

EPSON[®]
ActionLaser[™] 1600

Reference Guide



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FCC COMPLIANCE STATEMENT FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These **limits** are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful **interference** to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the KC Certification of this device and may cause interference levels which exceed the Emits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this **equipment has more** than one interface connector, do not leave cables connected to **unused interfaces**.

Changes or modifications not expressly approved by Epson America, Inc., could void the user's authority to operate the equipment.

FOR CANADIAN USERS

This digital apparatus does not exceed the class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

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Getting Started

The Epson® ActionLaser™ 1600 printer combines high performance and reliability with a wide range of features.

To get started with your ActionLaser printer, please:

- ❑ Read the safety information, laser printer precautions, and important safety instructions in this introduction.
- ❑ Use your *Read This First* guide to set up and test your new printer.
- ❑ Refer to this *Reference Guide* for detailed information about your printer.

If you require additional assistance, see “Where to Get Help” below.

where to Get Help

Epson America provides local customer support and service through a nationwide network of authorized Epson dealers and Service Centers.

If you need to call for technical assistance, please print a status sheet and have it handy. See Chapter 4 for information on printing a status sheet.

Epson also provides the following support services through Epson Connectionsm at (800) 922-8911:

- ❑ Assistance in locating your nearest Authorized Epson Reseller or Service Center
- ❑ Technical assistance with the installation, configuration, and operation of Epson products

- ❑ Epson technical information library fax service
- ❑ Product literature with technical specifications on Epson's current and new products
- ❑ Sales of supplies, parts, documentation, and accessories for your Epson product
- ❑ Customer Relations

CompuServe® On-line Support

The fastest way to access helpful tips, specifications, drivers, application notes, and bulletins is through the Epson America Forum on CompuServe.

If you are not currently a member of CompuServe, you are eligible for a free introductory membership as an owner of an Epson product. This membership entitles you to:

- ❑ An introductory \$15 credit on CompuServe
- ❑ Your own user ID and password
- ❑ A complimentary subscription to CompuServe *Magazine*, CompuServe's monthly publication

To take advantage of this offer, call (800) 848-8199 in the United States and Canada and ask for representative #529. In other countries, call (614) 529-1611 or your local CompuServe access number.

If you are already a CompuServe member, simply type GO EPSON at the menu prompt to reach the Epson America Forum.

Safety Information

laser safety

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

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

CDRH regulations

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

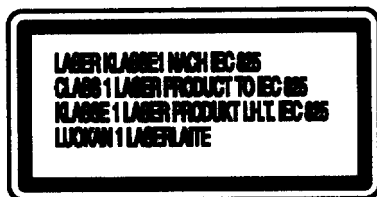
**This laser product conforms to the
applicable requirement of 21 CFR
Chapter 1, subchapter J.
SEIKO EPSON CORP.
Hirooka Office
80 Hirooka, Shiojiri-shi, Nagano-kan,
JAPAN
MANUFACTURED:**



Warning

Use of controls, adjustments, or performance of procedures other than those specified in this guide may result in hazardous radiation exposure.

Your printer is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.



Internal laser radiation

Max. Radiation Power 5.7×10^{-4} w

Wave Length 780nm

This is a Class IIb Laser Diode Assembly that has an invisible laser beam. The printer head unit is NOT A FIELD SERVICE ITEM. Therefore, the printer head unit should not be opened under any circumstance.

Ozone emission

During printer operation, a small amount of ozone is released. This amount is not large enough to affect human beings adversely.

However, it is best to make sure the room where you are using the printer has adequate circulation, especially when you are printing a high volume of materials or using the printer continuously over a long period of time.

Laser printer Precautions

This printer uses laser technology. The following list of precautions applies whenever you open the printer cover. Even if you are familiar with other types of printers, be sure to follow these precautions carefully to ensure safe, efficient operation.

- ❑ Be careful not to touch the fuser, which is marked by a CAUTION HOT SURFACE label. If the printer has been in use, the fuser can be very hot.
- ❑ Avoid touching the components inside the printer unless instructed to do so in this guide.
- ❑ Do not scratch the surface of the drum. Avoid touching the drum, since oils from your skin can permanently damage its surface and may affect print quality.
- ❑ Avoid pressing on the top of the imaging cartridge. Pressing directly on the cartridge may cause toner to spill into the printer. If there is a spill, see Chapter 6 for cleaning instructions.
- ❑ Never force the printer's components into place. Although the printer is designed to be sturdy, rough handling can damage it.

The imaging cartridge is the part of the printer mechanism that forms the image and transfers it onto the paper. Keep the following guidelines in mind whenever you handle the imaging cartridge:

- ❑ When removing the imaging cartridge, avoid exposing it to room light any longer than necessary. If you need to keep the cartridge out of the printer for long periods, cover it with a cloth. The imaging cartridge contains a light-sensitive drum, which is the green cylinder that can be seen through the openings of the cartridge. Exposure to light can damage the drum, causing dark or light areas to appear on the printed page and reducing the service life of the drum.
- ❑ Do not turn the cartridge upside down or stand it on its sides.
- ❑ Do not attempt to modify or take apart the cartridge. It cannot be refilled.
- ❑ Try not to touch the toner and avoid all contact with your eyes.
- ❑ Do not use a cartridge for at least one hour after moving it from a cool to a warm environment.

To get the best print quality from your imaging cartridge, do not store the cartridge in locations that are subject to direct sunlight, dust, salty air, or corrosive gasses (such as ammonia). Also avoid locations subject to high temperatures or humidity or abrupt changes in temperature or humidity.

Important Safety Instructions

1. Read all of these instructions.
2. Follow all warnings and instructions marked on the printer.
3. Unplug this printer from the wall outlet before cleaning. Use a damp cloth for cleaning and do not use liquid or aerosol cleaners.
4. Do not use this printer near water.
5. Do not place the printer on an unstable cart, stand, or table.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation. Do not block or cover them. Do not put the printer on a bed, sofa, rug, or other similar surface or in a built-in installation unless proper ventilation is provided.
7. Use the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding-type plug. This plug will only fit into a grounding-type outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
9. Do not put your printer where the cord will be walked on.
10. If you use an extension cord, make sure that the total of the ampere ratings on the products plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.

11. Never push objects of any kind through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the printer.
12. Except as specifically explained in this Reference Guide, do not attempt to service this product yourself. Opening or removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to service personnel.
13. Unplug this printer from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power cord or plug is damaged or frayed.
 - B. If liquid has been spilled into it.
 - C. If it has been exposed to rain or water.
 - D. If it does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - E. If it has been dropped or the cabinet has been damaged.
 - F. If it exhibits a distinct change in performance, indicating a need for service.

About this Guide

This guide contains information for using, operating, and maintaining the printer once it has been installed. For information about installing and setting up the printer, see the *Read This First* guide.

Chapter 1, "Using Your Printer," describes the printer's features and the printer's control panel, which allows you to access the printer settings. This chapter also contains a section that describes sharing the printer among multiple users.

Chapter 2, "Paper Handling," contains information on loading paper and setting up the printer for the type and size of paper that is loaded.

Chapter 3, "Fonts," provides basic information about fonts and tells you how to select and add fonts.

Chapter 4, "SelectType," describes the printer settings that can be modified by using SelectType™ in the control panel. Read this chapter if you are not able to modify a printer setting from your software.

Chapter 5, "Using Other Printer Emulations," describes the ESC/P2,™ FX, and GL/2 emulations. Read this chapter if you need to print documents formatted for dot matrix printers or if you are using a Hewlett-Packard® plotter application.

Chapter 6, "Troubleshooting and Maintenance," gives helpful information for what to do if you encounter a printer error.

Appendix A, "Technical Specifications," contains the technical specifications about the printer and the optional products that can be used with the printer.

Appendix B, "Command Summary," lists the commands that can be embedded in print jobs to control the printer. This appendix is intended for advanced users only.

Appendix C, "Option Installation," gives step-by-step installation instructions for the optional products that can be used with the printer.

Chapter 1

Using Your Printer



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About Your Printer

The ActionLaser 1600 is the latest in Epson's advanced line of laser printers, giving you high-quality printing that is both fast and quiet.

The imaging system is driven by a powerful RISC processor that speeds up processing and gives you the ability to mix text and graphics, create predefined forms, and print with a range of fonts normally associated with typeset material.

Features

The printer comes with a full set of features that contribute to consistently highquality output. This section lists the main features.



Energy Star Compliant

Your Epson ActionLaser 1600 printer complies with the U.S. Environmental Protection Agency's Energy Star program, which promotes the manufacture of energy-efficient printers, computers, and monitors. The ActionLaser 1600 conserves electricity by automatically entering a low-power, standby mode when not in use for fifteen minutes.

The EPA estimates that if all desktop computers, printers, and other peripheral devices met Energy Star standards, energy cost savings would exceed \$1 billion annually and carbon dioxide emissions would be reduced by 20 million tons.

All of Epson's dot matrix and ink jet printers conform to Energy Star standards, as do all ActionLaser printers produced after June, 1993.

The Energy Star emblem does not represent EPA endorsement of any product or service.

High, 600-dpi resolution

The printer can run in one of two resolutions: 300 dpi or 600 dpi. Both resolutions produce good-looking, crisp text and graphics. At 600 dpi, the resolution is exceptionally sharp because the dots that make up the text and graphics are smaller and more numerous than those used in 300-dpi resolution.

Generally all text and graphics look better when printed at 600 dpi. This is especially true for grayscale images since 600-dpi resolution allows a finer halftone screen to be applied, increasing the sharpness and clarity of the image. The higher resolution of 600 dpi also means that more gray shades can be represented, reducing the banding that is sometimes apparent at lower resolutions.

HP[®] LaserJet[®] 4 emulation and other emulation

The printer emulates the Hewlett-Packard LaserJet 4 (LJ4) printer. This allows for easy access to the great variety of software written for HP LaserJet printers.

Three other emulations are built in the printer: Epson ESC/P2, Epson FX, and Epson GL/2. These emulations provide compatibility with documents written for dot matrix printers or for HPGL/2[®] plotters. For more information about these emulations, see Chapter 5, "Using Other Printer Emulations."

Wide selection of built-in fonts

The printer comes with a selection of 45 scalable fonts, including 10 TrueType fonts, to provide you with the fonts you need to create professional-looking documents and publications.

Bi-Resolution Improvement Technology (Bi-RItech)

The RItech feature is an Epson printer technology that produces smoother, crisper lines, text, and graphics. RItech is available for both the 300- and 600-dpi resolutions. For more information about RItech, see Chapter 6.

Two built-in interfaces and optional interfaces

The printer comes equipped with two built-in interfaces: a Centronics® parallel interface and a serial interface that can be set to RS-232C or RS-422.

A variety of optional interfaces can also be installed. See Appendix C, “Option Installation.”

Optional accessories

In addition to the optional interfaces, you can add a wide range of additional accessories to further customize your printer:

- Faceup tray for straight-through feeding of envelopes, transparencies, and heavy paper stock.
- Additional 250-page paper tray to increase the paper capacity to 400 pages.
- Additional memory modules to allow you to print more complex text and graphics.
- Font cartridges for increasing the selection of fonts. Most HP-compatible cartridges work with your printer. For a list, see “Font Cartridges,” in Appendix C.

Controlling the Printer

In general, there are three ways to control the settings of your printer:

- ❑ The Printer Setup menu in your software
- ❑ The Printers icon in the Microsoft® Windows™ Control Panel
- ❑ The printer's front control panel buttons

Which way you use depends on the type of printer settings you want to change. The most commonly adjusted parameters, such as the number of copies, resolution, and orientation, can be changed from your software or from the **Printers** icon in the Windows Control Panel. For more information about changing printer settings from software, see the section "Controlling the Printer with Software" later in this chapter.

Some settings cannot be changed from software and some software might not allow you to control printer settings. In these cases, you can use the printer's control panel to adjust the printer settings.

Control Panel

The printer's control panel is used most often for the following:

- ❑ Viewing printer status and error messages
- ❑ Taking the printer on and off line
- ❑ Resetting the printer to factory settings or initializing the printer to clear print data
- ❑ Changing the printer settings that cannot be changed through software

SelectType mode

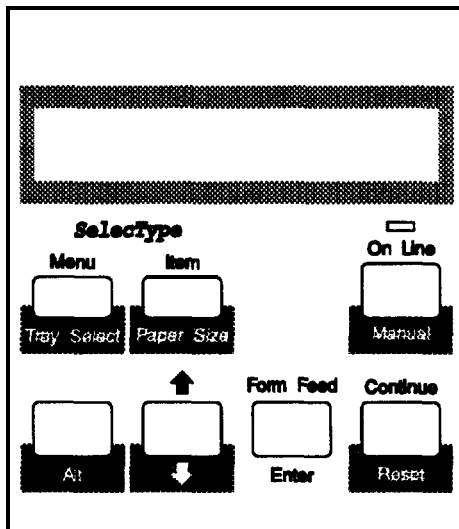
One of the functions of the control panel is to enable you to use SelectType mode. In this mode you can access menus that allow you to change printer settings such as the resolution, the number of copies, and the printer's communication and protocol settings. For a full list of the printer settings available through SelectType and for information about changing settings using SelectType, see Chapter 4.

Note:

You will not normally need to use SelectType. Most software programs allow you to change printer settings.

Control panel components

The main components of the control panel are the liquid crystal display (LCD), indicator lights, and buttons.



Display

The display shows the printer's current status, an error message, or the current SelecType menu or item.

Indicator lights

- | | |
|------------------|--|
| On Line | On when the printer is on line, indicating that the printer can receive and print data. The light flashes as the printer switches between on-line and off-line status. |
| Continue | Flashes when an error is detected or a maintenance procedure is needed. The error or maintenance message appears on the display at the same time. To correct the problem described on the display, see Chapter 6, "Troubleshooting and Maintenance." |
| Form Feed | On when data is received and stored in the printer's buffer but not yet printed. Rapid flashing indicates the printer is receiving data from the computer. |

Buttons

The buttons on the control panel allow you to access printer functions. Most buttons have two functions, one listed on top of the button and the other below the button. The top function is accessible by simply pressing the button. The bottom function is accessible by pressing the button while you are holding down the **Alt** button.

The buttons on the control panel function as follows:

**On Line/
Manual**

Switches the printer between on-line and off-line status. This switch is disabled when the printer is in SelecType mode.

Pressing this button while holding down the **Alt** button turns on manual feed so you can feed single sheets of special stock such as envelopes, transparencies, and labels. See Chapter 2, "Paper Handling," for more information about manual feed.

When manual feed is on, pressing this button prints the next sheet.

**Menu/
Tray Select**

The first time you press **Menu**, the printer goes off line, and SelecType mode is turned on. Each time you press **Menu**, you advance to the next SelecType menu.

When the printer is on line, pressing this button while holding down the **Alt** button allows you to quickly change the selected tray. For more information, see "Using the control panel buttons" in Chapter 2.

