58 59 5A 5B 5C 5D 5E 5F 60 61 62 63 64
efghijklmnopqrst 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74
uvwxyz{|}~ !"#$% 75 76 77 78 79 7A 7B 7C 7D 7E 20 21 22 23 24 25
&'()*+,-./012345 26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32 33 34 35
6789:;<=>?@ABCDE 36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42 43 44 45
FGHIJK..$%&'()*+ 46 47 48 49 4A 4B 0D 0A 24 25 26 27 28 29 2A 2B
,-./0123456789:; 2C 2D 2E 2F 30 31 32 33 34 35 36 37 38 39 3A 3B
<=>?@ABCDEFGHIJK 3C 3D 3E 3F 40 41 42 43 44 45 46 47 48 49 4A 4B
LMNOPQRSTUVWXYZ[ 4C 4D 4E 4F 50 51 52 53 54 55 56 57 58 59 5A 5B
\]^_`abcdefghijk 5C 5D 5E 5F 60 61 62 63 64 65 66 67 68 69 6A 6B
lmnopqrstuvwxyz{ 6C 6D 6E 6F 70 71 72 73 74 75 76 77 78 79 7A 7B
|}~ !"#$%&'()*+, 7C 7D 7E 20 21 22 23 24 25 26 27 28 29 2A 2B 2C
```

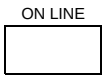
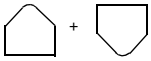
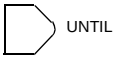
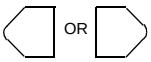
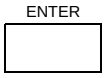
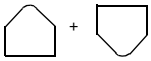
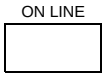
Figure 9. Hex Dump Sample

A hex code printout (or hex dump) is a translation of all host interface data to its hexadecimal or symbolic equivalent. A hex dump lists all ASCII character data received from the host computer with their corresponding two-digit hexadecimal codes. Hex dumps are used to troubleshoot printer data reception problems.

Printable characters print as the assigned symbol; nonprintable characters are indicated by a period (.).

See Appendix B for hex-to-ASCII conversion. Table 13 shows the procedure for printing a hex dump.

Table 13. Printing a Hex Dump

Step	Key	Result	Notes
1.	Make sure the printer is on. Raise the printer cover.		
2.		OFFLINE CONFIG. CONTROL	The printer must be offline for testing.
3.		ENTER SWITCH UNLOCKED OFFLINE CONFIG. CONTROL	Allows you to make configuration changes.
4.		OFFLINE MAINT / MISC	
5.		MAINT / MISC Hex Dump Mode	
7.		Hex Dump Mode Disable*	
8.		Hex Dump Mode Enable	Cycle through the choices.
9.		Hex Dump Mode Enable*	An asterisk (*) indicates this choice is active.
16.		ENTER SWITCH LOCKED	Locks the ENTER key.
17.		ONLINE	
18.	Go to the host computer and send a file. The printer outputs a hex dump. Refer to the ASCII chart in Appendix B.		
19.	When the hex dump is complete, change the Hex Dump Mode back to Disable by following the steps outlined above and selecting Disable.		

Fault Messages

If a fault condition occurs in the printer, the status indicator on the control panel flashes on and off and the message display indicates the specific fault. Fault messages are summarized in Table 14.

Displayed faults fall into one of two categories:

- Operator correctable
- Field service required

For the operator-correctable faults, follow the suggested corrective action in the fault message description. After correcting the displayed fault, press the CLEAR key to clear the error message and status indicator, and resume printing. If the fault message reappears, contact your Hewlett-Packard Customer Service Engineer.

Fault Messages Requiring Field Service Attention

For faults that require field service, do two things to try to clear the fault before you call your Hewlett-Packard Customer Service Engineer:

1. Set the printer power switch to O (off), wait 15 seconds, then turn the printer on again. Run your print job again. If the message does not appear, it was a false indication and no further attention is required.
2. If the message reappears, press the CLEAR key. If the message goes away, it was a false indication and no further attention is required. If the message reappears, call your Hewlett-Packard Customer Service Engineer.

Table 14 explains the fault messages and offers solutions where possible.

Table 14. LCD Message Troubleshooting Table

Displayed Message	Can User Correct?	Explanation	Solution
8.5V PWR FAIL*	No	Internal power failure.	Contact your Hewlett-Packard Customer Service Engineer.[1]
15V PWR FAIL*	No	Controller voltage failure.	Contact your Hewlett-Packard Customer Service Engineer.[1]
23.5V PWR FAIL*	No	Controller voltage failure.	Contact your Hewlett-Packard Customer Service Engineer.[1]
48V PWR FAIL*	No	Internal power failure.	Contact your Hewlett-Packard Customer Service Engineer.[1]
ACCESS NULL PTR*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
A TO D OVERUN*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
BUFFER OVERRUN	Yes	Host sends data after the printer buffer is full. (Serial interface.)	Check your serial host interface parameter settings; if necessary, adjust them so that they match the settings of the attached host.
CLEAR PAPER JAM	Yes	No paper motion.	Clear jam and reload paper. (See *Quick Reference Guide*.) If this message recurs, contact your Hewlett-Packard Customer Service Engineer.[1]
CLOSE PLATEN	Yes	The forms thickness lever is open.	Close the forms thickness lever.
COIL HOT*	No	One or more hammer coils are overheating.	Contact your Hewlett-Packard Customer Service Engineer.[1]
CTL VOLT FAIL*	No	Controller voltage failure.	Contact your Hewlett-Packard Customer Service Engineer.[1]
DRVR CIR BAD*	No	Hammer coil count test failed.	Contact your Hewlett-Packard Customer Service Engineer.[1]
ETHERNET ADAPTER BEING INITIALIZED	N/A	LineJet Print Server interface is processing the boot procedure.	No action required.
ETHERNET DETECTED	N/A	LineJet Print Server interface has established communication.	No action required.

Table 14. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
EXHAUST FAN FLT	Yes	Sensors cannot detect current in fan circuit.	Power off the printer and remove the paper path. Check that the fan cable connector is connected. Check for obstruction of vents and fan airway, and remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message recurs, contact your Hewlett-Packard Customer Service Engineer.[1]
FIRMWARE ERROR*	No	Application software tried to perform an illegal printer function or damaged memory detected on board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
FRAMING ERROR	Yes	Serial framing error. (Serial interface.)	Check your serial host interface parameter settings; if necessary, adjust them so that they match the settings of the attached host.
HAM. COIL OPEN*	No	Electrical malfunction of one or more hammer coils.	Contact your Hewlett-Packard Customer Service Engineer.[1]
HAMMER COIL BAD X, X, X,...	Yes	Coil # failed current test at power-up.	Record message, clear to continue printing, and contact your Hewlett-Packard Customer Service Engineer.
HB NOT INSTALLD*	No	Self-test does not detect hammer coils.	Contact your Hewlett-Packard Customer Service Engineer.[1]
HMR BANK FAN FLT	Yes	Sensors cannot detect current in fan circuit.	Power off printer and remove paper path. Check that fan cable is connected. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message recurs, contact your Hewlett-Packard Customer Service Engineer.[1]

Table 14. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
ILL EXT BUS ACC*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
ILLGL OPR ACCSS*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
ILL INST ACCSS*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
INTAKE FAN FAULT	Yes	Sensors cannot detect current in fan circuit.	See description for HMR BANK FAN FLT.
LO DRV. SHORT *	No	Circuit(s) on the hammer bank or in the hammer bank power cable shorted to ground.	Contact your Hewlett-Packard Customer Service Engineer.[1]
LOAD PAPER	Yes	Printer is out of paper.	Load paper.
PAP BAD TABLE*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP BSY TOO LNG*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP FIFO OVERFL*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP FIFO UNDRFL*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP ILLGL ST*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP INCMPL ENER*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP INVLD CMD*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP INVLD PARM*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP NOT SCHED*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP NT AT SPEED*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PAP UNEXP INT*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]

Table 14. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
PARITY ERROR	Yes	Parity error (serial interface)	Check your serial host interface parameter settings; if necessary, adjust them so that they match the settings of the attached host.