Item/ Paper Size	<p>In SelectType mode, advances through the list of items available for the currently selected menu. An asterisk indicates the current setting.</p> <p>When the printer is on line, pressing this button while holding down the Alt button allows you to quickly change the selected paper size. For more information, see “Using the control panel buttons” in Chapter 2.</p>
↑ (arrow>	Advances through the settings that are available for the current SelectType item.
Alt	Modifies the function of other buttons.
Enter/ Form Feed	<p>In SelectType mode, accepts the setting currently shown on the display as the new value.</p> <p>When the printer is on line and data is remaining, pressing this button while holding down the Alt button prints out the data and clears the buffer.</p>
Continue/ Reset	<p>Enables the printer to resume printing after certain error or maintenance-required conditions.</p> <p>Pressing this button while holding down the Alt button resets the printer with new SelectType settings.</p>

Other common uses for these buttons are as follows:

- ❑ **On Line** Press to set the printer on line after you reload paper. (The printer is off line when the paper is out.)
- ❑ **Reset** Press to stop printing or to clear remaining data.
- ❑ **Form Feed** Press to print out data in the printer's memory. (This button ejects the page even though the printer has not received a form feed command.)

Changing the language of display messages

By default, the display messages are in English as are the status sheet and font sample printouts; however, you can change the language to any one of the following: French, German, Italian, Spanish, Swedish, Danish, Norwegian, Dutch, Finnish, or Portuguese.

To change the language of display messages:

1. Turn off the printer.
2. **While holding down the Menu button, turn on the printer.**
Do not release the Menu button until the display shows CONFIG LANGUAGE.
3. Press the arrow button to select the language you want to use.
4. Once the language you want to use is displayed, press the **Enter** button to save the new setting.
5. Hold down the **Alt** button and press **Reset** to update the printer for the new language.

Controlling the Printer with Software

Most software programs have a Printer Setup menu that allows you to adjust certain printer settings such as the number of copies, orientation, and resolution. The settings you can change depend on your particular software and the driver you are using. See your software manual for specific information about the Printer Setup menu.

If you are using Windows, you can control printer settings through the **Printers** icon in the Windows Control Panel. Double-clicking on the **Printers** icon brings up a dialog box that allows you to do the following:

- Install a new printer driver.
- Change the type of printer interface port.
- Modify certain printer settings.

See your Windows manual for specific information about printer setup options.

Sharing the printer

Up to four computers can be connected directly to the printer if you install optional interfaces and if each computer is connected to a different interface port. If you need to connect more than four computers or if you need to connect multiple computers to the same port, you can indirectly connect the computers to the printer by using a switch box.

When multiple users are connected to the printer, you need to be aware of the potential configuration and emulation conflicts that can occur when different users have different print requirements. The following potential conflicts can occur:

- ❑ Users might be using different SelecType settings.
- ❑ Users might be using different drivers and thus require different emulations.

The conflicts occur because SelecType settings are shared by all users of the printer, and the emulation is shared by all users of the same interface port. Each time the SelecType settings or the emulation is changed, other users are affected.

Sharing printer settings

If you modify printer settings from your software, the changes affect only your print job. Except for resolution and page protect, changes made from your software application will not affect other users.

However, the SelecType printer settings are shared among all users of the printer. The only SelecType settings that are not shared among all ports are the EMULATION, PARALLEL, and SERIAL menu settings.

If you change settings using SelecType, you also change settings for all other users, so it's important to keep other users informed of the changes you make. Also, if your printout is not what you expect, check first whether any SelecType settings have been changed by another user.

Sharing emulations

Each interface port has an emulation assignment that is made through SelecType. By default, the ports are configured for LJ4 emulation. However, you or other users might need to change the emulation depending on your needs or the driver you are using. See Chapter 5, "Using Other Printer Emulations," for more information about emulations.

Each time the emulation is changed, the printer reconfigures its memory, erasing all printer settings stored in memory, including downloaded fonts. Thus it is important to first warn other users whenever you plan on changing the emulation.

Note:

when one user changes an emulation while the printer is in the process of printing a job that has already been received, the printer will not change the emulation until after the current job has finished printing.

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Standard and Optional/Paper Trays

The printer's standard paper tray holds up to 150 sheets of various standard-size papers, including letter, legal, A4, and executive. For other sizes and exact specifications, see Appendix A.

In addition, you can print on special stock such as heavy paper, envelopes, labels, or transparencies. To do so, you need to manually feed single sheets one at a time. See the section "Printing on Special Paper" later in this chapter.

Two optional paper trays are available. An optional lower paper cassette holds up to 250 letter-size sheets, increasing the printer's paper capacity so that up to 400 sheets can be printed without having to reload. An optional faceup output tray can be installed to receive pages that have been printed face up. For more information about the optional paper cassette and faceup output tray, see Appendix C.

Choosing Paper

For best results, use paper made especially for laser printers or plain-paper copiers. Paper should be of good quality and relatively smooth with a weight between 60 and 90 g/m² (16 and 24 lb). Because the printer is sensitive to moisture, always store paper in a dry place.

You may use colored paper but not paper to which a clear or colored coating has been added. When using preprinted paper stock such as letterheads, use papers and inks designed for laser printers. Ordinary inks or dyes may smear or come off when subjected to the high temperature of the fuser. Always test samples of paper stock before purchasing large amounts.

Note:

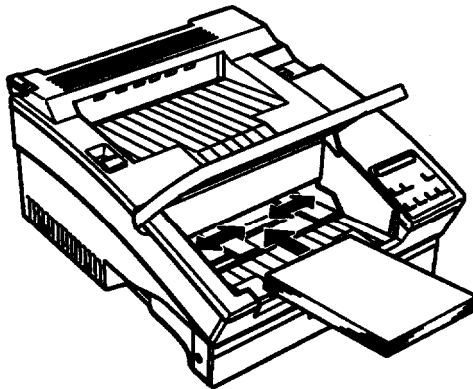
The quality of any particular brand or type of paper may be changed by the manufacturer at any time, so Epson cannot guarantee any particular one.

To print on heavy paper (greater than 90 g/m² or 24 lb) or to print envelopes, labels, and transparencies, see "Printing on Special Paper" later in this chapter.

loading Paper

When the printer is out of paper, it goes off line so you can reload paper in the tray.

To load a stack of paper in the printer's paper tray, fan the paper, open the paper cover, adjust the paper guides for the proper width, and insert the paper into the tray. Then close the cover.



Once you have loaded paper, put the printer back on line by pressing the **On Line** button.

For information about loading heavy paper, envelopes, labels, or transparencies, see 'Printing on Special Paper' later in this chapter. For information about loading paper in the optional lower cassette, see Appendix C.

Setting the paper tray's paper size

By default, the printer is set up to expect letter-size paper to be loaded in both the standard tray and optional lower paper cassette. If you load paper of a different size, you need to use the control panel to update the printer for the paper size loaded in the tray. This cannot be done from your software.

1. Hold down the **Alt** button while you press the **Paper Size** button. This displays the standard tray's current setting.

STD SIZE = LTR

To display the lower paper cassette's paper size, press the **Item** button.

2. Press the arrow button to change the paper size. Keep pressing until the correct paper size is displayed.

STD SIZE = LGL

3. Press the **Enter** button. This saves the displayed value as the new paper size. An asterisk (*) at the right of the display that indicates the setting shown is selected.
4. Press the **On line** button to put the printer back on line.

If you see the message **RESET TO SAVE**, the new setting cannot take place immediately. Press the **Reset** button while you hold down the **Alt** button. This updates the printer with the new setting.

Selecting the Paper Source

If you have installed the optional lower paper cassette, the printer has two sources from which to print. Most software applications have a Printer Setup menu which specifies the paper source. The setup menu usually has an Auto Select option that selects the tray based on paper availability and the size of paper loaded in the tray. If paper is available in both trays and is the same size, the printer's standard tray is used. However, you can also explicitly specify the tray from which you want to print.

If you are using Windows, you can select the paper source using the **Printers** icon in the Windows Control Panel so the paper source setting applies to all your Windows software. The procedure to do so is discussed in the next section.

If for some reason you cannot choose the paper source from your software, you can use the SelectType setting STD TRAY or OPT TRAY in the TRAY SIZE MENU. For more information, refer to Chapter 4.

Using Windows software

1. In the **Main** window, double-click on the **Control Panel** icon.
2. Double-click on the **Printers** icon.
3. Choose the **Setup** button.
4. In the dialog box that appears, select the appropriate paper source.

If you are using the HP LaserJet 4 driver, the dialog box gives you several paper source options. These options translate to the following paper sources available on your printer.

Option in menu	Paper source on finter
Auto Select	Auto select. The software decides which tray to select based on paper size and availability.
MP or Multipurpose Tray	Lower paper cassette (option)
Paper Cassette	Standard paper tray
Manual Feed	Manual mode for standard paper tray. Use manual feed for heavy paper, envelopes, transparencies, and other special papers.
Lower Cassette (option)	Lower paper cassette (option)
Envelope Feeder	Not available (page will be ejected). Use manual feed for printing envelopes.

5. Choose the OK button.
6. Close the Printers dialog box.

Using DOS software

Since each MS-dos[®] program differs in its setup capabilities, there is no standard way to select the paper source. See your software documentation for information.

Printing on Special Paper

The printer's manual feed feature allows you to print on special paper stock such as heavy (over 90 g/m² or 24 lb) paper, envelopes, labels, and transparencies. When selecting special types of paper or other stock, follow the recommendations given in the next section.

When printing on special paper, you might prefer to print face up. To do so, set the paper path selector on the top left corner of the printer to the faceup position. If you print on special paper regularly, you might want to install the optional faceup output tray. See Appendix C, "Option Installation."

Choosing special paper

below are some recommendations for selecting paper and other print media for the printer.

Envelopes

Load envelopes with the flap-side down. The printing quality on envelopes may be irregular because different parts of an envelope have different thicknesses. Print one or two envelopes to check the print quality. If the printing is too light, adjust the print density as described in Chapter 6. Using the optional face-up output tray will keep envelopes from curling.

Do not use window envelopes unless they are specially designed for laser printers. The plastic on most window envelopes can melt when it comes in contact with the hot fuser.

Labels

Use only labels designed for laser printers or plain-paper copiers. When printing labels, print in the face-up position; this keeps the labels from curling or coming off the backing sheet.

To prevent the adhesive from coming into contact with printer parts, always use labels that completely cover the backing sheet, with no gaps between the individual labels.

You should test the label sheet for leaking adhesive by pressing a sheet of paper on top of a sheet of labels. If the paper sticks, do not use the labels.

Transparencies

You can use overhead projector transparencies and adhesive drafting film if they are made for use with laser printers or plain-paper copiers. When printing on these materials, print in the faceup position.

Using manual feed

1. Select the paper size and select manual feed as the paper source.

If possible, use your software to select the paper source and enter manual feed. Then skip to step 7.

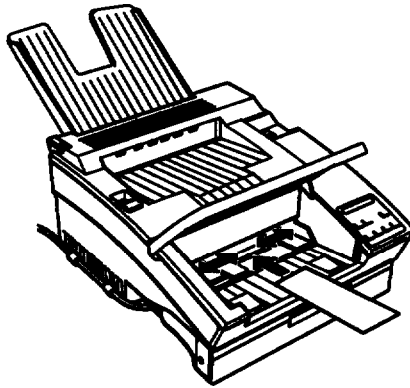
If you are not able to select the paper source and manual feed through your software, use the control panel buttons as described in steps 2 through 6.

2. Use the printer's control panel to select the page size as described in "Setting the paper tray's paper size" earlier in this chapter.
3. To use the control panel buttons to select manual feed, first hold down the **Alt** button and press the **Manual** button. The display shows the following: **MANUAL FEED=OFF**.
4. Press the arrow button once so the display now shows **MANUAL FEED = ON**.
5. Press the **Enter** button. An asterisk (*) indicates that the setting shown is selected.
6. Press the **On Line** button to put the printer back on line.

Note:

*If the **RESET TO SAVE** message appears, press the **Reset** button while you hold down the **Alt** button.*

7. Open the paper cover and remove the paper currently loaded.
8. Adjust the paper guides to match the width of the paper you are using and insert a single sheet of paper into the paper tray as far as it will go.



If you are printing envelopes, you can load up to ten envelopes into the standard tray; the exact number depends on the thickness of the envelopes.

9. When the printer receives one page of data, the message **MANUAL FEED** appears on the display followed by the selected paper size.
10. Press the **Manual** button to print the sheet.

The printer stops after printing the single sheet. If you want to print additional pages, load another sheet and press the **Manual** button. Repeat the above procedure for each sheet you need to load manually.

Once you are finished manually printing sheets, replace the paper in the paper tray and close the cover. To take the printer out of manual feed, either use your software or the control panel, depending on how you initially selected manual feed.

Chapter 3

Fonts

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What You Need to Know about Fonts

This chapter provides basic information about fonts. If you are new to fonts and desktop publishing, you might want to read this chapter to understand fonts and the terminology used to describe them.

However, an understanding of fonts is not necessary to use fonts. To select a font, you simply make a selection from your software's Font menu. The font is then displayed on screen and can be printed by using a software menu item.

The only time you might need to understand more about fonts is if you are encountering font problems. The most common font problems are the following:

- ❑ The printer substitutes a font other than the one you selected with your software.
- ❑ The printed page does not exactly match what is on screen.

Such problems normally occur when you use an emulation other than LJ4 or when you are trying to print fonts that are not installed on the printer. If you are having font problems, read the section "Printer and Screen Fonts" in this chapter to understand how you can resolve and avoid font problems.

Font Overview

A font, or **typeface**, is a set of characters and symbols that share a common typographic design and style. Popular fonts include Times Roman, Times Roman Bold, Courier, and Arial.

The characters within a font come in a range of sizes, but they share the same style. A style is a slight variation of a particular font design, such as **bold** or *italic*, used for emphasizing words or phrases within a paragraph. Fonts with differing styles, such

as Times Roman and Times Bold, are similar enough in design that you can mix them easily while retaining the same basic font design throughout your document.

The entire set of all styles sharing a font design makes up the font family. When you select a font using your software's Font menu, you are actually selecting the font family. A font family normally contains four fonts: Roman (or Medium), Italic, Bold, and Bold Italic. Some font families, however, contain other styles such as oblique (similar to italic) and demi and book, which have slightly different line weights from Roman.

Note:

*Although this manual uses the term font as described here, other sources attach a **different** meaning to **this** term. Font **is** sometimes used to **refer** to a set **of** characters **with** the same style and same size; other times, it **encompasses** the entire set of characters **of every** size and style **of a** certain typographical design.*

Although fonts come in hundreds of designs, all fonts can be classified either as serif or sans serif. Serifs are the short decorative strokes that come off the main lines of a character, such as the curl at the bottom of the letter n. Serif fonts are commonly used for text. The text you are reading is Palatino, a serif font.



serif



sans serif

Sans serif fonts, such as Arial, have no serifs and are often used for titles and heads (as in this manual) and within tables and diagrams.

Choosing a Font

Although there are not many rules for choosing fonts, the following guidelines will help you in creating attractive documents that are easy to read:

- ❑ Avoid using too many point sizes on one page. As a general rule, use no more than three or four different point sizes on one page.
- ❑ Avoid using too many fonts. Having too many different fonts on the page distracts the reader's attention from the meaning of the words.
- ❑ Avoid using fonts that have designs similar to one another. Generally a serif font is used for text and a sans serif font is used for headings.

Printer and Screen Fonts

Fonts are installed on both the printer and the computer. The printer fonts, which reside in printer memory or on a cartridge, are used by the printer to print text. Screen fonts, which are stored on your computer's media, are used to display text on screen to represent the fonts that will print. In most cases, each printer font has a matching screen font, which ensures that the screen display and the final printed output look exactly the same.

Two separate sets of fonts are needed because the monitor and printer have different requirements for producing fonts (for more information, see "Bitmap and outline fonts" later in this chapter).

Note:

The distinction between printer and screen fonts is not as important when you are using TrueType fonts, which are included with Windows 3.1. See TrueType fonts later in this chapter.

Each font installed on your printer has a matching screen font that is accessible when you are using the LJ4 driver. The screen fonts are installed when you install the printer driver.

When the printer and screen fonts don't match

In some cases, you may have a printer font that does not have a matching screen font, or you may have a screen font but not a corresponding printer font. Such situations occur for the following reasons:

- You install a font cartridge that contains printer fonts but no screen fonts.
- You install a screen font on the computer without installing a printer font.
- You use a driver other than the LJ4 driver.
- You move the screen fonts to a different directory and your computer cannot find them.

If you have a printer font but not a matching screen font, the computer uses an available screen font to display text on the screen. In this case, the screen display will not exactly match the printed output.

If you have a screen font but not a printer font, you will be able to select the font and view it on screen. However, when you send the job to the printer, the printer will not be able to print the font and will substitute another font (Courier).

Bitmap and outline fonts

Fonts that are installed on the printer or computer are classified in two groups according to the method used to create them: bitmap fonts and outline (or scalable) fonts.

- ❑ A bitmap font consists of a dot-by-dot representation of a character or image. Bitmap fonts tell the printer or monitor which dots or pixels to turn on and off to create a character. Since a bitmap is a fixed pattern of pixels, a separate bitmap font is needed for each point size. For example, 10-point Times and 12-point Times require separate bitmap fonts. If your computer does not have the correct bitmap size installed, the system will substitute another font. The result is often a jagged looking character.
- ❑ An outline font is created from a mathematical formula that describes the outline of each character. When the printer needs a certain size of an outline font, it uses the formula to render the character in the requested size, filling in the outline. Only one outline is needed for each font since the outline formula contains all the necessary information for rendering at any size. Thus outline fonts always look smooth and well-shaped, no matter the size.



bitmap font



outline font

Outline fonts are preferred for the printer because the printer must be able to print any point size requested from the software while maintaining high-quality output. Since many software programs allow you to select anywhere from 4-point to 999-point fonts, it would be impractical to store all possible bitmaps at the printer.

Screen fonts, however, are normally bitmap fonts that are designed specifically for screen's resolution. Not all sizes of bitmap fonts are stored at the computer, but the poor quality that results from substituting bitmaps is less of a problem on the screen than it would be at the printer. Also, many users now rely on software programs, such as Adobe's ATM, to redraw screen fonts to the requested size.

TrueType fonts

If you are running Windows 3.1, you can also use TrueType fonts. TrueType is an outline font format that allows the computer to create screen fonts. TrueType fonts were developed jointly by Microsoft Corporation and Apple Computer for use in the Windows 3.1 and Macintosh System 7 environments.

With TrueType fonts there is no need to install screen fonts. The same outline used to create the font to be printed is used to create the font displayed on screen, thus ensuring that the screen display always matches the printed output and eliminating the need to maintain multiple screen fonts.

Available Fonts

The following table lists the fonts that are installed on your printer. The names of all the font families appear on your software's Font menu if you are using the LJ4 driver. If you are using a different driver, not all font families will be available.

The fonts provided with the printer are shown in the following table. For samples of each font family, see “Font Samples” at the end of this chapter.

Font family	Fonts	HP equivalent
Flare Serif 82 S	Medium, Extra Bold	Albertus
Incised 901 SWC	Medium, Bold, Italic	Antique Olive
Swiss 721 SWM	Medium, Bold, Italic, Bold Italic	Arial *
Zapf Humanist 601 Demi SWC	Medium, Bold, Italic, Bold Italic	CG Omega
Dutch 801 SWC	Medium, Bold, Italic, Bold Italic	CG Time®
Clarendon Condensed SWC	Condensed	Clarendon
Ribbon 131 SWC		Coronet
Courier SWC	Medium, Bold, Italic, Bold Italic	Courier *
Original Garamond SWC	Antiqua, Halbfett, Kursiv, Kursiv Halbfett	Garamond
Letter Gothic SWC	Medium, Bold, Italic	Letter Gothic
Audrey Two SWC		Marigold
Symbol Set SWA		Symbol *
Dutch 801 SWM	Medium, Bold, Italic, Bold Italic	Times New *
Swiss 742 SWC	Medium, Bold, Italic, Bold Italic, Medium Condensed, Bold Condensed, Medium Condensed Italic, Bold Condensed Italic	Univers®
More Wingbats SWM		Wingdings *
Line Printer (bitmap)		Line printer
Prestige (bitmap) **	12 cpi, 20 cpi	Prestige

* TrueType font

** Available only in ESC/P2 and FX emulations.

When selecting fonts in your software program, choose the font name listed in the HP equivalent column.

Adding More Fonts

You can install additional fonts by doing one or both of the following:

- Installing a font cartridge in the printer.
- Installing fonts in your computer.

Font cartridges are easy to install and the printer can print them quickly. However, not all font cartridges are compatible with the printer, and you can't mix fonts that are on different cartridges.

Fonts that reside on your computer's hard disk can be transferred, or downloaded, to the printer so they can be printed. Downloaded fonts, also called soft fonts, remain in the printer memory until you turn off the printer or otherwise **re-initialize** it.

With soft fonts you can install any combination of fonts you want and as many fonts as your computer memory supports. However, downloading fonts adds to the time it takes to print, which can be a problem if multiple users are sharing the printer. Also, if you plan on downloading many fonts, you must make sure your printer has sufficient memory.

Installing a font *cartridge*

You install font cartridges in the slot located at the front of the printer.

**Caution:**

Do not touch the connectors on the cartridge or in the printer's cartridge slot; you could damage them.

1. Make sure the printer is off or off line with the **Form Feed** light off.
2. Hold the cartridge face up.
3. Insert the cartridge into the slot and press firmly until it snaps into place.
4. Turn on the printer or set it on line. If **READY** appears, you can use the font cartridge.

**Caution:**

A cartridge error occurred if you see one of the following messages: REMOVE CART, ILLEGAL CART.

If the message **REMOVE CART** appears on the display, you inserted the cartridge when the printer was on line or the **Form Feed** light was on. If you see this message, remove the cartridge and press **Continue**; then repeat steps 1 through 4. If you see the message **ILLEGAL CART**, the cartridge you installed is not compatible with the printer.

Once the cartridge is installed, select the cartridge font with your software. If you are using Windows, follow the procedure below. For non-Windows software, see your software manual.

1. In the **Main** window, double-click on the **Control Panel** icon.
2. Double-click on the **Printers** icon.
3. In the **Printers** dialog box that appears, choose the **Setup** button.

4. In the dialog box that appears, select the cartridge you installed.
5. Choose the OK button.
6. Close the Printers dialog box.

Removing the font cartridge

Follow these steps to remove a font cartridge:



Caution:

Never remove a font cartridge when the printer is on line, in *SelecType* mode, or resetting itself: If you do, a **REINSERT CART** or **REMOVE CART** message appears on the display. You will also see one of these messages if you remove a cartridge while the **Form Feed** light is on (even if the printer is off line).

1. Turn off the printer or take it off line. If the **Form Feed** light is on, press the **Form-feed** button to print out any data before you remove the cartridge.
2. Remove the cartridge by grasping firmly and slowly pulling it straight out of the slot.

Downloading soft fonts

Most font packages make it easy to install fonts by providing their own installer. Normally the installer gives you the option of having the fonts automatically downloaded whenever you start your computer or having fonts downloaded only when you need to print a particular font.

If you're running Windows, you can also install soft fonts by clicking on the **Fonts** icon in the Control Panel to bring up the **Fonts** dialog box. Once **installed**, the fonts are available in all your Windows applications.

Note:

The ActionLaser 1600 can print fonts generated by Bitstream® FaceLift® and Bitstream Fontware installation Kits using Bitstream Fontware Typeface Packages for the PC, See your FaceLift or Fontware User Guide for instructions on using Bitstream fonts with HP LaserJet compatible printers.

Selecting Fonts

You almost always select fonts from the Font menu of your software application. If you are unsure how to do this, check the manual that comes with your software.

If you are sending unformatted text to the printer directly from MS-DOS or if you are using a simple software package that does not include font selection, you can select fonts by using **SelecType**. For information on how to do this, see Chapter 4.

Note:

*Selecting font using **SelecType** is not recommended. Selecting fonts from your software program is easier, and any font selection you make from your software overrides the selection you make from **SelecType**.*

Font Samples

Audrey Two SWC

Clarendon Condensed SWC

Courier SWC

Dutch 801 SWC

Dutch 801 SWM

Flare Serif 821 SWC

Incised 901 SWC

Letter Gothic SWC

Line Printer

More Wingbats SWM

Original Garamond SWC

Ribbon 131 SWC

Swiss 721 SWM

Swiss 742 SWC, Swiss 742 SWC Condensed

Symbol Set SWA

Zapf Humanist 601 Demi SWC

Chapter 4

SelecType

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SelectType Overview

If you are not able to change printer settings from your software, use the printer's SelectType mode as described in this chapter. SelectType allows you to use the control panel buttons to change printer settings, such as the print quantity, paper size, and resolution. Other settings control the printer's configuration, including the protocol and communications parameters. For a complete list of printer settings that are accessed through SelectType, see the table later in this chapter.

When to use SelectType

You do not normally need to use SelectType to change printer settings. Most software programs allow you to change settings that affect the final printed output, and any settings you make from your software override the SelectType settings.

Some SelectType settings, including the printer's configuration parameters, cannot be controlled by software. However, such settings do not normally have to be changed because they are assigned default settings that are satisfactory for most computer environments.

Normally the only times you need to use SelectType are the following:

- To check the amount of toner remaining
- To print a status sheet
- To change the parallel or serial interface parameters
- To change the emulation

SelectType menus and items

The following table lists the items available on the SelectType menus. Each menu is described in its own section later in this chapter.

Note:

This table does *not* list the **menus for the ESC/P 2, FX, and GL/2 emulations**. For SelectType **settings for these emulations**, see Chapter 5, *Using Other Printer Emulations*.

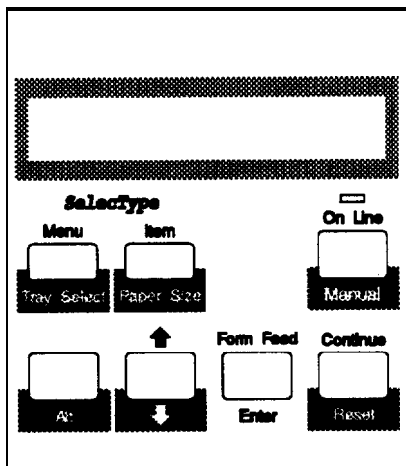
Menu	Items
PRINTING	COPIES PAGE SIZE ORIENTATION MANUAL FEED RTech
LJ4	FONT SRC FONT NUMBER PITCH HEIGHT SYMSET FORM
JOB	PAGE PROTECT RESOLUTION TIMEOUT
EMULATION	PARALLEL SERIAL L/T AUX*
TRAY SIZE	STD SIZE OPT SIZE*

Menu	Items
CONFIG	STD TRAY* OPT TRAY SIZE IGNORE AUTOCONT STANDBY DENSITY AUTO SENSE TOP OFFSET LEFT OFFSET TONER TONER LIFE PAGE COUNT SelectTYPE INIT
PARALLEL	SPEED BI-D
SERIAL	SERIAL TYPE WORD LENGTH BAUDRATE PARITY STOP BIT DTR XON/XOFF DSR
TEST	STATUS SHEET LJ4 FONT SAMPLE ESCP2 FONTSAMPLE FX FONT SAMPLE FACTSHEET RTech TEST PAGE

* Available only with option.

Using SelectType

The SelectType settings are organized as items on a series of menus that are accessed by **using the Menu, item, and arrow** buttons on the printer's control panel.



The buttons have the following functions:

- Menu** The first time you **select Menu**, the printer goes off line, and SelectType mode is enabled. The first menu in the series (**PRINTING**) is then displayed. Each time you press **Menu**, you advance to the next menu.

- Item** Advances through the list of items available for the currently selected menu.

- ↑ (arrow)** Advances through the settings available for the current item. The currently selected setting is shown with an asterisk.

To move through the menus, items, and settings in the reverse order, hold down the **Alt** button and press the **Menu**, **Item**, or arrow button.

Changing and saving SelecType settings

To change a SelecType setting, first use the **Menu** button to advance to the appropriate menu, and then use the **Item** button to select the item you want to change. With the item selected, use the arrow button to change settings.

To save a new **setting**, press the **Enter** button. Then press the **On line** button to put the printer back on line. This saves the setting and updates the printer for the new setting.

If you see the message **RESET TO SAVE**, the new setting cannot be used immediately. Press the **Reset** button while you hold down the **Alt** button until the display shows the message **RESET**. The printer is then updated with the new setting.

Any SelecType settings you change remain in effect until you again change them or until you reset all SelecType settings to the factory defaults as described in the next section.

Resetting SelecType settings to the factory defaults

All SelecType settings have default settings that have been set at the factory. When you change the printer settings by using SelecType, you are overriding the factory-set defaults.

If, after you have changed SelecType settings, you wish to reset all SelecType settings back to the factory defaults, press the **Menu** button until **CONFIG MENU** is displayed in the control panel. Then press the **Item** button until **SelecType INIT** is displayed. Now press **Enter**. This resets the printer to the factory defaults and erases all user-defined settings.

SelecType tutorial

This tutorial provides an example of how to use SelecType to change the baud rate for the serial interface.

1. **Press the Menu button.** This takes the printer off line and displays the PRINTING MENU, which is the first menu of the series.
2. **Press the Menu button** until SERIAL MENU appears in the display.
3. **Press the Item button** until BAUD BATE item appears in the display.
4. The display shows the current setting:

BAUD RATE= 9600 *

The asterisk indicates that 9600 is the current setting.