PLAT INV CMD*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PLAT INV PARM*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PLAT INV STATE*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
POWER SAVER MODE	N/A	Status message: printer is in low-energy idle state, all fans and higher voltages are off, only +5Vdc logic circuits are active.	No action required.
POWER SUPPLY HOT*	No	Circuits are overheating on the power supply board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PRINTER HOT*	No	Controller board sensors report high temperatures on the board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PROTECTED INSTR*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
PWR SUPP VOLT *	No	Power supply failed.	Replace power supply board.
RIB INVLD CMD*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
RIB INVLD STATE*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
RIBBON DRIVE*	No	CMX controller does not detect ribbon drive motor.	Contact your Hewlett-Packard Customer Service Engineer.[1]
RIBBON INK OUT CHANGE RIBBON	Yes	RibbonMinder software has determined that the ribbon is out of ink.	Install a new ribbon and set ribbon life to 100%.

Table 14. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
SECURITY CODE VIOLATION*	No	Security code of PAL on controller board does not match code of firmware on the controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
SECURITY PAL NOT DETECTED	No	The security PAL is missing or has failed.	Contact your Hewlett-Packard Customer Service Engineer.[1]
SHUTL INV CMD*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
SHUTL INV PARM*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
SHUTTLE JAM	Yes	No shuttle movement or shuttle moving at wrong speed.	Check for obstruction to shuttle, a twisted ribbon, or forms thickness lever closed too tightly. If fault source is not apparent, contact your Hewlett-Packard Customer Service Engineer.
SOFTWARE ERROR * Cycle power	No	Application software tried to perform illegal printer function, or damaged logic circuits found on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
STACK OVERFLOW*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
STACK UNDERFLOW*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
STACKER FULL	Yes	Reached full capacity.	Remove paper stack.
STACKER FAULT	No	Failed motor circuit.	Contact your Hewlett-Packard Customer Service Engineer.[1]
STACKER JAM	Yes	Jammed paper, or foreign object, in unit's travel path.	Remove paper or foreign object.
TCB CORRUPTED*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
UNDEF INTERRUPT*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]

Table 14. LCD Message Troubleshooting Table (continued)

Displayed Message	Can User Correct?	Explanation	Solution
UNDFNED OPCODE*	No	Fatal firmware error on controller board.	Contact your Hewlett-Packard Customer Service Engineer.[1]
UP DRV. SHORT *	No	Hammer driver circuits on the boards shorted to ground.	Contact your Hewlett-Packard Customer Service Engineer.[1]
WAITING FOR ETHERNET ADAPTER	N/A	This status message appears when the printer is first powered on if the optional LineJet Print Server interface is installed.	No action required.

[1] Before contacting a Hewlett-Packard Customer Service Engineer, power off the printer, wait 15 seconds, then power it back on and rerun your print job. If the message reappears, press CLEAR. If the fault message still displays, then contact your Hewlett-Packard Customer Service Engineer.

A Printer Specifications

Ribbon Specifications

Use only these Hewlett-Packard ribbon kits:

Ribbon Kit Number	Ribbon Type	Number of Ribbons in Kit
C3207A	60-yard text ribbon	6
C3208A	100-yard text ribbon	6
C3209A	60-yard bar code / OCR ribbon	6
C3210A	100-yard bar code / OCR ribbon	6

Printers are shipped with one box of 6, 60-yard bar code/OCR ribbons. 100-yard ribbons can only be used with cabinet models.

Additional supplies can be ordered in the USA by calling HP SafetyNet at 1-800-538-8787 (ask for “Ordering Supplies”). Outside the USA contact your local HP Sales Office.

Ribbon Life

60-yard text ribbon yields up to 20M characters
100-yard text ribbon yields up to 33M characters
Bar code/OCR ribbon yields are less than text ribbon yields.

Paper Specifications

Paper

Type:	Edge-perforated, fan-fold, 3 to 17 inches (7.62 to 43.18 cm) wide, 2 to 16 inches (5.08 to 40.64 cm) long. Power Paper Stacker option is 5 to 12 inches (12.7 to 30.48 cm) long.
Thickness:	Single-part: 15 to 100 pound (6.80 to 45.36 kg) stock; Multi-part: 1- to 6-part forms (maximum 12 lb [5.44 kg] ply of upper plies)
Sheet Thickness:	0.025 inch (0.064 cm) maximum
Drive:	Adjustable tractors (6-pin engagement)

Slew Rates:	**Fast:**	**Slow:**
500 lpm	12 ips	8 ips
1000 lpm	20 ips	12 ips
1500 lpm	20 ips	16 ips

Labels

On Backing:	One-part continuous perforated fanfold back form. Labels must be placed at least 1/6 inch (0.42 cm) from the fan-fold perforation. Backing adhesive must not be squeezed out during printing.
Sheet Size:	3 to 17 inches (7.62 to 43.18 cm) wide, including the two standard perforated tractor feed strips (3 to 16 inches for pedestal models and printers with the Power Paper Stacker installed). A maximum sheet length of 16 inches (40.64 cm) between top and bottom perforations. Power Paper Stacker option is 5 to 12 inches (12.7 to 30.48 cm) long.
Thickness:	Not to exceed 0.025 inch (0.064 cm) (including backing sheet)

Printer Dimensions

Cabinet Model:

Height:	42.5 inches (108 cm)
Width:	27 inches (68.6 cm)
Depth:	29 inches (73.7 cm)
Weight:	225 lbs. (102.1 kg) unpackaged 285 lbs. (129.3 kg) packaged

Cabinet Model with Power Stacker Option:

Height:	42.5 inches (108 cm)
Width	27 inches (68.6 cm)
Depth:	32.5 inches (82.5 cm)
Weight:	246 lbs. (112 kg) unpackaged 306 lbs. (139 kg) packaged

Pedestal Model:

Height:	35 inches (88.9 cm)
Width:	24.6 inches (62.5 cm)
Depth:	20.7 inches (52.6 cm)
Weight:	105 lbs. (47.6 kg) unpackaged 115 lbs. (52.2 kg) packaged

Environmental Characteristics

Temperature

Operating:

50° to 104° F (10° to 40° C) up to 5000 feet (1524 meters)

50° to 90° F (10° to 32° C) up to 8000 feet (2438 meters)

Storage:

- 40° to 158° F (- 40° to 70° C)

Relative Humidity

Operating: 15% to 80% (noncondensing)

Storage: 15% to 90% (noncondensing)

Acoustic Noise Level

	Cabinet Model	Pedestal Model
Acoustic Noise Levels per ISO 9296		
Printing	52 dB	65 dB
	6.8 Bel	8.0 Bel
Standby	48 dB	50 dB
	6.3 Bel	6.5 Bel
Geraeuschemission nach ISO 9296		
Druckend	52 dB	65 dB
	6.8 Bel	8.0 Bel
Betriebsbereit	48 dB	50 dB
	6.3 Bel	6.5 Bel

ENERGY STAR®

LineJet printers comply with the requirements of the ENERGY STAR® Office Equipment Program of the U.S. Environmental Protection Agency. When in the reduced power state, the printer displays “Power Saver Mode,” and is activated at the control panel.

Electrical Characteristics

Current				
	LineJet 500	**LineJet 500Q**	**LineJet 1000Q**	**LineJet 1500Q**
Printing, Typical[1]	2.15A	2.43A	3.28A	4.37A
Printing, Maximum[2]	3.60A	3.05A	4.39A	6.06A
Non-Printing[3]	0.90A	1.17A	1.19A	1.16A
Power				
Printing, Typical[1]	190W	191W	271W	364W
Printing,[2] Maximum	320W	244W	380W	514W
Non-Printing[3]	90W	84W	86W	84W
Heat				
Printing, Typical[1]	648 BTU/hr	652 BTU/hr	925 BTU/hr	1342 BTU/hr
Printing, Maximum[2]	1092 BTU/hr	833 BTU/hr	1297 BTU/hr	1754 BTU/hr
Non-Printing[3]	307 BTU/hr	287 BTU/hr	294 BTU/hr	287 BTU/hr

[1] Printing, Typical = 120 VAC, 50/60 Hz, Shift Recycle (ASCII Swirl), High Speed Mode

[2] Printing, Maximum = 120 VAC, 50/60 Hz, All Black, High Speed Mode

[3] Non-Printing = 120 VAC, 50/60 Hz, Standby Mode

ENERGY STAR®

All models below 1500 lpm are rated at 30W, 102 BTU/hr.