5. **To change the baud rate to 19200,** press the arrow button until the display reads BAUD RATE=19200.
6. **Press the Enter button** to add the value to printer memory.
7. **Press the On Line button** to put the printer back on line.

If you see the message BESET TO SAVE, press the **Reset** button while you hold down the Alt button.

PRINTING MENU

The PRINTING MENU contains print settings that you change most often, including the number of copies, the page size, the orientation, manual feed, and RITech settings. Normally these items are set from software, so you usually do not need to access the PRINTING MENU.

COPIES

The COPIES item selects the number of copies to be printed. Normally you set the number of copies from your software.

Pressing the arrow button once increases the number in increments of 1. If you press and hold the arrow button, you increase the number in increments of 10.

COPIES=	1 (Default) - 999
----------------	--------------------------

PAGE SIZE

The PAGE SIZE item selects the default paper size. You should only change this item if you cannot change the paper size with your software.

PAGE SIZE=	LT (Default)
	A4
	AS
	B5
	HLT (Half letter)
	LGL (Legal)
	GLT (Government letter)
	GLG (Government legal)
	EXE (Executive)
	F4
	MON (Monarch)
	C10 (Commercial 10)
	DL
	C5
	IB5 (International B5)

ORIENTATION

The ORIENTATION item selects whether the page is printed in portrait or landscape orientation. In portrait orientation, the top of the page is parallel to the short edge of the paper. In landscape orientation, the top of the page is parallel to the long edge of the paper. The pages in this manual are printed in portrait orientation.

ORIENTATION=	PORT (Default)
	LAND

MANUAL FEED

When MANUAL FEED is on, the printer waits for the Manual button to be pressed before printing. For more information about manually feeding paper and envelopes, see Chapter 2, "Paper Handling."

MANUAL FEED=	OFF (Default)
	ON

R/Tech

The RITech (Resolution Improvement Technology) item allows you to adjust the RITech setting or to turn it off. See Chapter 6 for more information about RITech. The RITech setting should not normally have to be changed.

RITech=	LIGHT
	MEDIUM (Default)
	DARK
	OFF

LJ4 Emulation Menu

The LJ4 MENU configures settings that are relevant to HP LaserJet 4 emulation, including the font source, font, and symbol set. Usually you do not need to access the LJ4 emulation menu because most menu items are adjustable from your software. The exception is the symbol set selection.

FONT SRC

The FONT SRC item specifies the font source.

FONT SRC=	RESIDENT (Default) CARTRIDGE DOWNLOAD
-----------	---

FONT NUMBER

The FONT NUMBER item selects a font from the selected font source. Each font is associated with a number (the actual number for each font differs from system to system). If you don't know the number of the font you want to use, you can print a sample font sheet showing the fonts and their numbers. See "TEST MENU" later in this chapter for more information.

FONT NUMBER=	0 (Default)-Available
--------------	-----------------------

PITCH

The PITCH item specifies the pitch of fixed-width, scalable fonts (Courier and **LetterGothic**). Pitch refers to the number of characters that can be printed per inch. For example, if you set the pitch to 12 cpi (characters per inch), 12 characters are printed in one inch. Pitch can be specified from 0.44 to 99.99 cpi in increments of 0.01 cpi.

P I T C H =	.44-10.00 (Default)-99.99
-------------	---------------------------

HEIGHT

The HEIGHT item specifies the point size for proportional and scalable fonts. The range of point sizes is 4.00 to 999.75, in increments of 0.25.

HEIGHT=	4.00-12.00 (Default)-999.75
---------	-----------------------------

SYMSET

The SYMSET item specifies the symbol set to use. If the font you selected in FONT SRC and FONT NUMBER is not available in the new SYMSET setting, the FONT SRC and the FONT NUMBER are automatically replaced with the default value. The following table lists the symbol sets available for LJ4 emulation.

SYMSET=	Roman-8* (Default)	Roman Extension
	ECM94-1	Legal
	8859-2 ISO	PsMath
	8859-9 ISO	WITurkish
	MsPublishing	VeMath
	DeskTop	Math-8
	WIE.Europe	PcTk437
	Windows	PsText
	IBM-US	IBM-DN
	McText	PcMultilingual
	VeInternational	VeUS
	PIFont	PcE.Europe
	Symbol	WIAnsi
	Yore Wingdings	

The Roman-8 includes the following: Norweg 1, Italian, Swedsh2, ANSI ASCII, UK, French2, German, and Spanish.

Symbol sets can also be changed using a command language. See Appendix B.

FORM

The FORM item specifies the number of lines for the selected paper size and orientation. This setting also determines the spacing between lines.

FORM=	5-60 (Default)-128
-------	--------------------

ESCP2 MENU

The ESCP2 MENU configures settings that are relevant to ESC/P2 emulation. The items on the ESCP2 MENU can be changed only if you are running ESC/P2 emulation.

For more information about the ESCP2 MENU, see Chapter 5, "Using other Printer Emulations."

FX MENU

The FX MENU configures settings that are relevant to Epson FX emulation. The items on the FX MENU can be changed only if you are using FX emulation.

For more information about the FX MENU, see Chapter 5, "Using other Printer Emulations."

GL2 MENU

The GL2 MENU configures settings that are relevant to Epson GL/2 emulation. The items on the GL2 MENU can be changed only if you are using GL/2 emulation.

For more information about the GL2 MENU, see Chapter 5, "Using Other Printer Emulations."

JOB MENU

The items on the JOB MENU configure how the printer manages print data, including whether to print oversized pages, the print resolution, and how long the printer waits before it takes a timeout. The items on the JOB MENU can be changed through your software if you are using the LJ4 driver.

PAGE PROTECT

The PAGE PROTECT item allows you to allocate additional printer memory. You normally use PAGE PROTECT if you are printing a highly complex page and do not have sufficient memory. To ensure sufficient memory, use PAGE PROTECT to select the paper size for your job.

Normally PAGE PROTECT should be OFF.

Note:

Changing the PAGE PROTECT setting reconfigures the printer's memory and erases any downloaded fonts.

PAGE PROTECT= OFF (Default)
LT (Letter)
LG (Legal)
A4

RESOLUTION

The RESOLUTION item switches the printer resolution between 300 dpi and 600 dpi. Both resolutions produce good-looking, crisp text and graphics. At 600 dpi, however, the resolution is exceptionally sharp because the dots that make up the text and graphics are smaller and more numerous than those used in 300-dpi resolution. The higher resolution of 600 dpi also improves the quality of grayscale images. To obtain 600-dpi resolution, you must use a driver that supports 600-dpi resolution.

Normally, you will want to run the printer in 600-dpi mode to take advantage of the higher resolution. However, because 300-dpi uses less memory, you may sometimes want to use the lower resolution if you encounter memory problems.

RESOLUTION=	600 (Default)
	300

TIMEOUT

The TIMEOUT item specifies how long the printer waits for data from the active port before it terminates the print job. If the printer waits the specified number of seconds without receiving data, it switches automatically to another interface port that has data ready to print. The timeout period is counted only while the printer is on line.

TIMEOUT=	5-60 (Default)-300
----------	--------------------

EMULATION MENU

The items on the EMULATION MENU specify which emulation to use for the parallel, serial, L/T (LocalTalk™), and AUX interfaces.

PARALLEL

The PARALLEL item specifies the emulation for print jobs coming over the parallel interface.

PARALLEL=	LJ4 (Default)
	FX
	ESCP2
	GL2

SERIAL

The SERIAL item specifies the emulation for print jobs coming over the serial interface. The default setting depends on your serial interface. Print a status sheet (see "TEST MENU" at the end of this chapter) to see the current setting.

L/T

The L/T item, which is available only if the Epson Talk option is installed, specifies the emulation for print jobs coming over the LocalTalk interface.

The default setting depends on the option you have installed. Print a status sheet (see "TEST MENU" at the end of this chapter) to see the current setting.

AUX

The AUX item, which is available only if an optional interface is installed, specifies the emulation for print jobs coming over the optional interface.

The default setting depends on the option you have installed. Print a status sheet (see "TEST MENU" at the end of this chapter) to see the current setting.

TRAY SIZE MENU

The items on the TRAY SIZE MENU specify the size of the paper loaded in each paper tray. The TRAY SIZE MENU items can be accessed more easily as described in "Setting the paper tray's paper size" in Chapter 2.

STD SIZE

The STD SIZE item sets the paper size for the standard tray.

STD SIZE=	LT (Default)
	A4
	A5
	B5
	HLT (Half letter)
	LGL (Legal)
	GLT (Government letter)
	GLG (Government legal)
	EXE (Executive)
	F4
	MON (Monarch)
	C10 (Commercial 10)
	DL
	C5
	IB5 (International B5)

OPT SIZE

The OPT SIZE item sets the paper size for the optional lower paper cassette.

OPT SIZE=	LT (Default)
	A4

CONFIG MENU

The items on the CONFIG MENU specify information needed by the printer, including which paper source to use, how to handle certain errors, how to use memory, what density setting to use, where to begin printing on the page, and the lifetime setting for the imaging cartridge.

STD TRAY, OPT TRAY

The STD TRAY and OPT TRAY items, which are available only if the optional lower cassette is installed, select the paper source when the selection is not made by software.

If you do not wish one of the trays to be available as a paper source, use LOCK. Only one paper source can be set to LOCK; when you set one paper tray for LOCK, the other source is automatically set to UNLOCK. For more information about selecting the paper tray, see “selecting the Paper Source” in chapter 2.

If both STD TRAY and OPT TRAY are set to UNLOCK (the default), the software selects the tray based on paper availability and size.

STD TRAY or OPT TRAY=	UNLOCK (Default)
	LOCK

Note:

Any settings made from your software override the tray settings made using the control panel.

SIZE IGNORE

When SIZE IGNORE is set to ON, the printer ignores the paper size error (CHECK PAPER SIZE) and prints the page even if the print data exceeds the printable area for the specified page size. If printing exceeds the printable area, toner may smudge on the printed sheet.

When SIZE IGNORE is OFF, the printer stops if the page size exceeds the printable area and does a self-cleaning once it recovers from the error.

SIZE IGNORE=	OFF (Default)
	ON

AUTO CONT

The AUTO CONT item permits the printer to automatically continue printing after waiting five seconds when the PAPER SET, PRINT OVERRUN, or MEM OVERFLOW error occurs.

When AUTO CONT is OFF, you must press the **Continue** button to resume printing. In most cases, leave this option set to OFF so you are aware of the error messages and can make the necessary corrections. You might want to set AUTO CONT to ON when printing long jobs or when you are away from the printer for long periods.

AUTO CONT=	OFF (Default)
	ON

STANDBY

STANDBY mode saves energy by reducing power to the printer when it has received no data for 15 minutes. This feature conforms to United States Environmental Protection Agency guidelines for energy efficiency. The printer begins warming up as soon as you send a print job or press the **On Line** button; warm-up takes approximately 30 seconds.

STANDBY=	ENABLE (Default)
	DISABLE

DENSITY

The DENSITY item adjusts the print density to make it darker or lighter.

DENSITY=	DARK
	DARKEST
	MIDDLE (Default)
	LIGHT
	LIGHTEST

Note:

Increasing the density **increases** the rate of toner consumption.

AUTO SENSE

The AUTO SENSE item specifies whether the printer can receive data through all available interfaces or only through the selected interface. Use AUTO SENSE to restrict use of an interface.

AUTOSENSE=	ON (Default)
	PARALLEL
	SERIAL
	L/T
	AUX

TOP OFFSET

The TOP OFFSET item **specifies** in millimeters how far from the top edge of the *printable area* the printer can begin printing. The options are 0-99, adjustable in 1-mm increments.

TOP OFFSET=	0 (Default)-99
-------------	----------------

LEFT OFFSET

The LEFT OFFSET item specifies in millimeters how far from the left side of the *printable area* the printer can begin printing. The options are 0-99, adjustable in 1-mm increments.

LEFT OFFSET=	0 (Default)-99
--------------	----------------

TONER

The TONER item displays the amount of toner remaining in the imaging cartridge; it does not allow you to make any Selections.

TONER=	E* ****F(80-100%)
	E**** F (60-80%)
	E* ** F (40-60%)
	E** F (20-40%)
	E* F (0-20%)

If the TONER setting is between 0% and 20%, you must change the imaging cartridge.

TONER LIFE

The TONER LIFE item specifies the lifetime in pages of the imaging cartridge. This item is necessary only when you are installing a cartridge whose lifetime is not 6000 pages. You do not need to change this setting when you install the standard imaging cartridge (S051016). The TONER LIFE setting is adjustable in increments of 1000 pages.

TONER LIFE=	5000-6000 (Default)-9000
-------------	--------------------------

PAGE COUNT

When PAGE COUNT is selected, pressing the Enter button displays the total number of pages printed by the printer since it was installed.

SelecType INIT

When **SelecType** INIT is selected, pressing the Enter button re-initializes the printer, which erases all user-selected settings and returns the printer to the default factory settings.

PARALLEL MENU

The PARALLEL MENU items allow you to adjust the speed and bidirectional settings for the parallel interface.

SPEED

The SPEED item specifies transfer speed by specifying the delay period from the STROBE to the ACKNLG signal. Normally you do not need to change the SPEED item; however, if your computer uses the ACKNLG signal, you sometimes need to set SPEED to SLOW. For more information on the parallel interface signal, see "Parallel interface" in Appendix A.

SPEED=	FAST (Default)
	SLOW

BI-D

The BI-D item enables or disables bidirectional communication. If BI-D is set to OFF, LJ4 emulation will work as PCL 5 emulation. This means that some advanced features of LJ4 emulation will not be available.

BI-D=	ON (Default)
	OFF

SERIAL MENU

The items on the SERIAL MENU specify the settings for the serial interface, including the type of serial interface (RS-232C or RS-422) and the settings for word length, baud rate, parity, stop bit, XON/XOFF, DTR, and DSR. If you are using the serial interface, these settings must match your computer's serial settings.

SERIAL

The SERIAL item selects between RS-232C and RS-422. This option must match the serial interface of your computer.

SERIAL=	RS-232C (Default)
	RS-422

WORD LENGTH

The WORD LENGTH item specifies the number of bits (excluding the parity bit) defining each character. The printer's word length setting must match the setting used by your computer. See your computer manual and software documentation for the proper setting.

WORD LENGTH=	8 (Default)
	7

BAUD RATE

The BAUD RATE item sets the data transfer rate (baud) for both the **RS-232C** and **RS-422** serial interfaces. The baud rate is measured in bits per second (bps). The printer's baud rate setting must match the baud rate of your computer. See your computer manual and software documentation for the correct setting.

BAUD RATE=	300
	800
	1200
	2400
	4800
	9800 (Default)
	19200
	38400
	57800
	115200

PARITY

The PARITY item specifies whether to use parity checking and the type of parity checking to use. The parity bit, if used, provides a basic form of error detection. The printer's parity setting must match the parity setting of your computer. See your computer manual and software documentation for the proper setting.