1500 lpm are rated at 45W, 154 BTU/hr.

Interfaces

Type:	Centronics Parallel; Bi-Tronics; Serial; Ethernet
Logic Levels:	TTL / EIA-232E / EIA-422B
Data Format	ASCII
Transfer Rates	Up to 200 Kilobytes on Centronics parallel interface. Up to 500 Kilobytes on Bi-Tronics interface. Up to 38.4K baud on RS-232 and RS-422 serial interfaces.

Communication Notices

Federal Communications Commission (FCC) Statement: This equipment has been tested and found to comply with 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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Hewlett-Packard Company is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Canadian Department of Communications Compliance Statement:

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Avis de conformité aux normes du ministère des Communications du Canada:

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union (EC) Electromagnetic Compatibility Directives: This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Hewlett-Packard Company cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-Hewlett-Packard Company option cards.

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu furhren.

Properly shielded and grounded cables and connectors must be used in order to reduce the potential for causing interference to radio and TV communication and to other electrical or electronic equipment.

This product has been tested and found to comply with limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese Klasse von Geräten gilt folgende Bestimmung nach dem EMVG:

Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesminesters für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind.

(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis: Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlict worden.

Japanese EMI:

注意

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づく第一種情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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取り扱い説明書に従って正しい取り扱いをして下さい。

Printing Rates

The printing speed of text is measured in lines per minute (lpm), and is a function of the selected font and the vertical dot density. Printing speed is independent of the number of characters configured in the character set repertoire. Print rates for lines containing attributes such as bold or emphasized printing, superscripts, subscripts, or elongated attributes will decrease to not less than half the rates of the font without such attributes.

The plotting speed of graphics is measured in inches per minute (ipm).

To prevent damage from overheating when graphics plotting is done over extended periods, the hammer bank contains a thermal sensing feature that automatically reduces the print rate.

Typical printing rates are charted in Table 15.

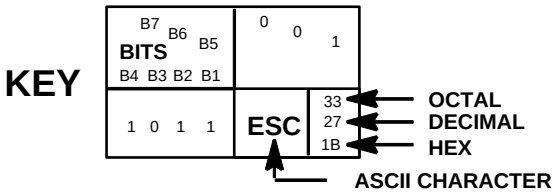
Table 15. Nominal Printing Rates

PRINT QUALITY DOT DENSITY NOTE [1]	CHARAC-TERS PER INCH	DOT MATRIX NOTE [2]	PERFORMANCE								
			UPPERCASE ONLY LPM			DESCENDERS & UNDERLINE LPM			PLOT MODE IPM		
		MODEL	500	1000	1500	500	1000	1500	500	1000	1500
CORRESPONDENCE 90 (180) X 96	10	7 (13) X 9 +3	200	400	600	154	306	459	21	42	61
	12	6 (11) X 9 + 3									
	15	5 (9) X 9 + 3									
DATA PROCESSING 60 (120) X 72	10	5 (9) X 7 + 2	375	750	1125	300	600	900	42	83	127
	12	4 (7) X 7 + 2									
	13.3	4 (7) X 7 + 2									
	15	3 (5) X 7 + 2									
	17.1	3 (5) X 7 + 2									
HIGH SPEED 60 (120) X 48	10	5 (9) X 5 + 1	500	1000	1500	428	856	1284	63	125	187
	12	4 (7) X 5 + 1									
	13.3	4 (7) X 5 + 1									

NOTE: [1] A (B) X C, where: A is maximum horizontal dot density
B is horizontal dot placement density
C is vertical dot density

NOTE: [2] D (E) X F + G, where: D is maximum number of dots that may be placed on E horizontal dot positions
F is number of vertical dots for uppercase symbols
G is number of dots available for descenders

B *Standard ASCII Character Set*



B7 B6 B5 / BITS B4 B3 B2 B1	ROW	0 0 0 COLUMN 0		0 0 1 1		0 1 0 2		0 1 1 3		1 0 0 4		1 0 1 5		1 1 0 6		1 1 1 7	
0 0 0 0	0	NUL	0 0 0	DLE	20 16 10	SP	40 32 20	0	60 48 30	@	100 64 40	P	120 80 50	`	140 96 60	p	160 112 70
0 0 0 1	1	SOH	1 1 1	DC1 (XON)	21 17 11	!	41 33 21	1	61 49 31	A	101 65 41	Q	121 81 51	a	141 97 61	q	161 113 71
0 0 1 0	2	STX	2 2 2	DC2	22 18 12	"	42 34 22	2	62 50 32	B	102 66 42	R	122 82 52	b	142 98 62	r	162 114 72
0 0 1 1	3	ETX	3 3 3	DC3 (XOFF)	23 19 13	#	43 35 23	3	63 51 33	C	103 67 43	S	123 83 53	c	143 99 63	s	163 115 73
0 1 0 0	4	EOT	4 4 4	DC4	24 20 14	$	44 36 24	4	64 52 34	D	104 68 44	T	124 84 54	d	144 100 64	t	164 116 74
0 1 0 1	5	ENQ	5 5 5	NAK	25 21 15	%	45 37 25	5	65 53 35	E	105 69 45	U	125 85 55	e	145 101 65	u	165 117 75
0 1 1 0	6	ACK	6 6 6	SYN	26 22 16	&	46 38 26	6	66 54 36	F	106 70 46	V	126 86 56	f	146 102 66	v	166 118 76
0 1 1 1	7	BEL	7 7 7	ETB	27 23 17	'	47 39 27	7	67 55 37	G	107 71 47	W	127 87 57	g	147 103 67	w	167 119 77
1 0 0 0	8	BS	10 8 8	CAN	30 24 18	(	50 40 28	8	70 56 38	H	110 72 48	X	130 88 58	h	150 104 68	x	170 120 78
1 0 0 1	9	HT	11 9 9	EM	31 25 19	)	51 41 29	9	71 57 39	I	111 73 49	Y	131 89 59	i	151 105 69	y	171 121 79
1 0 1 0	10	LF	12 10 0 A	SUB	32 26 1A	*	52 42 2A	:	72 58 3A	J	112 74 4A	Z	132 90 5A	j	152 106 6A	z	172 122 7A
1 0 1 1	11	VT	13 11 0 B	ESC	33 27 1B	+	53 43 2B	;	73 59 3B	K	113 75 4B	[	133 91 5B	k	153 107 6B	{	173 123 7B
1 1 0 0	12	FF	14 12 0 C	FS	34 28 1C	,	54 44 2C	<	74 60 3C	L	114 76 4C	\	134 92 5C	l	154 108 6C	|	174 124 7C
1 1 0 1	13	CR	15 13 0 D	GS	35 29 1D	-	55 45 2D	=	75 61 3D	M	115 77 4D	]	135 93 5D	m	155 109 6D	}	175 125 7D
1 1 1 0	14	SO	16 14 0 E	RS	36 30 1E	.	56 46 2E	>	76 62 3E	N	116 78 4E	^	136 94 5E	n	156 110 6E	~	176 126 7E
1 1 1 1	15	SI	17 15 0 F	US	37 31 1F	/	57 47 2F	?	77 63 3F	O	117 79 4F	_	137 95 5F	o	157 111 6F	DEL	177 127 7F

C Host Configurations and Drivers

HP3000 / MPE-V

MPE-V Typical Configuration

LOGICAL DEVICE #?	Provided by CE	
DEVICE NAME?	HPPCLATP	For use with ATP
	HPPCLADCC	For use with ADCC
	HPLPATP	For use with ATP
	HPLPADCC	For use with ADCC
DRT #?	Provided by CE	
UNIT #?	Provided by CE	
SOFTWARE CHANNEL # = 0?		
TYPE = 32?		
SUB TYPE = 14?		
ENTER [TERM TYPE #], [DESCRIPTOR FILENAME] = 19?		
SPEED IN CHARACTERS PER SECOND = 240?		
RECORD WIDTH = 66?		
OUTPUT DEVICE = 0?		
ACCEPT JOB/SESSIONS = N?		
ACCEPT DATA = N?		
INTERACTIVE = N?		
DUPLICATIVE = N?		
INITIALLY SPOOLED = Y?		
AUTO REPLY = N?		
DRIVER NAME	= HIPASLP0	For use with ATP
	= HIOASLP2	For use with ADCC
DEVICE CLASSES = LP?	User’s choice	

HP3000 / MPE-XL / MPE / iX

MPE-XL / MPE / iX Typical Configuration

Within NMMGR follow the menu:
Open Config
DTS
Go to Profiles
Add or
Modify

Printer Type [18]	(18, 21, 22, or 26)
or Printer Type File Name _____	
Line Speed [9600]	(300 through 38400)
Record Width [132]	(1 . . . 2048 bytes)
Modem Type [0]	(0-None, 1-US, 2-Europe)
Parity [NONE]	(None, Even, Odd, 0's, 1's)
Initially Spooled [Y]	(Y,N)

Device Class . . . user's choice
Save Data
Prior Screen . . . twice
Go to DTC
Config Card
Assign Profile to LDEV
Save Data
Validate Link/DTX

After successful Validation, run SYSGEN to cross-validate the DTS configuration with the system configuration. In order for any TIO changes to take effect, you must reboot the system.

Within SYSGEN
sysgen> io
io> LD
io> HO
sysgen> K . . . (Keep configuration)

HP9000 / HP-UX®

HP-UX Typical Configuration

Printers set up on HP-PB & CIO computers

Table 16. Drivers Required

Interface	HP-PB	CIO 6 CHANNEL MUX	CIO 16 CHANNEL MUX
Serial	mux2	mux0,cio_ca0	mux0_16,cio,ca0
Parallel	lpr2	N/A	N/A

The Drivers shown in this table should be installed in the Kernel Configuration.

Configuration Guidelines

Within SAM follow the menu:

Printers and Plotters
Printers/Plotters
Printer/Plotter Manager menu ... select Actions
Add Local Printer/Plotter
Add parallel Printer/Plotter or
Add serial Printer/Plotter

If parallel printer is selected:

Printer Name	user's choice
Printer Model Interface	user's choice
Printer Device File Name	SAM creates a special file
Printer Class	user's choice

If serial printer is selected:

The system displays the Serial Interface Hardware Paths

Port	select a valid port
Printer Name	user's choice
Printer Model Interface	user's choice
Printer Device File Name	SAM creates a special file
Printer Class	user's choice

D *Paper Specifications*

Introduction

This appendix gives detailed specifications for selecting continuous-form paper and also identifies ribbon specifications.

These specifications will help you ensure the highest print quality and reliability of the printer. Particular brands of paper or ribbon are not recommended.

The LineJet printers use dot-matrix line printing technology, which permits a high degree of printing flexibility. The printing mechanism in the LineJet family of printers is a hammer bank containing from 28 to 91 hammer springs. The hammer bank is mounted in a shuttle assembly that oscillates horizontally to permit printing in every dot position on the page. Dot-matrix technology enables you to print graphic images, line draw characters, special characters, and multiple alphabets.

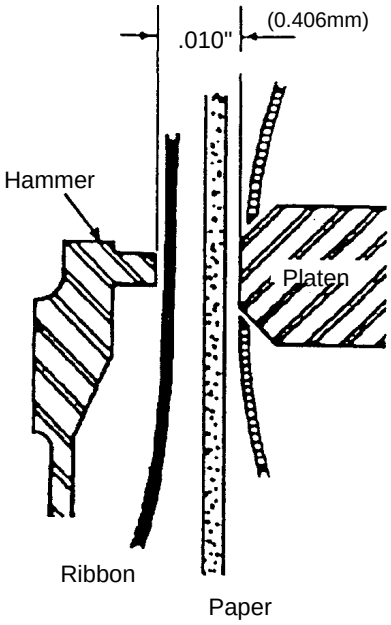
Dot-Matrix Versus Full Font Printers

A significant difference between dot matrix printers and full-font printers (chain-train, slug-train, and band printers) is the print gap. The print gap is the distance between a print hammer in its retracted position and the platen. While the hammers of full-font printers fire only once to form a character, the hammer of a dot-matrix printer fires an average of 13 times per character, and as many as 26 times to form a standard density character. The high repetition rates necessary to print dot-matrix images require a significantly smaller print gap. See Figure 10.

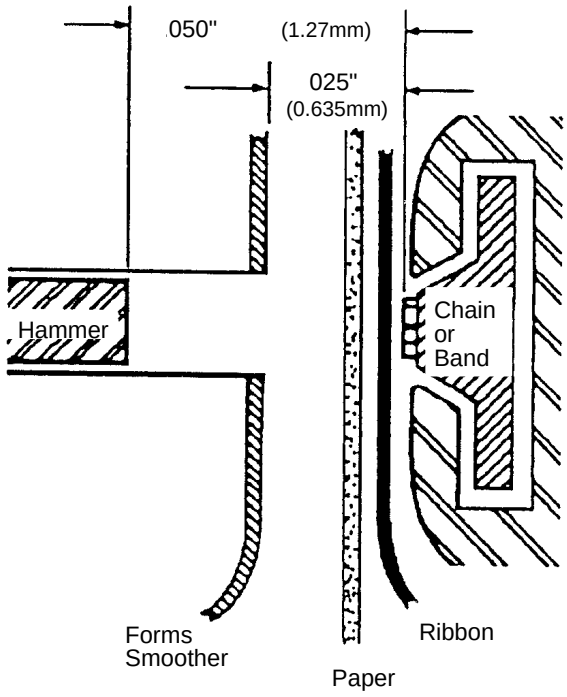
For most standard paper and multi-part forms, the smaller print gap of dot-matrix printers presents no problems. However, some specialty forms that perform satisfactorily in full-font printers may cause unacceptable paper jam rates and print smearing when used in dot-matrix printers. This appendix will help you identify and buy paper that performs well in the Hewlett-Packard LineJet printer. This appendix will also help you work with the forms vendors in designing and buying forms that provide optimum print quality and paper stacking.

Note

Always test your paper and forms for proper print quality, paper feeding, and paper stacking before buying a large quantity.



HP Dot-Matrix Printer



Typical Full-Font Printer

Figure 10. Dot Matrix and Full Font Print Gap Comparison

General Paper Requirements

The printer uses continuous fan-fold, edge-perforated paper varying in width from 3.0 inches (7.62 cm) to 17 inches (43.18 cm). Although the printer accepts paper as wide as 17 inches, the farthest right it can print is 15.2 inches (38.6 cm). The printer will handle paper weights of 15 to 100 pounds (6.80 to 45.36 kg), with 18 to 60 pounds as the optimum weight range.

Test the paper first if it will be used in environments with greater than 80% or less than 20% humidity. If paper will be used at high humidity, test it for satisfactory feeding and handling. If paper will be used at low humidity, test it to determine if static buildup must be eliminated for proper paper stacking.

In general, any special application paper, such as multi-part forms, labels, etc., should be tested in the printer prior to purchase.

Paper Specifications

This section describes the paper specifications that must be met to ensure optimum printer performance.

Hewlett-Packard conforms to ANSI® Standard X3.96-1983, “American National Forms Information Systems for Continuous Business Forms,” and ISO Recommendation No. 2784, which cover common form widths and depths, standards for sprocket feed holes and margins, and other basic tolerances.

Make all measurements at 20 to 26 degrees C (68 to 78 degrees F) and 45 to 55 percent relative humidity.