PARITY =	NONE (Default)
	EVEN
	ODD

STOP BIT

The STOP BIT item sets the number of stop bits on each character of information sent to the printer. Stop bits signal the end of a character. This setting must match the stop bit setting of your computer.

STOP BITS=	1 (Default)
	2

DTR

The DTR (Data Terminal Ready) item enables and disables the printer's ready communications protocol. Check your computer manual for the setting you should be using. If XON/XOFF is OFF, DTR must be set ON.

DTR=	OFF (Default)
	ON

XON/XOFF

The XON/XOFF item specifies whether the printer uses XON/XOFF communications protocol. Check your computer manual for the setting you should be using. If DTR is OFF, XON/XOFF must be set to ON.

XON/XOFF=	ON (Default)
	OFF

DSR

When the DSR (Data Set Ready) item is OFF, the signal level is permanently set HIGH, allowing the printer to send data to the computer. For most communications purposes, DSR should be set OFF. When DSR is ON, data is sent to the computer only when DSR is HIGH.

Check your computer manual for the setting you should be using.

DSR=	OFF (Default)
	ON

TEST MENU

The items on the TEST MENU allow you to print sample pages to test the printer or obtain information about the fonts and the printer settings and features. To print a sample sheet, select the item in the TEST MENU and then press the Enter button.

STATUS SHEET

Press the Enter button to print a status sheet describing the printer's current settings. Use this item to check whether your printer is working correctly. The following is a portion of a sample sheet. Your status sheet might vary slightly.

Printing Menu

Copies:	1	Manual Feed:	OFF
Page Size:	LT	RITech:	OFF
Orientation:	PORT		

Job Menu

Page Protect:	OFF	Timeout:	60 sec
Resolution:	600		

Emulation Menu

Parallel:	LJ4	L/T:	LJ4
Serial:	LJ4	AUX:	ESCP2

Tray Size Menu

Standard Tray Size:	LT	Option Tray Size:	LT
---------------------	----	-------------------	----

Configuration Menu

Standard Tray:	UNLOCK	Auto Sense:	ON
Option Tray:	UNLOCK	Top Offset:	0 mm
Size Ignore:	OFF	Left Offset:	0 mm
Auto Continue:	OFF	Toner:	E*****P
Standby:	ENABLE	Toner Life:	6000
Density:	MEDIUM		

Parallel Menu

Speed:	FAST	BI-O:	ON
--------	------	-------	----

Serial Menu

Serial Type:	RS232C	Stop Bit:	1
Word Length:	8	DTR:	OFF
Baud Rate:	38400	XON/XOFF:	ON
Parity:	NONE	DGR:	OFF

LJ4 Menu

Form Length:	64 lines	Pitch:	10.00 cpl
Font Source:	RESIDENT	Height:	12.00 pt.
Font Number:	0	Symbol Set:	Roman-8

GL2 Menu

GL mode:	LJ4GL2	Pen0 Width:	0.35 mm
Scale:	OFF	Pen1 Width:	0.35 mm
Origin:	CORNER	Pen2 Width:	0.35 mm
Pen:	0	Pen3 Width:	0.35 mm
Line Ends:	BUTT	Pen4 Width:	0.35 mm
Line Joins:	MITERED	Pen5 Width:	0.35 mm
		Pen6 Width:	0.35 mm

ESCP2 Menu

Font:	Courier	Country:	USA
Pitch:	10 cpl	Auto CR:	ON
Condensed:	ON	Auto LF:	OFF
Top Margin:	0.50 inch	Zero Character:	0
Text Length:	66 lines	Bit Image:	DARK
CG Table:	Ratio		

FX Menu

Font:	Courier	Country:	USA
Pitch:	10 cpl	Auto CR:	ON
Condensed:	ON	Auto LF:	OFF
Top Margin:	0.50 inch	Zero Character:	0
Text Margin:	66 lines	Bit Image:	DARK
CG Table:	Ratio		

LJ4 FONT SAMPLE, ESCP2 FONT SAMPLE, FX FONT SAMPLE

Press the Enter button to print a sample of the fonts available in the current emulation.

FACT SHEET

Press the Enter button to print a demonstration page that illustrates various printer features. FACT SHEET is available only if the control panel language is set to one of the following: English, ITALIANO, Español, SVENSKA, DANSK, SUOMI. For information about changing the language, see Chapter 1.

R/Tech TEST PAGE

Press the Enter button to print a check pattern for the RITech setting. RITech TEST PAGE is available only for 600-dpi resolution. See Chapter 6 for more information.

Chapter 5

Using Other Printer Emulations



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When to Use Other Emulations

The printer is designed to work best using HP LaserJet 4 (LJ4) emulation, so it is recommended that you use LJ4 emulation whenever possible. However there may be some cases when you want to use other emulations, including the following:

- ❑ If you need to print documents already formatted for a dot matrix printer.
- ❑ If you are printing from software designed for an HP-GL/2 plotter.
- ❑ If you need to use software programs that do not support an HP LaserJet printer.

Other Available Emulations

In addition to the LJ4 emulation, the printer has three other resident emulations:

- | | |
|--------------------|---|
| Epson ESC/P 2 (LQ) | ESC/P 2 is an advanced version of the Epson LQ mode available in previous Epson page printers. It emulates Epson LQ-570 24-pin dot matrix printers and features Epson ESC/P 2 control codes. Use this emulation to print data formatted for an Epson LQ series printer. |
| Epson FX | FX mode emulates the Epson FX-870/1170 9-pin dot matrix printer. Use this emulation to print data formatted for Epson FX or LX series printers. |
| Epson GL/2 | GL/2 mode features the HP-GL/2 plotter commands. Use this emulation when printing drawings created with plotter applications. |

Changing the Emulation

Normally you change the emulation using SelecType. Advanced users may send printer commands specific to each emulation directly to the printer. See Appendix B for a list of all available commands.

When changing the LJ4 emulation to another emulation, you might need to change some SelecType settings to account for differences between the ActionLaser 1600 and dot matrix printers or GL/2 plotters. Also, some printer settings are interpreted differently, depending on the emulation. For more specific information about possible changes to printer settings, see "Epson ESC/P 2 and FX Emulations" and "Epson GL/2 Emulation."

Note:

Emulation settings are stored in printer memory. Each time the emulation is changed, the printer must reconfigure its memory for the new emulation. Any other printer data being stored in memory, such as downloaded fonts, will be lost.

To change the emulation using SelecType:

1. Press the **Menu** button until you reach the EMULATION MENU.
2. Press the **Item** button to select the interface port you want to configure.
3. Press the arrow button to select the emulation to be used for the specified interface.
4. Press the **Enter** button to save the emulation.
5. Hold down the **Alt** button and press **Reset** to update the printer with the new settings.

Epson ESC/P 2 and FX Emulations

The ESC/P 2 and FX emulations allow you to use the printer with software that supports only Epson LQ or FX printers without having to modify the software controlling your printer.

Operating as an LQ of Fx printer

Before you can operate the printer as an LQ or FX printer, you need to first select the appropriate driver. For ESC/P 2 emulation, **select one of the following drivers, which are listed below in order of preference. If none of these drivers is available, use any other LQ printer driver.**

LQ-570
LQ-510/550
LQ-500
LQ-860
LQ-850

For FX emulation, select one of the following drivers, which are listed below in order of preference. If none of these drivers is available, use any other FX or LX printer driver.

FX-870/1170
FX-850/1050
FX-800/1000
LX-100
LX-810/850
LX-800

Once you select the driver, you need to change the emulation as described in "Changing the Emulation" earlier in this chapter.

When you print documents formatted for dot matrix printers, you might need to change some printer settings to account for differences between the ActionLaser 1600 and dot matrix

printers. For example, some dot matrix printers allow you to print on oversize sheets that cannot be accommodated by the ActionLaser 1600; if this is the case, be sure to change the PAGE SIZE setting. Check also that ORIENTATION is correct.

Note:

In ESC/P 2 and FX emulations, the COPIES setting functions differently than when you are in LJ4 emulation. Rather than creating one page of data and printing it the requested number of times (as is done in LJ4 emulation), the printer creates as many pages of data as requested, thus increasing the length of time it takes to print multiple copies.

See Chapter 4 for specific information about each SelecType setting. SelecType settings that are specific to the ESC/P 2, FX, and GL/2 emulations are described in this chapter.

ESCP2 and FX Menu items

If you are not able to use your software program to change printer settings when using ESC/P 2 or FX emulation, use the SelecType ESCP2 MENU and FX MENU. See Chapter 4 for details on using SelecType. Normally, however, you should use your software to change printer settings.

Except where otherwise noted, the same items are available for either emulation. Be sure to reset the printer after you have changed any setting; otherwise the new setting will not be valid.

Font

The **Font** item specifies the font to use.

Font=	Courier (Default)
	Prestige
	Orators (ESC/P 2 only)
	RomanT (ESC/P 2 only)
	SansH (ESC/P 2 only)

After selecting the desired font, you can also adjust the character spacing and size of the font with the **Pitch** and **Condensed** items.

Pitch

The **Pitch** item allows you to select a character pitch of 10,12, or 15 characters per inch (cpi), or choose proportional spacing.

Pitch=	10 cpi (Default)
	12 cpi
	15 cpi
	Prop

Condensed

The **Condensed** item changes the character spacing. **Condensed** printing is useful for spreadsheets and other applications where you need to fit a large amount of information on each line. Fifteen cpi cannot be condensed.

Condensed=	OFF (Default)
	ON

T.Margin

The **T.Margin** item specifies the distance from the top of the sheet to the baseline of the first printable line. This is measured in 0.05-inch increments.

T.Margin=	0.40-0.50 (Default) -1.50 (inch)
------------------	---

Text

The **Text** item sets the page length. The unit of measure for this option is 1/6 inch. The default is 62 (line spacing is 6 lines per inch).

Text	1 - 62 LINES (Default) - available
-------------	---

If you change the **ORIENTATION**, **PAGE SIZE**, or **T.MARGIN settings** with **SelecType**, the page length setting automatically returns to the default setting for each paper size.

CGTable

The **CG** (character generator) **Table** item selects the graphics character table or the italics table. The graphics table contains graphic characters for printing lines, comers, and shaded areas; international characters; Greek characters; and mathematical symbols. Selecting the italics table defines the upper half of the character table as italic characters.

CGTable	PcUSA (Default) ITALIC PcMultiling PcPortugues PcCanFrench PcNorway PcTurkish2 PcEastEurop B•BRASCII B•Abicomp
----------------	---

Country

Use the Country item to select one of the fifteen international symbol sets.

Country=	USA (Default)	Japan
	France	Norway
	Germany	Denmark2
	UK	Spain2
	Denmark	LatinAmeric
	Sweden	Korea (ESCP2 only)
	Italy	Legal (ESCP2 only)
	Spain1	

AutoCR

Use the AutoCR (automatic carriage return) item to perform a carriage-return line-feed (CR-LF) operation whenever the print position exceeds the right margin. If AutoCR is OFF, the printer does not print characters beyond the right margin, and it does not perform a linewrap until it receives a CR. Most software programs take care of this function.

AutoCR=	ON (Default)
	OFF

AutoLF

Use the AutoLF (automatic line feed) item to perform an automatic line feed (LF) command with each carriage return. If AutoLF is OFF, the printer does not send an automatic line feed with each carriage return. If your text lines overprint each other, set AutoLF to ON.

AutoLF=	OFF (Default)
	ON

ZeroChar

The ZeroChar item determines whether the printer prints a slashed zero 0) or an unslashed zero (0). This feature is useful for clearly distinguishing between an uppercase letter O and a zero when printing documents such as programming lists.

ZeroChar=	0 (Default)
-----------	-------------

BitImage

With BitImage set to Dark or Light, your printer can correctly emulate the graphics densities set with the printer commands. When you select Dark, the bit image density is high. When you select Light, the bit image density is low.

Bitimage=	Dark (Default)
	Light
	Barcode

The BarCode setting converts bitmaps to bar codes by automatically filling in any vertical gaps between dots. This produces unbroken vertical lines that can be read by a bar code reader.

Note:

This mode reduces the size of the image being printed and may cause some distortion when printing bitmap graphics.

Epson GL/2 Emulation

Epson GL/2 emulation features plotter commands that allow you to use your printer with plotter software programs.

A list of the plotter commands that your printer supports is included later in Appendix B. Unsupported commands are ignored.

Epson GL/2 emulation is similar to the GL/2 mode included in LJ4 emulation. The table below shows the differences between the two emulations.

	Epson GL/2	HP LaserJet 4
PCL mode	Does not exist	Exists as the initial mode
Paper eject	Supports PG. AF commands	Supported in PCL
Reduced printing	SelecType setting	Available in PCL
Switch to PCL (ESC % # A)	Not supported	supported
Reset (ESC E)	Ejects paper and then initializes	Ejects paper, switches to PCL, and then initializes
PJL and EJL	Supported	Supported
Advance Full Page (PG. AF)	Supported	Not supported

Using the SD and AD commands, you can select all the fonts available in I-P LaserJet 4 emulation.

The two Epson GL/2 emulations

Epson GL/2 emulation has two operational emulations: LJ4-GI/2 and GL-like.

LJ4-GL/2 emulation

LJ4-GL/2 emulates GL/2 mode of the HP LJ4 emulation. While in this emulation you can enter GL/2 emulation without sending the ESC %*#*B (Enter GL/2 mode) command. If your software cannot send the ESC %*#*B command, use this emulation.

If your software supports a LaserJet 4 printer, you do not need to use this emulation.

GL-like emulation

GL-like emulates some of the HP-GL plotter commands. It features all of the commands of the LJ4-GL2 mode, plus two additional commands.

The table below shows the differences of the two GL/2 emulations.

	LJ4-GL2	GL-like
Orientation	SelectType setting	Landscape only
Plotter unit	1/1016 inch	1/1021 inch
Picture frame	Same as LaserJet 4 mode	Depends on the hard-clip limit
Default position of P1 and P2	Lower left and upper right corners respectively of picture frame	Inside of picture frame
Undefined commands	First character is ignored	First two characters are ignored
CS, CA commands	Not supported	Partially supported
Results when the DT command without second parameter is sent	Terminator is not plotted	Terminator is plotted
Default pens	2 pens	8 pens

Operating in GL/2 emulation

When changing to GL/2 emulation from LJ4 emulation, check that the SelecType settings are correct for GL/2 emulation. Some settings, such as PAGE SIZE, ORIENTATION, and STD TRAY, might have to be changed, depending on your document. Check also that the printer settings specific to GL/2 emulation, which are located on the GL2 MENU, are set correctly. Plotter-specific settings, such as PEN, JOIN, and END, are described in this chapter.

For all other SelecType settings, see Chapter 4. Be aware, however, that the descriptions in Chapter 4 assume you are in LJ4 emulation. In some cases, the SelecType setting might function differently, depending on the emulation.