Standard Forms Specifications

The Hewlett-Packard LineJet printers perform adequately with forms that meet the following specifications:

Paper Sizes

Maximum Form Width	16.0 inches (40.64 cm) edge-to-edge
Minimum Form Width	3.0 inches (7.62 cm) edge-to-edge
Maximum Left Margin	0 to 13.5 inches (0 to 34.29 cm)
Maximum Right Margin	1 to 13.6 inches (2.54 to 34.54 cm)
Maximum Printing Width	13.6 inches (34.54 cm)
Maximum Form Length	16 inches (40.64 cm)
Minimum Form Length	2 inches (5.08 cm)

Paper Weights

Single Part Forms:	
Standard	15 to 100 pound (57 to 380 gm/meter$^{2)}$
Optimum Print Quality	18 to 80 pound (68 to 304 gm/meter$^{2)}$
Optimum Paper Stacking	20 to 80 pound (76 to 304 gm/meter$^{2)}$

Multi-Part Forms:	
Carbon Paper	12 pounds (46 gm/meter^2) up to 6 total pages
Carbons	8 pounds (30 gm/meter^2) up to 6 total pages
Pack Thickness	Maximum 0.025 inch (0.0635 mm) total
Carbonless	Up to 4-part forms

Standard line printer paper purchased from Hewlett-Packard meets the above specifications and will perform well in the printer. Paper purchased from other sources will also provide satisfactory results. For forms other than single-part or simple carbon-type multi-part forms, refer to the next section, “Specialty Forms Specifications.” The forms used in the printer should not vary in thickness across the printable surface.

Specialty Forms Specifications

Due to variations in manufacturing processes, quality, and composition of forms, Hewlett-Packard cannot guarantee satisfactory performance with all paper and forms. This section will alert you to some of the characteristics of specialty forms that can cause unsatisfactory printer performance. The information in this specification, however, is NOT a substitute for actual testing.

Note

Always test specialty forms (including special single-part paper, multi-part forms, forms with glue strips, carbonless forms, card stock, and labels) for satisfactory feeding, registration, and print quality prior to purchase.

Recycled Paper

Recycled paper is a combination of waste paper, pre-consumer waste, and post-consumer waste. Printed paper is usually washed to remove most of the inks and other contaminants. Recycled paper may contain dark specks or appear gray or dirty. You should choose a recycled paper that meets the same specifications as standard paper and that has an appearance suitable for your needs. Hewlett-Packard recommends that recycled paper contain no more than 5% ground wood.

Forms Thickness Uniformity

Because of the small print gap in dot-matrix line printers, they are less tolerant of forms thickness variations than are full-font printers. Some thickness variations are caused by defects such as bubbles or wrinkles. Other thickness variations are due to varying paper composition or to a variable number of parts within the form.

Nominal differences in thickness and compressibility make it impossible to specify allowable thickness variations exactly. Use the following cases as a guide, but be sure to test all forms that have thickness variations. (In the cases that follow, T = maximum thickness.)

Case 1: Form Defect

To avoid hammer dragging, the overall thickness of a form plus any defects should not exceed the measurement shown in Figure 11. (0.015 + T/2 inch.)

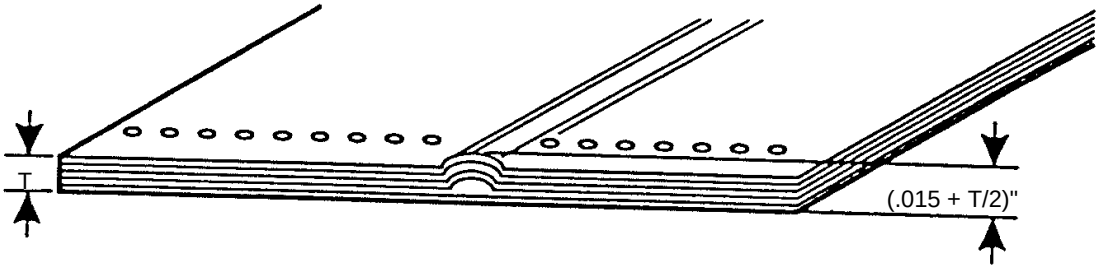


Figure 11. Maximum Height of Form Defects

Case 2: Varying Thickness Forms: Printing on All Areas

To ensure satisfactory print quality on all areas of the form, the difference in thickness between the thickest and thinnest section of the form should be no more than 0.008 inch, as shown in Figure 12. Adjust the print gap to optimize print quality on all thicknesses of the form. Because dot-matrix printing is optimized at a single gap size, print quality can be compromised in some cases when printing on forms of varying thickness. This is especially true on the copy sheets of multi-part forms. When printing on forms of varying thickness, the maximum depth of depression defects on the thick part of the form is also 0.008 inch.

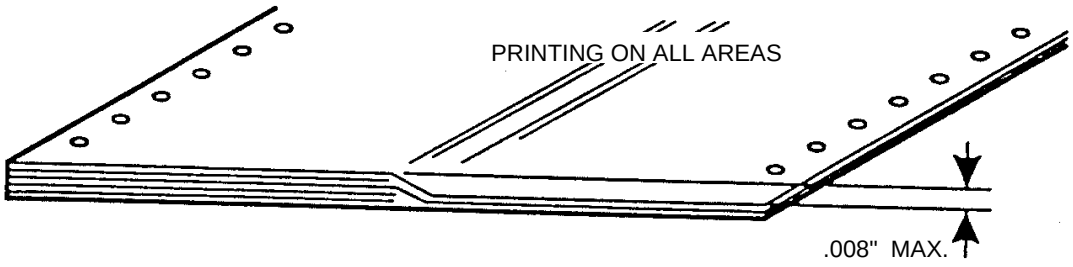


Figure 12. Maximum Thickness Variations for All Areas of a Special Form

Case 3: Varying Thickness Forms: Printing on Thin Areas

To avoid print smearing on the thickest area of the form when printing on the thin area only, the difference in thickness between the thinnest area and the thickest area should be no more than that shown in Figure 13. (0.015 - T/2 inch.) For forms with larger variations in thickness, the print gap can be opened beyond the optimum gap in order to reduce smearing, but print quality on the thinner areas will degrade accordingly.

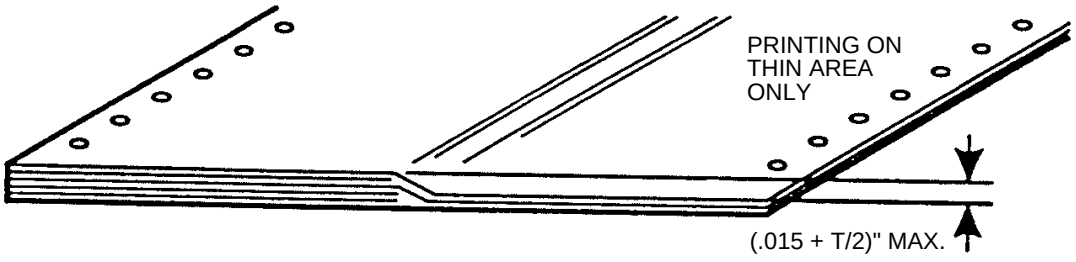


Figure 13. Maximum Thickness Variations for Thin Areas of a Special Form

Case 4: Varying Thickness Forms: Printing on Thickest Areas

In this case, as long as the thickest area of a form does not exceed the specifications listed (see “Paper Weights” on page 139), there is no lower limit to the thickness of the thinnest area, as long as it is sufficient to support the form as it is fed through the printer.

Perforation Projection

Perforation projection (or perforation tent) is measured by laying the form on a flat surface, as shown in Figure 14. Perforation projections exceeding the value shown (0.015 + T/2 inch) can result in excessive smearing at the perforations or an unacceptable jam rate. This happens because the perforations can snag on the hammers as the paper slews through the print area. Opening the print gap will reduce smearing or jamming, but may also degrade print quality.

Paper crimps should not come loose and tails should not show. If these occur, they will catch on the inward fold and cause paper jams.

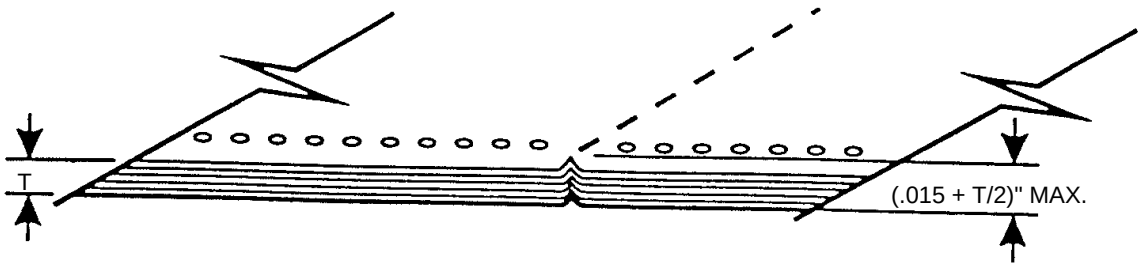


Figure 14. Maximum Allowable Form Perforation Projection

Other Special Forms

Forms with windows, cutouts, flaps, or attached cards, and other specialized forms may jam excessively in the printer. The only way to ensure satisfactory performance of these forms is to test them thoroughly before purchase.

Labels

Most standard labels work well in the printer, as long as they meet the specifications outlined in “Standard Forms Specifications” on page 139. However, due to variations in the label products offered, test all label stock thoroughly before purchase.

Carbonless Forms

When using carbonless forms, poor print quality can be a result of the forms. The following considerations can result in poor print quality:

- Shelf life of the form is past
- The chemical coating on the form is not evenly distributed
- Certain chemicals have longer development times. (Development time of 24 hours after printing is usual for carbonless forms.)

Conclusion

It is impossible to test all possible types of forms available for use in the printer; therefore, Hewlett-Packard recommends that paper conform to the specifications outlined in this appendix for optimum printer performance.

Paper Storage and Handling

The performance of the printer depends on the condition of the paper used; therefore, the following recommendations for packaging, handling, and storage are included in this appendix.

Packaging

To avoid damage during handling, use top and bottom fillers in continuous form cartons to hold the paper stack firmly in place. Because the physical condition of the paper affects printer reliability, proper packaging ensures that the paper remains flat and is not damaged along the edges.

Storage

Do not store cartons directly on the floor, and do not stack cartons more than six high. Set each carton upright and squarely on the one underneath. Do not place anything else on the stack of paper, as this can damage the paper.

Preconditioning Forms

Performance is also affected by the printing environment. Protect paper from temperature and humidity extremes. Store paper in the same environment as the printer for 48 hours before the paper is used. This conditioning allows the moisture content of the paper to stabilize.

LineJet printers are used in a controlled environment. This environment consists of temperatures from 10° to 40° C (50° to 104° F) up to 1524 meters (5000 feet), from 10° to 32° C (50° to 90° F) up to 2438 meters (8000 feet), with a relative humidity of 5% to 80% non-condensing. For best results, however, store the paper cartons at 18° to 24° C (65° to 75° F), with a relative humidity of 40% to 50%.

If the printer is in an environment subject to extremes of temperature or humidity, store the forms in a better controlled environment and move them to the printer location as needed.

Shipping

When shipping paper through different environments, wrap the entire palletized stack in plastic. When shipping paper across bodies of water, wrap each individual carton as well.

E Downloading Firmware

Loading Flash Memory

Flash memory is contained in SIMMs (single in-line memory modules) located on the controller board. Printer emulation and operating system software are loaded into flash memory at the factory, but you will install software in some situations:

- You buy the IGP/PGL or Code V graphics option after the printer is installed
- You need to upgrade printer software
- You need different emulation software
- You have replaced the controller board
- You have added or replaced the flash memory SIMM

Emulation and operating system software are stored as compressed files on more than one 3.5 inch floppy diskette. You will recombine the multiple files from the diskettes into one file on your computer's hard disk in order to download the file to the printer. To assist in this process, the MS-DOS® based program PKUNZIP® is included on the last diskette with the program file.

You can load software through either the serial or parallel port of the printer. The load commands are different, depending on the printer port you use. These differences are explained in the note following step 26.

1. Make a printout of *all* saved configurations. (Refer to "Printing the Current Configuration" on page 34.) Installing new software erases all saved configurations. You will use the printouts to restore printer configuration.
2. Set the printer power switch to O (off).
3. If the printer is already connected to the serial or parallel port of a computer capable of running an MS-DOS based PKZIP self-extracting file, go to step 9. If not, go to step 4.
4. Unplug the AC power cord from the printer.
5. Disconnect all data input cables from the printer interface. If the printer has an internal Ethernet interface card, do the following:
   a. Cabinet models: remove the paper path
      Pedestal models: remove the top cover assembly
      (refer to your *Maintenance Manual*).
   b. Unplug the Centronics I/O cable from the Ethernet interface card.
   c. Secure the loose end of the Centronics I/O cable to prevent the connector from contacting any other exposed components.

d. Attach the parallel cable connector from the computer to the Centronics I/O connector.

6. Connect a parallel data cable to the LPT1 port or a serial data cable to the COM1 port of an IBM-compatible computer that is using the PC-DOS™ or MS-DOS operating system.

NOTE: You can connect the cable to the LPT2 port if the LPT1 port is already in use. The load commands are different if you use this port, as described in the note after step 26.

7. Connect the data cable to the appropriate I/O port of the printer.
8. Plug the AC power cord into the printer.
9. Power on the computer.
10. Create a directory on your computer hard drive where you will store the recombined files from the emulation diskettes by typing the following at the DOS prompt:

    MD DOWNLOAD<return>

11. Make the newly created directory the “active” directory by typing the following at the DOS prompt:

    CD DOWNLOAD<return>

12. Insert the last diskette in the series (e.g., 2 of 2, 3 of 3, etc.) into diskette drive A (or B) of the computer.
13. Get the name of the compressed file on the diskette by typing the following at the DOS prompt:

    DIR A:<return> (If the diskette is in drive B, type DIR B:<return>)
    The compressed file on the diskette takes the form *FILENAME.ZIP*, where the filename is a six digit number (e.g., 123456.zip).

14. At the DOS prompt type:

    A:\PKUNZIP A:*FILENAME* (Replace A: with B: if you are using the B dirve), where *FILENAME* is the six digit number you noted in the previous step.

15. The PKUNZIP program will execute, and the following message will appear on the computer screen:

    Insert disk #1 - Press a key when ready

16. Remove the diskette in the disk drive and insert the diskette labeled

    Disk 1 of 2 (or 1 of 3, etc.)

17. Press the <return> key. After the file is decompressed to the hard drive, the following message will appear on the computer screen:

    Insert disk #2 - Press a key when ready

18. Remove the diskette in the disk drive and insert the diskette labeled

    Disk 2 of 2 (or 2 of 3, etc.)

19. Press the <return> key. If there are only two diskettes for the emulation, you will be returned to the DOS prompt when the decompression is complete. If there are three diskettes, you will be asked to insert disk #3 and press a key.

20. When all diskettes have been decompressed, type the following at the DOS prompt:

    DIR<return>
    You will see a directory listing containing the file ***FILENAME.EXE***, where the filename is the six digit number (e.g., 123456.exe) you noted above. **This is the file you will download into the printer.**

21. On the printer control panel, press and hold down the **ON LINE + PAPER ADVANCE** keys. Without releasing the keys, power the printer on. Continue holding the **ON LINE** and **PAPER ADVANCE** keys down.

22. When you see "WAITING FOR PROGRAM DOWNLOAD" on the LCD, release the **ON LINE** and **PAPER ADVANCE keys.**

NOTE: The port default is CENTRONICS; this is the standard load through the parallel port. If you want to use the default, continue at step 18.

23. Press the ▸ **(NEXT)** key; "SELECT DOWNLOAD PORT=DATAPRODUCT" appears on the LCD.

24. Press ▸ **(NEXT)** again to cycle through the download ports available in the printer:

    DATAPRODUCT (parallel)
    CENTRONICS* (parallel) (default port)
    RS232-9600 (RS-232 serial, 9600 baud)
    RS232-19.2K (RS-232 serial, 19200 baud)
    RS232-38.4K (RS-232 serial, 38400 baud)
    RS232-115K (RS-232 serial, 115000 baud)
    RS422-9600 (RS-422 serial, 9600 baud)
    RS422-19.2 (RS-422 serial, 19200 baud)
    RS422-38.4K (RS-422 serial, 38400 baud)
    RS422-115K (RS-422 serial, 115000 baud)

25. When the printer download port you want to use is displayed on the LCD, press **ENTER.** "WAITING DOWNLOAD / PORT = <*your selection*> appears on the display.