Note:

*Portrait orientation is **available** only in LJ4-GL/2 emulation.*

GL2 MENU items

If you are not able to use your software to control parameters such as the number of pens, pen width, and plot origin, you can use the SelecType GL2 MEND.

Be sure to reset the printer after you have changed any setting, otherwise the new setting will not be valid. See Chapter 4 for details on using SelecType.

GLMODE

The GLMODE item selects the LJ4-GL2 or GL-like mode.

GLMODE=	LJ4-GL2 (Default)
	GL-LIKE

SCALE

The SCALE item determines the reduction scale for reduced printing. You can print the data originally created for the paper size of the SCALE setting onto the paper size selected in the PAGE SIZE setting.

SCALE=	OFF (Default)
	A0
	A1
	A2
	A3

ORIGIN

The ORIGIN item sets the origin for the plotter-unit coordinate system. The origin can be set either to the lower left corner (CORNER) or to the center of the hard-clip limit (CENTER).

ORIGIN=	CORNER (Default)
	CENTER

PEN

The PEN item selects the default pen from the seven available pens.

PEN=	0 (Default) - 6
------	-----------------

Pens 2-6 are available only for GL-like mode. If you change the mode from GL-like to LJ4-GL/2, pen 1 is automatically reselected as the default.

END

The END item determines the type of line ending.

END=	BUTT (Default) SQUARE TRIANGULAR ROUND
------	---



BUTT



SQUARE



TRIANGULAR



ROUND

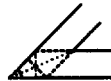
JOIN

The JOIN item defines the join shape.

JOIN=	MITERED (Default) MITEREDBEVELED TRIANGULAR ROUND BEVELED NONE
-------	---



MITERED



MITERED BEVELED



TRIANGULAR



ROUND



BEVELED

PENx

The PENx item specifies the pen width for each pen. You can select the value in the range from 0.05 mm to 5.00 mm in increments of 0.05 mm.

PENx=	.05 - .35 (Default) - 5.00
-------	----------------------------

Chapter 6

Troubleshooting and Maintenance

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Resetting and Initializing the Printer

In many cases, you can eliminate a problem by resetting or **initializing** the printer.

Resetting the printer clears the printer memory without affecting SelecType settings. Normally you reset the printer for a problem related to a single print job.

Initializing the printer clears the memory and also returns all SelecType settings to their factory default settings. Normally you initialize the printer when the printer settings are not what you want.

Resetting the printer

When you reset the printer, you clear the printer's memory. The print job currently loaded in memory is erased and the printer is ready to accept another print job. SelecType settings and downloaded fonts are not affected.

You might want to reset the printer if you suspect the print job itself is bad and the printer cannot print it.

To reset the printer for the currently active interface, hold down the Alt button while you press **Reset**. You can also reset the active interface by turning off the printer for ten seconds, and then turning it back on; however, all downloaded fonts will be erased.

To reset all interfaces, hold down both the **Alt** and **Reset** buttons until the message RESET ALL appears on the display.

Initializing the printer

When you initialize the printer, you clear the printer's memory and you reset all printer settings to the factory defaults. Any downloaded fonts or SelecType settings that were changed from the defaults are lost.

You might want to initialize the printer in the following cases:

- ❑ You have changed the SelecType settings, but you now want to change everything back to the factory settings.
- ❑ Another user has changed printer settings, but you prefer to use the factory settings.

To initialize the printer:

1. Press the **Menu** button until you reach the CONFIG MENU.
2. Press the **Item** button until you reach SelecType INIT.
3. Press the **Enter** button. This resets the SelecType settings back to the factory default settings.
4. Press the **On Line** button. If the RESET TO SAVE message appears, press the **Reset** button while holding down **Alt**.

General Problems

Preventing paper feed and paper jam problems

If you have frequent paper feed or paper jam problems, use this checklist of corrective measures:

- ❑ Use a higher-quality paper that is not too thin or rough. Some types of paper require single-sheet feeding. See Chapter 2, "Paper Handling."

- ❑ Fan the stack of paper and then tap it on the edge to align it before you load it.
- ❑ Be sure that you do not load too much paper in the tray.
- ❑ Be sure to adjust the paper guides so that the paper can slide in and out freely.
- ❑ Never let more than 100 sheets accumulate in the standard facedown output tray on top of the printer.
- ❑ Try turning over the stack of paper in the tray. Most paper packages indicate which side should be face up.

Display panel stays blank when you turn printer on

Turn off the printer and check the power cable connections between the printer and the electrical outlet; then turn the printer back on.

If the electrical outlet is controlled by an outside source such as a wall switch, make sure the switch is turned on or plug another electrical device into the outlet to check whether the outlet is operating properly.

The On Line light is on but nothing prints

Your computer may not be properly connected to the printer. Perform the procedure "Testing the computer-to-printer connection" in the Read *This First* guide.

The interface cable may not be plugged in securely. Check both ends of the cable between the printer and the computer. If you are using a parallel interface, secure the connector using the wire retaining clips.

Make sure that your interface cable meets the specifications for the printer and computer. If you are using a parallel interface, make sure the parallel interface cable is a 6-foot double-shielded, twisted-paired cable.

If you are using the serial interface, be sure you have selected the appropriate interface (RS-232C or RS-422) and that the settings on the SERIAL MENU match the settings of your computer. See your computer manual for the correct settings.

Make sure that your software is properly set up for your printer.

The imaging cartridge may be empty. Use the SelecType TONER setting as described in Chapter 4 to see how much toner is remaining. If toner is low (E F), replace the imaging cartridge as described in the Read This First guide.

Printer doesn't print and the On Line light is off

Press the On Line button once to set the printer on line (the On line light comes on).

Font selected with software commands won't print

If you are using a cartridge font, make sure you have installed the correct font cartridge. Also make sure that the orientation (portrait or landscape) matches the selected font.

Some or all of the output is garbled or printed as asterisks

Make sure that both ends of the interface cable are plugged in securely.

If you are using a parallel interface, make sure the parallel interface cable is a 6-foot double-shielded, twisted-paired cable.

If you are using a serial interface, make sure that both the computer and printer are set to use the same parity, baud rate, number of data bits, and number of stop bits.

If the printer still does not print correctly, contact your dealer or a qualified service person

Position of the printout is not correct

Make sure that you are using the correct page length and margin settings in your software program. Do not use SelecType to make these settings because software settings override SelecType.

Graphics don't print correctly

Make sure that your software program is set for the printer emulation you are using. For example, if you are using the LJ4 emulation, be sure that your graphics software is set for an HP LaserJet 4 printer.

If you are using a serial interface, make sure that you set an 8-bit data word and not a 7-bit word. The data word setting is found on the SelecType SERIAL MENU.

Graphics require large amounts of memory; if you are encountering problems because of insufficient memory, simplify your graphics or use fewer graphics on a page. Also use 300-dpi resolution rather than 600-dpi resolution. If you often print graphics-intensive pages, you may want to add more memory as described in Appendix C.

SelecType does not function as expected

Software programs override SelecType settings. Use software settings instead of SelecType settings whenever possible.

Your settings may have been changed by your software program. Initialize the printer by using the SelecType INIT item in the CONFIG MENU to reset all settings to the factory defaults. See Chapter 4 for more information.

Print Quality Problems

Dark or dirty background

Change the DENSITY option in the SelecType CONFIG MENU to light print.

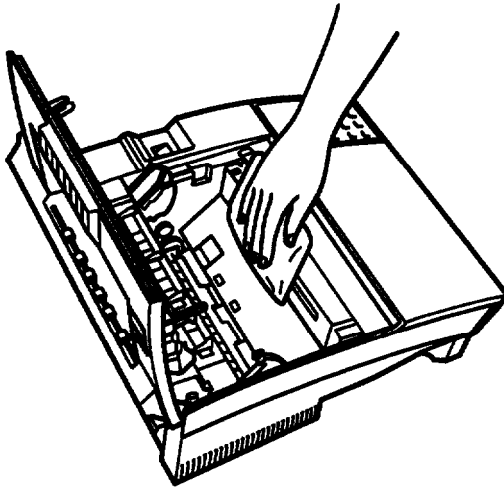
Turn off the printer. Clean the paper path inside the printer using a clean, soft, dry cloth.

Clean internal printer components by printing three pages with only one character per page.

There may be a problem with the imaging cartridge. Remove the cartridge, shake it gently from side to side, and then reinstall it. If this does not solve the problem, replace the imaging cartridge as described in the *Read This First* guide.

Vertical black or white bands or lines

Turn off the printer. Remove the imaging cartridge and place it on a clean, flat surface. Locate and clean the clear lens on the inside middle of the printer.



Wipe the lens from end to end with a clean, soft, dry, lint-free cloth. Then **reinsert** the imaging cartridge in the printer and close the printer cover. If the problem remains, install a new imaging cartridge as **described** in the Read This First guide and print several pages to check the print quality.



Warnings

*Opening the printer exposes the fuser, which is marked **by** a CAUTION HOT SURFACE label. Be **careful** not to touch the **fuser**.*

Horizontal black or white bands or black page

Install a new imaging cartridge as described in the *Read This First* guide.

Uneven darkness

Your paper may be moist or damp. Printing is sensitive to moisture absorbed by the paper. Do not store your paper in a humid or damp environment.

Take out the imaging cartridge, shake it gently from side to side, and then reinstall it.

If this does not solve the problem, install a new imaging cartridge as described in the *Read This First* guide. Then print several pages to check the print quality.

Toner smudges

Remove the imaging cartridge, shake it from side to side to distribute the toner, and wipe the bottom of it with a clean, dry Cloth.

Turn off the printer. Clean the paper path inside the printer using a clean, soft, dry cloth.

Clean internal printer components by printing three pages with only one character per page.

If the problem remains, replace the imaging cartridge as described in the *Read This First* guide.



Warning:

Opening the printer exposes **the fuser**, which is marked by a CAUTION HOT SURFACE label. Be **careful** not to touch the fuser.

Missing areas on printed image

Your paper may be moist or damp. Printing is sensitive to moisture absorbed by the paper. The higher the moisture content in the paper, the lighter the printed output. Do not store your paper in a humid or damp environment.

You may not be using the correct type of paper for your printer. If the surface of your paper is too rough, printed characters appear distorted or broken. Smooth, **high-quality** copier paper is recommended for best results. See Chapter 2 for **information** on choosing paper.

Completely blank pages

Check the SelecType TONER item in the CONFIG MENU. If the TONER message indicates that the amount of toner is low (**E* F**), replace the imaging cartridge as described in the *Read This First* guide.

Check to be sure the imaging cartridge is installed as described in the *Read This First* guide.

The problem may be with your software program or interface cable. Print out a status sheet (see "TEST MENU" Chapter 4). If blank pages continue to print, the problem may be with the printer. Turn off the printer and contact your dealer.

Printed image is light or faint

Use the DENSITY item in the SelecType CONFIG MENU for darker print.

Check the SelecType TONER item in the CONFIG MENU. If the TONER message indicates that the amount of toner is low (**E* F**), replace the imaging cartridge as described in the *Read This First* guide.

Your paper may be moist or damp. Printing is sensitive to moisture absorbed by the paper. The higher the moisture content in the paper, the lighter the printed output. Do not store your paper in a humid or damp environment.

Take out the imaging cartridge, shake it gently from side to side to distribute the toner, and then reinstall it. If the problem persists, replace the imaging cartridge as described in the *Read This First* guide.

Image is too dark

Use the DENSITY item in the SelecType CONFIG MENU for lighter print. If the problem persists, replace the imaging cartridge as described in the *Read This First* guide.

Non-printed side of the page is dirty

Toner may have spilled in the paper feed path. Turn off the printer. Remove the imaging cartridge and then clean the paper path of the printer using a clean, soft, lint-free cloth.



Warning:

Opening the printer exposes **the fuser**, which is marked by a CAUTION HOT SURFACE label. Be **careful** not to touch the **fuser**.

Option Problems

A font cannot be selected or the message REMOVE or ILLEGAL CART appears

Turn off the printer. Then remove and carefully reinsert the cartridge. Turn the printer back on.

Make sure the cartridge is listed in the table of available font cartridges in Appendix C.

Paper does not feed from the optional lower paper cassette

Be sure you have selected the lower paper cassette from your software.

The OPT TRAY setting in the SelecType CONFIG MENU may be set to LOCK. To use the optional lower cassette, the setting must be set to UNLOCK. See Chapter 4 for information on using SelecType to change the OPT TRAY setting.

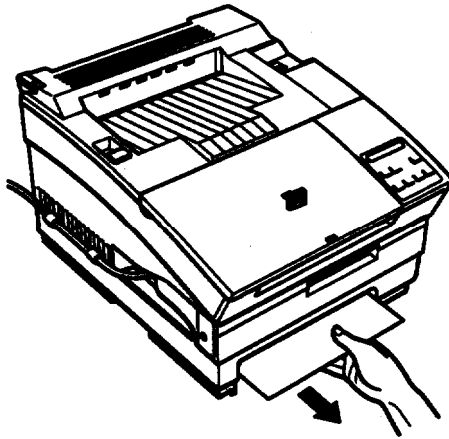
Check that the lower paper cassette has paper loaded. Load paper if necessary.

Be sure that the lower paper cassette is properly installed and that you have not tried to load it with too many sheets of paper. The cassette can hold a maximum of 250 sheets of 75 g/m² (20 lb) paper.

The lower paper cassette may not be installed properly. See Appendix C for instructions on installing the lower paper cassette.

FEED JAM with optional lower paper cassette

1. Remove the lower paper cassette from the lower paper cassette unit.
2. Remove any folded paper from the paper cassette, discarding curled or wrinkled sheets.



3. Tap the edge of the paper stack. Then reinsert it into the cassette, making sure the paper is evenly aligned and rests below the maximum paper mark.
4. Make sure you are using the correct paper size. Your cassette can contain only letter-size paper.

Note:

Make sure you are using paper that meets the specifications for this printer. See Appendix A for the correct paper to use.

5. Press the **Continue** button. The jammed page is automatically reprinted.

Using the optional face-up output tray, the printer does not feed into the face-up tray

Make sure the paper path selector on the top left corner of the printer is set to the faceup position. Never allow more than 20 sheets to accumulate in the face-up output tray.

Status and Error Messages

Status and error messages tell you what the printer is doing and let you know when the printer has encountered a problem.

This section contains an alphabetical list of the status and error messages, giving a brief description of the message and suggestions for correcting the problem.

If the red **Continue** light flashes when an error is detected, correct the problem and then press the **Continue** button to clear the error. If the AUTO CONT item in SelecType is ON, some errors clear automatically even though the problem remains. In most instances, you should leave AUTO CONT set to OFF.

CHECK PAPER SIZE

The paper size specified from the software is different than the paper size specified by the STD SIZE and OPT SIZE settings. Check to see if the correct paper size is loaded in the standard tray or optional lower cassette. You may need to change the STD SIZE and OPT SIZE settings to match the paper size. See "TRAY SIZE MENU" in Chapter 4 for more information.

EEPROM ERROR

The printer found illegal data in the EEPROM memory. Press the **Continue** button to continue. You should also check that any SelectType settings you changed from the factory defaults are still in effect.

FEED JAM

Paper is not feeding into the printer from the specified tray or cassette or has jammed on its way into the printer. Remove the jammed paper and press the **Continue** button. See the *Read This First* guide for detailed instructions.

ILLEGAL CART

The printer cannot read the font cartridge inserted. To correct this error, turn off the printer. Then remove the cartridge as described in Chapter 3 and reinsert it.

IMAGE OPTIMUM

There is insufficient memory to print the page using the specified print quality. The printer automatically reduces the print quality so it can continue printing. If the printout is not acceptable, try simplifying the page by reducing the number of fonts or font sizes or by switching the resolution to 300 dpi. You may also need to increase the amount of printer memory. See Appendix C for more information on adding memory.

INSERT CART

You may have removed an optional font cartridge while the **Form Feed** light was on (indicating print data was received but not yet printed). To correct the error, reinsert the font cartridge and press the **Continue** button.

MANUAL FEED (page size)

Manual feed is specified for the current job. Make sure the specified paper size is loaded in the standard paper tray and press the **On Line** button. For more information about manual feed, see Chapter 2, "Paper Handling."

If you do not want to print using manual mode, press the **Continue** button.

MEM OVERFLOW

The printer has insufficient memory available for the current task. To correct the error, press the **Continue** button. If the message remains, reset the printer as described at the **beginning** of this chapter. You can also clear this message by turning the printer off and back on again.

If you continually receive this message when printing a particular page, try simplifying the page by reducing the number and size of fonts or by using **300-dpi** resolution. You can also add more memory to the printer as described in Appendix C.

PAPER JAM

Paper is jammed in the paper path. Open the printer cover and clear the jammed paper as described in the Read This *First* guide.

PAPER OUT (paper source) (paper size)

There is no paper in the specified tray. Load paper of the specified size and press the **On line** button. See Chapter 2 for instructions on loading paper in the standard paper tray; see Appendix C for instructions on loading paper in the optional lower paper cassette.

PAPER SET (paper source) (paper size)

The paper loaded in the specified tray does not match the required size. Replace the paper in the tray with paper of the specified size and press the **Continue** button. The printer automatically updates the TRAY SIZE setting for the specified paper size.

PC INSTALL

The optional lower paper cassette is not installed but it is specified as the paper source. Turn the printer off, wait ten seconds, and turn the printer back on.

Check the Printers dialog box in your software to be sure that the standard tray is selected.

PRINT OVERRUN

The required time to process the print data exceeds the print engine speed because the current page is too complex. Press **Continue** to resume printing. If this message appears again, change the PAGE PROTECT setting in the JOB menu. See Chapter 4, "SelecType."

PRINTER OPEN

The printer cover is open. Close the printer cover to continue printing.

RAM ERROR 1 or 2

The specified SIMM cannot be used. Remove SIMM 1 (installed in the CN8 slot) or SIMM 2 (installed in the CN9 slot) as appropriate. Reinstall the SIMM as described in Appendix C.

READY

The printer is ready to receive data or to print.

REMOVE CART

You may have inserted an optional font cartridge while the **Form Feed** light was on. To correct the error, remove the cartridge, reinsert it into the slot, and press the **Continue** button. For information on removing and reinserting the cartridge, see Chapter 3.

RESET

The printer's current interface port has been reset and the buffer cleared. However, other interface ports are still active and retain their settings or data.

RESET ALL

All printer settings have been reset to the specified settings. For information on specifying printer settings, see Chapter 4, "SelecType."

RESET TO SAVE

You have changed a SelecType setting but the new setting has not yet been enabled. To enable the new setting, hold down the Alt button and press **Reset**.

SELF TEST

The printer is performing an internal check cycle. Please wait a few seconds until the check is finished.

SERVICE REQ. XXXX

A controller error or a print engine error has been detected. Write down the error number listed on the display and turn off the printer. Wait at least five seconds and then turn it back on. If the error message still appears, turn off the printer, unplug the power cord, and contact a qualified service person.

STANDBY

The printer is currently in a low-power state. (When the printer is not used for 15 minutes, it enters standby mode.) Press any button or send data to warm up the printer. Warm-up takes approximately 30 seconds.

TONER LOW

The printer is almost out of toner. When you see this message, you must replace the imaging cartridge soon.

TONER OUT

You must replace the imaging cartridge. Replace it as described in the *Read This First* guide.

To print **one** additional page, press the **Continue** button.

WARMINGUP

The printer is warming up. Warm-up takes approximately 30 seconds.

Data Dump Mode

Data dump mode is a special feature that makes it easy for experienced users to find the cause of communication problems between the printer and the computer. In data dump mode the printer produces an exact printout in hexadecimal notation of the codes it receives.

1. Make sure paper is loaded and the printer is off.

2. Hold down the **On line** button while you turn on the printer. Make sure you hold the button down until **DUMP MODE** appears on the display.
3. Run any software program that causes the printer to print. Your printer prints out all the codes it receives in hexadecimal format.
4. To stop printing and turn off the data dump mode, press the **On line** button to go off line. Then turn off the printer after printing stops.

Optimizing Print Quality

Adjusting the RITech setting

Resolution Improvement Technology (RITech) is Epson's printer technology that produces smoother and crisper lines, text, and graphics.

RITech has four settings: **LIGHT**, **MEDIUM** (default), **DARK**, and **OFF**. The default setting produces the best text and graphics in most cases and should not normally have to be changed. However, adjusting the RITech setting can sometimes improve print quality.

Note:

RITech may not improve graphics that include gray shading or a screen pattern. If you are printing **gray** shading or screen patterns, you might **want** to change the **RITech** setting to **OFF**.

before adjusting the RITech setting, print a RITech test pattern to help you in determining which setting is best for you.

To print a RITech test pattern:

1. Enter SelectType by pressing the **Menu** button.
2. Press the **Menu** button several times until **TEST MENU** appears on the display.
3. Press the **Item** button until RITech **TEST PRINT** appears on the display.
4. Press the **Enter** button once. The printer prints a check pattern.

The check pattern is a rectangle with a pattern inside it, as shown below. When the RITech setting is best, you cannot see the pattern inside the rectangle.

STILL NEED ILLUSTRATION

Out of adjustment

Optimal setting

If the check pattern is out of adjustment, change the RITech setting or turn it off to improve print quality.

If your check pattern is too heavy, change the setting to LIGHT as described in the following procedure; if it is too light, change the setting to DARK; if you are printing gray shading or screen patterns, change the setting to OFF.

To change the RITech setting:

1. Press the **Menu** button once.
2. Press the **Item** button until RITech appears on the display.
3. Press the arrow button until you see the setting you want (LIGHT, MEDIUM, DARK, or OFF).
4. Press the **Enter** button to save the new setting, then press the **On Line** button.

Note:

If you see the message RESET TO SAVE, press the Reset button while you hold down the Alt button.

5. Reprint the RITech test pattern to see if the new setting has improved the check pattern.

If the pattern still needs to be improved, you probably need to change the print density setting. For a darker RITech setting, make the print density lighter and vice versa. See the next section, "Adjusting print density."

Adjusting print density

Note:

*Do not change the print density unless it is necessary. Changing the print density **affects** all text and graphics, so check the new setting by printing several pages with various kinds of text and graphics.*

If your test print pages are too light or too dark, adjust the print density as follows.

1. Enter SelectType by pressing the **Menu** button once.
2. Press the **Menu** button until CONFIG MENU appears on the display.
3. Press the **item** button until DENSITY appears on the display.

The DENSITY item will be shown with one of five settings: DARK, DARKEST, MIDDLE, LIGHT, and LIGHTEST.

4. Press the arrow button, or **Alt** and the arrow button together, to select a density setting. When you have selected the setting, press the **Enter** button.
5. Press the **On Line** button to put the printer back on line.

Note:

Increasing the print density increases toner consumption. If you select darker print, you may need to replace the imaging cartridge more often.

Cleaning the Printer

The printer needs only minimal cleaning. If you notice a decline in print quality, clean the glass lens and the inside of the printer as described in this section.

You should also clean the paper feeder and the printer cover every few months. These procedures are described later in this section.

Whenever you clean the printer or replace the components, print a status sheet from the TEST MENU as described in chapter 4.

Cleaning the inside of the printer

Fine particles of paper dust and ordinary dust can collect inside the printer. Follow the steps below to clean the inside of the printer and the paper feeder:

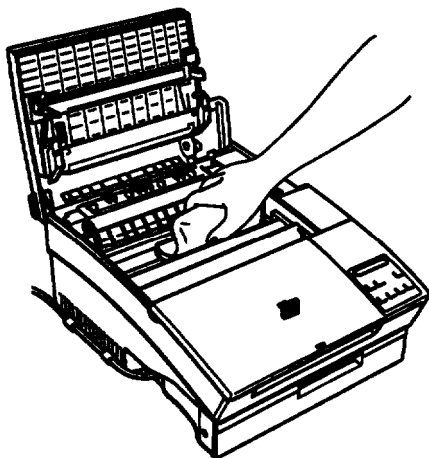
1. Make sure the printer is turned off.
2. Open the printer cover.



Warnings

Opening the printer exposes the fuser, which is marked by a CAUTION HOT SURFACE label. If you have used the printer recently, the fuser may be hot; be careful not to touch it. Let the printer cool before you clean inside it.

3. Remove the imaging cartridge from the printer.
4. Remove any dirt inside the printer with a soft, clean cloth. Do not use compressed air.



5. Replace the imaging cartridge.
6. Close the printer cover.

7. Open the paper cover, remove any pages, and clean the paper tray with a soft cloth.

Removing spilled toner

If toner spills inside the printer, do not use the printer until you remove all the spilled toner. Follow these steps:

1. If only a small amount of toner is present, carefully wipe out the inside of the printer with a clean, dry cloth.
2. If a large amount of toner is present, use a small vacuum cleaner (available from computer supply stores) to remove it. Then carefully wipe with a clean, dry cloth.



Caution:

Toner or any other fine powder can damage some *vacuum cleaners*. Be sure to read the instructions for your **vacuum cleaner** before you use it on spilled toner.

Note:

If you spill toner on your clothing, rinse it of with cold **water**. Do not use hot water; it may cause the toner to leave a permanent stain.

Cleaning the printer case

If the printer's outer case is dirty or dusty, turn off the printer and clean it with a soft, clean cloth dampened with a mild detergent.



Caution:

Never use alcohol or thinner to clean the printer cover; these chemicals **can** damage the components and the **case**. Be **careful** not to **get** water on the printer mechanism or any electronic components.

Appendix A

Technical Specifications

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Paper

Paper specifications

Note:

Since the *quality of any particular brand or type of paper may be changed by the manufacturer at any time, Epson cannot guarantee the use of any particular brand or type of paper. Always test samples of paper stock before purchasing Large quantities or printing large jobs.*

- Paper types:
- Plainpaper
 - Special paper
 - Labels
 - Envelopes
 - Transparencies
 - Colored paper
 - Card stock

Paper weight: Plain paper: 60 to 90 g/m², 16 to 24 lb
Card stock: 90 to 157 g/m², 24 to 42 lb
(single-sheet feed only)

Paper size:

Paper:	Type	Size
	A4	210 mm x 297 mm
	A5	148 mm x 210 mm
	B5	182 mm x 257 mm
	Letter	8.5 x 11 inches
	Half-Letter	5.5 x 8.5 inches
	Legal	8.5 x 14 inches
	Government Letter	8.5 x 10.5 inches
	Government Legal	8.5 x 13 inches
	Executive	7.25 x 10.5 inches
	F4	210 mm x 330 mm
Envelope:	Monarch	3 7/8 x 7 1/2 inches
	commercial 10	4 1/8 x 9 1/2 inches
	DL	110 mm x 220 mm
	C5	162 mm x 229 mm
	International B5	176 mm x 250 mm



Caution:
Do not load any size of paper other than those listed above.

Printable area:

LJ4 emulation	100 dots from paper edge
ESC/P 2, FX emulations	150 dots from paper edge

Note:

- If you are using A4 or F4 paper with the 80 columns setting with ESC/P 2 or FX emulations, the left, and right limits move to 100 dots from the left edge and 60 dots from the right edge, respectively.
- If you have selected GL-like emulation in the GL/2 emulation, the **default picture frame** and **had-clip limit** is reduced slightly.
- The above dot values are based on 600 dpi. When printing at 300 dpi, the dot values are halved.

Paper feed

Paper feed alignment and direction:	Center alignment for all sizes
Paper feed:	Automatic or manual feed
Input paper supply (75 g/m ² paper):	150 sheets (for standard built-in paper tray) 250 sheets (with optional lower paper cassette installed) 5-10 envelopes, depending on thickness
Paper eject:	Face down or face up (optional)
Paper eject capacity (75 g/m ² paper):	100 sheets face down 20 sheets face up with optional face-up output tray

Printer

General

Printing method:	Laser beam scanning and dry electrophotographic process
Resolution:	600 x 600 dpi or 300 x 300 dpi, switchable
Printing speed:	Up to 6 pages per minute depending on the font and quantity of data
First print:	Less than 20 seconds, face up or face down
Warm-up time:	35 seconds or less at normal temperature
Internal emulations:	<input type="checkbox"/> HP LaserJet 4 emulation <input type="checkbox"/> ESC/P 2 24-pin printer (LQ-570) emulation <input type="checkbox"/> ESC/P 9-pin printer (FX-870/1170) emulation <input type="checkbox"/> EpsonGL/2 emulation
Cartridge slot:	1 slot for font cartridges
Resident fonts:	45 (See Chapter 3 for a list of resident printer fonts.)
CPU:	MB86930, 17.6 MHz
RAM:	2.0 MB, expandable up to 64.0 MB

Environmental

Temperature:	Operation: 10 to 35°C (50 to 95°F) Storage: 0 to 35°C (32 to 95°F)
Humidity:	Operation: 30 to 85% RH Storage: 15 to 85% RH
Altitude:	2500 meters (8200 feet) maximum

Mechanical

Dimensions and weight:

Height: 226 mm (8.9 inches)
Width: 368 mm (14.5 inches)
Depth: 456 mm (18.0 inches)
Weight: Approx. 10 kg (22 lb) including the imaging cartridge.

Durability:

5 years or 180,000 sheets, whichever comes first.

Electrical

Voltage:

90 V to 132 V

Rated frequency:

50 Hz to 60 Hz \pm 3 Hz

Rated current:

5.0 A \pm 10%

Power consumption:

Less than 500 W (powers down to less than 30 W after 15 minutes of inactivity)

safety:

Applicable standards:

UL 1950

CSA 22.2 No. 950 Deviation 3

Laser radiation regulation:

FDA (NCDRH) Class 1

EMI FCC Part 15 Subpart B, Class B

Interface

Parallel interface

The parallel interface connector pin assignments and a description of the interface signals are shown in the table below.