26. At the DOS prompt on the computer type:

    FILENAME.EXE -pb<return>
    where FILENAME.EXE is the compressed file you noted in step 20. This command decompresses the file on the hard drive and copies it as a binary file into the flash memory on the printer controller board.

NOTE: If you are loading the file using the LPT2 port on the computer, enter the following DOS command:
FILENAME.EXE -pb 2 <Return>

The 9600 baud rate is the only selection older versions of DOS can use. The baud rate information entered in the following DOS commands must match the selection you made in step 25.

If you are loading the file through the printer serial port, enter the following DOS commands:
MODE COM1:9600,N,8,1,P<Return>
FILENAME.EXE -pbc1<Return>

27. While the file is copied into memory, the printer LCD informs you of the load process and status. (LCD messages are listed in Table 17.)
28. When the new program has successfully loaded into memory and the printer has reset itself, set the printer power switch to O (off).
29. Unplug the AC power cord from the printer.
30. Remove the diskette from the computer and store it with the printer.
31. Power off the computer.
32. If you had to install a data cable to the computer and printer in step 6, disconnect it from the computer and printer.
33. Reconnect the customer's data input cable(s) to the printer, if required.
34. Return the printer to normal operation.
35. Using the configuration printout(s) you made in step 1, reconfigure the printer.

Table 17. Flash Memory Message Guide

Message	Explanation	Required Action
CLEARING PROGRAM FROM FLASH	The program successfully loaded into printer RAM and the checksum matched. The old program is now being deleted from flash memory.	None
DIAGNOSTIC PASSED	The printer passed its memory and hardware initialization tests.	None
ERROR: DC PROGRAM NOT VALID	Printer cannot find the data controller program or the validation checksum is corrupt.	Download the program again. If the message occurs again, call your service representative.
ERROR: DRAM AT ADDRESS XXXXXXXX	The printer found a defective memory location.	Call your service representative.
ERROR: EC PROGRAM NOT VALID	Printer cannot find the engine controller program or the validation checksum is corrupt.	Download the program again. If the message occurs again, call your service representative.
ERROR: EC STOPPED AT STATE XXXX	Hardware fault in the engine controller.	Call your service representative.
ERROR: FLASH DID NOT PROGRAM	The printer encountered an error trying to program flash memory.	Download the program again. If the message occurs again, call your service representative.
ERROR: NO DRAM DETECTED	The printer could not find any DRAM.	Call your service representative.

Table 17. Flash Memory Message Guide (continued)

Message	Explanation	Required Action
ERROR: FLASH NOT DETECTED	The printer could not find any flash memory.	Call your service representative.
ERROR: NVRAM FAILURE	The security PAL is not present or the non-volatile memory has failed.	Call your service representative.
ERROR: PROGRAM NEEDS MORE DRAM	The printer requires more DRAM memory in order to run the downloaded program.	Add DRAM. Call your service representative.
ERROR: PROGRAM NEEDS MORE FLASH	The printer requires more flash memory in order to run the downloaded program.	Add flash memory. Call your service representative.
ERROR: PROGRAM NOT COMPATIBLE	The printer is not compatible with the downloaded program.	Use the correct emulation software option(s) for this model.
ERROR: PROGRAM NOT VALID	The printer does not see a program in flash memory.	There is no program in printer memory. Download program again.
ERROR: SECURITY PAL NOT DETECTED	The security PAL is not present or has failed.	Call your service representative.
ERROR: SHORT AT ADDRESS XXXX	Hardware failure in DRAM or CMX controller circuitry.	Call your service representative.
ERROR: WRITING TO FLASH	Hardware or software fault in flash memory.	Download the program again. If the message occurs again, call your service representative.
ERROR: WRONG CHECKSUM	The printer received the complete program but the checksum did not match. The data were corrupted during download.	Download the program again. If the message occurs again, call your service representative.
LOADING PROGRAM FROM PORT XX%	The new program is loading into printer RAM. XX indicates how much of the program has loaded.	None
LOADING PROGRAM INTO FLASH	The printer has deleted the previous program from flash memory and is loading the new program into flash memory.	None
RESETTING . . . PLEASE WAIT	The printer finished loading the program into flash memory and is automatically resetting itself.	None

Table 17. Flash Memory Message Guide (continued)

Message	Explanation	Required Action
RESTORING BOOT CODE	Normal download initialization message.	None
SECURITY CODE VIOLATION	The software running or being downloaded does not match the security PAL code.	Call your service representative.
SENDING PROGRAM TO EC PROCESSOR	The printer is loading the engine controller program into the engine controller.	None
TABLE MISMATCH DOWNLOAD AGAIN	EC software update in progress.	Download the program again.

F Glossary

A

active column	The horizontal location on the paper where the next character will print.
active line	The vertical location on the paper where the next character will print.
active position	The position on the paper where the next character will print. The intersection of the active column and the active line.
ASCII	*Abbrev. for* American Standard Code for Information Interchange. A standard character encoding scheme introduced in 1963 and used widely on many computers and printers. It is a 7-bit code with 128 different bit patterns. There is no parity recommendation.
attributes, print	Operations performed on text that alter its appearance but do not change the font. Examples: underlining, superscripting, bold, etc.

B

bar code	A printed code consisting of parallel bars of varied width and spacing and designed to be read by a one-dimensional scanning device.
baud	A unit of speed that measures the rate at which information is transferred. Baud rate is the reciprocal of the length in seconds of the shortest pulse used to carry data. For example, a system in which the shortest pulse is 1/1200 second operates at 1200 baud. On RS-232 serial lines, the baud rate equals the data flow rate in bits per second (bps). To communicate properly, a printer must be configured to operate at the same baud rate as its host computer.
bold	A print attribute specifying text of a heavy line thickness. *See also* character weight.
buffer	A reserved area in memory where data is written and read during data transfers.
bus	A circuit for the transfer of data or electrical signals between two devices.

C

character cell The invisible rectangular space occupied by a character, including the white space around the character. The height of a cell remains constant even with changes in the current line spacing, and the width is equal to the current character spacing. Used as a unit of spacing.

character proportion The ratio of character height to character width. *See also* compressed and expanded.

character set A set of codes, each of which represents a printable character, including symbols, punctuation, numbers, diacritical markings, and alphabet characters. Each character is assigned a unique code value.

character weight The degree of lightness and thickness of printed text. For example: **"Bold" refers to a heavy or thick character weight.** "Medium," "normal," or "book weight" refer to the character weight used in this sentence.

checksum A stored or transmitted numerical value used to verify data integrity.

command sequence Two or more bytes that instruct the printer to perform a special function. The first character in the sequence is a special function control character (SFCC), which alerts the printer that the string is a command sequence. *See also* escape sequence, SSCC, *and* SFCC.

compatibility The ability of one printer to accept and properly process commands meant for a different printer. *See also* emulation *and* protocol.

compressed Refers to a typeface with a font width approximately 60% smaller than normal. Character height is not changed.

configuration Refers to the operating properties that define how the printer responds to signals and commands received from the host computer at the printer interface. These properties are called configuration parameters and must be set to match the operating characteristics of the host computer system.

controller An independent logic unit in a data processing system that controls data paths between the central processing unit and one or more units of peripheral equipment.

cpi *Abbrev. for* characters per inch. A measurement of monospaced fonts indicating the horizontal character density. For example, 10 cpi means 10 characters can be printed in one horizontal inch. *See also* pitch.

cps *Abbrev. for* characters per second. A measurement of the print speed of a serial (character or matrix) printer.

D

decipoint One tenth of a point. A unit of length equal to 1/720 inch. *See also* point.

default A value, parameter, attribute, or option assigned by a program or system if another is not specified by the user.

descender The portion of a printed, lowercase character that appears below the base line. For example, “g,” “j,” “p,” “q,” and “y” all are characters with lowercase descenders.

diagnostic Pertains to the detection and isolation of printer malfunctions or mistakes.

DIP *Acronym for* dual in-line package. A method of packaging semiconductor components in rectangular cases with parallel rows of electrical contacts (pins).

DIP switch A DIP equipped with switches. A typical DIP switch has from four to ten individual switches mounted in its package. The individual switches are typically toggle, rocker, or slide switches.

disable To deactivate, make “false” (0), or set to OFF.

DP *Abbrev. for* data processing font (*see* HS).

E

EIA/TIA Electronics Industries Association.

Elite A name indicating a monospaced font with a pitch of 12 cpi (and usually 10 points in height).

em A unit of measure in typesetting: the width of a piece of type about as wide as it is tall. (Derived from uppercase M, usually the widest character in a set.)

emulation Refers to the ability of a printer to execute the commands of another printer language (protocol).
See also compatibility *and* protocol.

en A unit of measure in typesetting equal to half the width of an em.

enable To activate, make “true” (1), or set to ON.

escape sequence A command sequence in which the first byte is always the ASCII ESC character.
See also command sequence, SSCC, *and* SFCC.

expanded Refers to a typeface with a font width larger than normal. Character height is not changed.

F

family (or type) A set of all variations and sizes of a type style.

fixed-pitch fonts *See* font, monospaced.

font The complete set of a given size of type, including characters, symbols, figures, punctuation marks, ligatures, signs, and accents. To fully describe a font, you must specify seven characteristics:
1) typeface (Courier, Helvetica, Swiss, etc.)
2) spacing (proportional or monospaced)
3) type size (12 point, 14 point, etc.)
4) scale factor (character height/width ratio)
5) type style (Roman or italic)
6) character weight (bold, normal, etc.)
7) character proportion (normal, compressed, expanded).

font, monospaced Also called fixed-pitch font and mono-font. Every character, regardless of horizontal size, occupies the same amount of font pattern space. All monospaced fonts use specific pitch size settings. Monospaced fonts are sometimes used when strict character alignment is desired (tables, charts, spreadsheets, etc.).

font name *See* typeface.

font pattern A font pattern is the matrix of pixels which represents a character, symbol, or image.

font, proportional A font in which the width of a character cell varies with the width of the character. For example, [i] takes less space to print than [m]. Using proportional fonts generally increases the readability of printed documents, giving text a typeset appearance.

font weight The thickness of the lines making up a character. For example, “bold” and “light” are different font weights.

font width The measurement of the width of a character cell in dots.

H

hex codes Codes based on a numeral system with a radix of 16.

host computer The computer that stores, processes, and sends data to be printed, and which communicates directly with the printer. The term “host” indicates the controlling computer, since modern printers are themselves microprocessor-controlled computer systems.

HS *Abbrev. for* high speed font.

Hz	*Abbrev. for* Hertz. Cycles per second, a measure of frequency.

I

IEEE	Institute of Electrical and Electronic Engineers, Inc.
IGP	Intelligent Graphics Processor. An interface that converts graphics commands received from the host computer to binary plot data that is usable by the printer.
initialization	A series of processes and self-tests to set power-up default conditions and parameters.
interface	The hardware components used to link two devices by common physical interconnection, signal, and functional characteristics.
invoke	To put into effect or operation.
ipm	*Abbrev. for* inches per minute. A measurement of the speed of a printer printing in graphics print mode (plotting speed).
italic	A slanted type style. *This is an italic type style.*

L

landscape	Printed perpendicular to the paper motion.
LCD	*Abbrev. for* liquid-crystal display. The LCD is located on the control panel. Its purpose is to communicate information to the operator concerning the operating state of the printer.
LED	*Abbrev. for* light-emitting diode. The printer control panel has LEDs that indicate the status of the printer to the operator.
logical link	The parameters that specify data transfer, control, or communication operations.
lpi	*Abbrev. for* lines per inch. A measurement indicating the vertical spacing between successive lines of text. For example, 8 lpi means eight lines of text for every vertical inch.
lpm	*Abbrev. for* lines per minute. A measurement of the print speed of a line printer printing in text print mode.

M

monospaced	*See* font, monospaced.

N

NLQ — *Abbrev. for* near letter quality font.

O

OCR — *Abbrev. for* optical character recognition. A process by which a machine can “read” characters printed in a special standardized font. Data are read by a photoelectric optical scanner and can be recorded on magnetic tape or disk. OCR-A and OCR-B are two widely used OCR fonts.

P

parity (check) — Parity checking is the addition of non-data bits to data, resulting in the number of bits that are set to a “1” being either always even or always odd. Parity is used to detect data errors.

PCBA — *Abbrev. for* printed circuit board assembly.

pica — A name indicating a monospaced font with a pitch of 10 cpi (and usually 12 points in height). Pica is also used in typography as a unit of measurement equal to 1/6 inch.

pitch — The number of text characters printed per horizontal inch. Specified in characters per inch (cpi).
See also cpi.

pixel — *Derived from* picture (PIX) ELement. The smallest displayable picture element on a video monitor or printable unit. In printing, a pixel is a dot.

point — A unit of length in printing and typography, used to specify type sizes, heights of font characters, etc. There are 72 points in a vertical inch; thus, one point equals 1/72 inch, or approximately 0.0139 inch. Some examples of point sizes are: This is 8 point type. This manual is printed in 10 point type.
This is 14 point type.

port — A channel used for receiving data from or transmitting data to one or more external devices.

portrait — Printed parallel to the short edge of a page.

print mode — Font.

proportion, character — *See* character proportion.

proportional — *See* font, proportional.

protocol — A set of rules or conventions governing the exchange of information between computer systems, or between a printer and a host computer. For computer printers, a protocol is the coding convention used to convey and print data. A printer protocol includes codes for printing text and graphics, as well as codes instructing the printer to perform special operations, and machine-to-machine communication codes.
See also compatibility *and* emulation.

R

RAM — *Acronym for* random-access memory. Also called “main memory” or “working memory.” RAM is the active memory of a printer, into which programs are loaded. This memory can be read from or written to at any time. RAM is also termed “volatile” because whatever information is in RAM is lost when power is turned off or interrupted.
See also ROM.

read — To retrieve data from memory (RAM) or from mass storage (hard disk, floppy diskette, etc.).

reset — To turn off, deactivate, disable, or return to a previously determined state.

resolution — A measure expressing the number of component units in a given range used to create an image. In printing, this is expressed as the number of dots per inch (dpi) horizontally and vertically.

ROM — *Acronym for* read-only memory. Programs, instructions, and routines permanently stored in the printer. Information in ROM is not lost when power is turned off. ROM cannot be written to-hence the term “read-only.”
See also RAM.

roman — A type style in which the characters are upright. This sentence is printed in a roman type style.

S

serial communications — The sequential transmission of data, in which each element is transferred in succession.

set — To turn on, activate, invoke, or enable.

SFCC	*Abbrev. for* special function control character. The first character in a printer command sequence. In P-Series emulation mode, you can select one of five characters as the SFCC. In Epson FX and Proprinter emulation mode, the SFCC must always be the ASCII ESC character. *See also* command sequence *and* escape sequence.
size, type	*See* point.
slewing	Rapid vertical paper movement.
spacing	*See* font, proportional *and* font, monospaced.
start bits	In serial data transfer, a signal indicating the beginning of a character or data element.
stop bits	In serial data transfer, a signal indicating the end of a character or data element.
string	Two or more bytes of data or code treated as a unit.
style, type	*See* type style.
symbol set	*See* character set.

T

type family	*See* typeface.
type size	*See* point.
type style	Refers to either the upright or italic character style in a specific font family. Roman is upright, *italic is slanted.*
typeface	A descriptive name or brand name that identifies a particular design of type. Examples are: Courier, Helvetica, and Swiss. Also called type family.
typographic font	*See* font, proportional.

V

VFU	*Abbrev. for* vertical format unit.

W

weight	*See* character weight.
write	To store data to memory (RAM) or to mass storage (hard disk, floppy diskette, etc.).

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