Signal Pin	Return Pin	Signal	Direction	Description
1	19	STROBE	IN	STROBE pulse to read data. Pulse width must be at least 0.5 μ s at the receiving terminal.
2	20	DATA 1	IN	These signals represent parallel data bits 1 to 8, respectively. Each signal is at HIGH level when data is logical 1 and LOW when it is logical 0.
3	21	DATA 2	IN	
4	22	DATA 3	IN	
5	23	DATA 4	IN	
6	24	DATA 5	IN	
7	25	DATA 6	IN	
8	26	DATA 7	IN	
9	27	DATA 8	IN	
10	28	ACKNLG	OUT	About a 1-10- μ s pulse width. LOW indicates data has been received and the printer is ready to accept more data. The timing from BUSY signal can be changed by Selectype.
11	29	BUSY	OUT	A HIGH signal indicates that the printer cannot receive data. The signal goes HIGH in the following cases: 1. During printing 2. When off line 3. During a printer-error state
12	30	PE	OUT	A HIGH signal indicates the printer is out of paper.
13	-	SLCT	OUT	Pulled up to +5V through 3.3 k Ω resistance.

Signal Pin	Return Pin	Signal	Direction	Description
14	—	AUTO FEED	IN	Available only in ESC/P 2 and FX emulation. When LOW, the paper is automatically fed one line after each line of printing. (The signal level can be fixed in SelectType.)
15	—	NC	—	Not used
16	—	GND	—	Logic ground level
17	—	CHASSIS GND	—	Printer's chassis ground, which is connected to the signal ground.
18	—	NC	—	Not used
19-30	—	GND	—	Twisted-pair return signal ground level.
31	—	INIT	IN	When this signal goes LOW, the printer controller ignores the STROBE signal.
32	—	ERROR	OUT	This signal level goes LOW when the printer is: 1. Out of paper 2. In an error state 3. Off line
33	—	GND	—	Same as for Pins 19-30
34	—	NC	—	Not used
35	—	+5V	—	Pulled up to +5 V through 3.3 K Ω resistance.
36	—	SLCTIN	IN	Available only for bidirectional use.

Note:

- All interface conditions are timed on TTL level. Both the rise and fall times of each signal must be less than 0.2 *microseconds*.
- Data **transfer** must be carried out by observing the ACKNLG or BUSY signal. (Data transfer to this printer can be carried out only after receipt of the ACKNZG signal or when the level of the BUSY signal is LOW.)
- The column heading **Direction** *refers to the direction of signal flow as viewed from the printer.*

- ❑ *Return denotes the twisted-pair return to be connected at signal ground level. For the **interface** wiring, be sure to use a twisted-pair cable each signal **and** to complete the connection on the return side.*
- ❑ *The **ACKNLG** pulse width varies depending on the **SPEED** setting in **SelecType**.*

Serial interface

The printer's resident serial interface can be set for either RS-232C or RS-422 operation. These interfaces have the following characteristics:

Data format:

Word length:	7 or 8 bits
Parity:	None, odd, or even
Stop bits:	1 or 2
Printer ready protocol:	DTR, XON/XOFF, or both

You can set the data format using options and menu items in **SelecType**.

Baud rate (bits per second):	300,600,1200,2400,4800,9600,19200,38400,57600,76800,115200
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Note:

When using the serial interface as RS-232C, the availability of the baud rate value over 38400 depends on your computer's hardware reliability (including the interface cable). Epson does not recommend or guarantee the use of any particular brand of computer.

Signal level:	RS-232C: Conforms to EIA
Connector:	D-sub W-pin connector

Handshaking

The printer's serial interface can use DTR (Data Terminal Ready) signal levels and XON/XOFF communication protocols either separately or in combination. When the vacant area for data in the input buffer drops to 256 bytes, the printer outputs an XOFF code or sets the DTR signal level to low (MARK), indicating that the printer cannot receive more data.

Once the vacant area for data in the buffer recovers to 512 bytes, the printer outputs an XON code or sets the DTR flag to high (SPACE), indicating that the printer is again ready to receive data.

Error handling

A * character is printed if a parity error, framing error, or overrun error is detected.

Pin assignments

The serial interface connector pin assignments and a description of the interface signals are shown in the table below. The direction of signals is given relative to the printer.

Signal pin	RS-232C	RS-422	Direction	Description
1	FG		—	This line is connected to the printer chassis.
2	TXD		OUT	Transmits data. This pin transmits serial data from the printer to the computer.
3	RXD	(RD+)	IN	Receives data. This pin transmits serial data from the computer to the printer.
4	RTS		OUT	Request to send. This pin is held high by the printer.
5	CTS		IN	Always ignored.
6	DSR		IN	Data set ready. This pin indicates that the computer is ready to receive data from the printer. This signal can be set high with SelecType.

Signal pin	RS-232C	RS-422	Direction	Description
7	SG		—	Signal ground. This pin provides a ground for all the signal lines.
8	DCD		IN	Data carrier detect. Always ignored.
9		(SD+)	(OUT)	Send data. This pin sends serial data from the printer to the computer. The signal level is RS-422.
10		(SD-)	(OUT)	Send data. This pin sends serial data from the printer to the computer. The signal level is RS-422.
18		(RD-)	(IN)	Receive data. This pin transmits serial data from the computer to the printer. The signal level is RS-422.
20	DTR		OUT	Data terminal ready. This pin indicates whether or not the printer is ready to receive data. If the printer ready protocol is not selected (this pin is always high), the printer is ready to receive data. If the printer ready protocol is selected, the printer can accept data when the pin level is high and cannot accept data when the pin level is low. When the DTR signal goes low, the host computer must stop sending data within 128 characters. Can be set high or low with SelectType.

Although RTS, CTS, DTR, and DCD are designated as RS-232C signals, they can also be used when RS-422 is selected with SelectType.

RS-422-level signals shown in parentheses above can be set using SelectType.

Options and Consumables

lower paper cassette

Model number	C812301
Paper size:	Letter
Paper weight:	60 to 90 g/m ² (16 to 24 lb)
Paper feed:	Automatic feed delivery system. Cassette capacity up to 250 sheets (75 g/m ² or 20 lb paper).
Feeding speed:	For first sheet, 22 seconds or less. For subsequent sheets, 6 pages per minute.
Paper types:	Plain paper only. Do not load heavy paper, labels, or transparencies.
AC power supply:	DC 24 V supplied by the printer.
Dimensions (including printer) and weight:	Height: 297 mm (11.7 inches) Width: 368 mm (14.5 inches) Depths 480 mm (18.9 inches) including the cassette Weight: 2.8 kg (6.2 lb) including the cassette

Imaging cartridge

Model number:	S051016
Storage temperature:	0 to 35°C (32 to 95°F)
Storage humidity:	30 to 85 % RH
Shelf life:	18 months after production
Life:	Up to 6000 pages under the following conditions: Letter-size paper, continuous printing and 5% print ratio.

The number of pages you can print with an imaging cartridge varies depending on the type of printing. If you print a few pages at a time or print dense text exceeding the 5% print ratio, your cartridge may print fewer pages. The 5% print ratio is equivalent to double-spaced standard text.

Appendix B

Command Summary

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Supported Emulations and Control Languages

Your printer has the ability to emulate the following printers in each printer emulation:

LJ4	Hewlett-Packard LaserJet 4 (PCL 5e)
ESC/P 2	Epson LQ-570 (24pin)
FX	Epson FX 870/1170 (9-pin)
GL/2	Hewlett-Packard GL/2 graphics language

In addition, the following printer control languages are supported

PJL	Printer Job Language
EJL	Epson Job control Language

This appendix lists the available printer commands for these emulations. Most of the **commands** closely emulate the original printer or the control language; however, some have operational differences because the printers use different technologies. Footnotes are used to mark commands with differences. For additional information, see Chapter 5, "Using Other Printer Emulations."

LJ4 Emulation

This section lists the printer commands supported by LJ4 emulation.

LJ4 emulation commands

The following notes apply to various commands in the following command summary:

- These** commands are specific to the Epson ActionLaser 1600.
- See the Hewlett-Packard LaserJet 4 Technical Reference Manual **for** additional symbol sets
- Secondary printer commands are **specified as secondary** by using a **right parenthesis “)”** in the command instead of a left **parenthesis**.
- These** commands show the **Epson** font (typeface) family names. The **corresponding HP equivalents are** shown in **parentheses**.

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
Job control				
Reset	ESC E	—	027 069	1B 45
Number of copies	ESC &f#X	# = 1-99	027 038 108 #...# 088	1B 26 6C #...# 58
Long-edge (left) offset registration	ESC &f#U	# = 1/720" (decipoints)	027 038 108 #...# 085	1B 26 6C #...# 55
Short-edge (top) offset registration	ESC &f#Z	# = 1/720" (decipoints)	027 038 108 #...# 090	1B 26 6C #...# 5A
Unit of measure	ESC &u#D	# = No. of units per inch	027 038 117 #...# 068	1B 26 75 #...# 44

page control

Paper source ¹	ESC &f0H	Eject page	027 038 108 048 072	1B 26 6C 30 48
	ESC &f1H	Standard (upper) tray	027 038 108 049 072	1B 26 6C 31 48
	ESC &f2H	Manual feed	027 038 108 050 072	1B 26 6C 32 48
	ESC &f3H	Manual feed	027 038 108 051 072	1B 26 6C 33 48
	ESC &f4H	Optional (lower) paper cassette	027 038 108 052 072	1B 26 6C 34 48
	ESC &f5H	Optional (lower) paper cassette	027 038 108 053 072	1B 26 6C 35 48
Page size ¹	ESC &f1A	Executive	027 038 108 049 065	1B 26 6C 31 41
	ESC &f2A	Letter	027 038 108 050 065	1B 26 6C 32 41
	ESC &f3A	Legal	027 038 108 051 065	1B 26 6C 33 41
	ESC &f26A	A4	027 038 108 050 054 065	1B 26 6C 32 36 41
	ESC &f80A	Monarch	027 038 108 056 048 065	1B 26 6C 38 30 41
	ESC &f81A	COM 10	027 038 108 056 049 065	1B 26 6C 38 31 41
	ESC &f90A	International DL	027 038 108 057 048 065	1B 26 6C 39 30 41
	ESC &f91A	International C5	027 038 108 057 049 065	1B 26 6C 39 31 41
	ESC &f100A	International B5	027 038 108 049 048 048 065	1B 26 6C 31 30 30 41
Page length	ESC &f#P	# = No. of lines (5-128)	027 038 108 #...# 080	1B 26 6C #...# 50

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
Orientation	ESC &f0O	Portrait	027 038 108 048 079	1B 26 6C 30 4F
	ESC &f1O	Landscape	027 038 108 049 079	1B 26 6C 31 4F
	ESC &f2O	Reverse Portrait	027 038 108 050 079	1B 26 6C 32 4F
	ESC &f3O	Reverse Landscape	027 038 108 051 079	1B 26 6C 33 4F
Print direction	ESC &a#P	# = Degrees of rotation counter-clockwise in 90° increments	027 038 097 #...# 080	1B 26 61 #...# 50
Top margin	ESC &f#E	# = No. of lines	027 038 108 #...# 069	1B 26 6C #...# 45
Text length	ESC &f#F	# = No. of lines	027 038 108 #...# 070	1B 26 6C #...# 46
Left margin	ESC &a#L	# = No. of columns	027 038 097 #...# 076	1B 26 61 #...# 4C
Right margin	ESC &a#M	# = No. of columns	027 038 097 #...# 077	1B 26 61 #...# 4D
Clear Horizontal margins	ESC 9	—	027 057	1B 39
Performance skip	ESC &f0L	Disable	027 038 108 048 076	1B 26 6C 30 4C
	ESC &f1L	Enable	027 038 108 049 076	1B 26 6C 31 4C
Horizontal Motion Index (HMI)	ESC &ek#H	# = No. of 1/120" increments	027 038 107 #...# 072	1B 26 6B #...# 48
Vertical Motion Index (VMI)	ESC &f#C	# = No. of 1/48" increments	027 038 108 #...# 067	1B 26 6C #...# 43
Line spacing	ESC &f1D	1 line/inch	027 038 108 049 068	1B 26 6C 31 44
	ESC &f2D	2 lines/inch	027 038 108 050 068	1B 26 6C 32 44
	ESC &f3D	3 lines/inch	027 038 108 051 068	1B 26 6C 33 44
	ESC &f4D	4 lines/inch	027 038 108 052 068	1B 26 6C 34 44
	ESC &f6D	6 lines/inch	027 038 108 054 068	1B 26 6C 36 44
	ESC &f8D	8 lines/inch	027 038 108 056 068	1B 26 6C 38 44
	ESC &f12D	12 lines/inch	027 038 108 049 050 068	1B 26 6C 31 32 44
	ESC &f16D	16 lines/inch	027 038 108 049 054 068	1B 26 6C 31 36 44
	ESC &f24D	24 lines/inch	027 038 108 050 052 068	1B 26 6C 32 34 44
	ESC &f48D	48 lines/inch	027 038 108 052 056 068	1B 26 6C 34 38 44

Cursor positioning

Vertical position	ESC &a#R	# = No. of rows	027 038 097 #...# 082	1B 26 61 #...# 52
	ESC ^#Y	# = No. of dots	027 042 112 #...# 089	1B 2A 70 #...# 59
	ESC &a#V	# = No. of decipoints	027 038 097 #...# 086	1B 26 61 #...# 56

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
Horizontal position	ESC &a#C	# = No. of columns	027 038 097 #...# 067	1B 26 61 #...# 43
	ESC *p#X	# = No. of dots	027 042 112 #...# 088	1B 2A 70 #...# 58
	ESC &a#H	# = No. of decipoints	027 038 097 #...# 072	1B 26 61 #...# 48
Half line feed	ESC =	—	027 061	1B 3D
Line termination	ESC &k0G	CR=CR; LF=LF; FF=FF	027 038 107 048 071	1B 26 6B 30 47
	ESC &k1G	CR=CR+LF; LF=LF; FF=FF	027 038 107 049 071	1B 26 6B 31 47
	ESC &k2G	CR=CR; LF=CR+LF; FF=CR+LF	027 038 107 050 071	1B 26 6B 32 47
	ESC &k3G	CR=CR+LF; LF=CR+LF; FF=CR+FF	027 038 107 051 071	1B 26 6B 33 47
Push/Pop position	ESC &f0S	Push	027 038 102 048 083	1B 26 66 30 53
	ESC &f1S	Pop	027 038 102 049 083	1B 26 66 31 53

Font selection

Primary symbol set ^{2,3}	ESC (0D	ISO 60: Norwegian 1	027 040 048 068	1B 28 30 44
	ESC (1E	ISO 4: United Kingdom	027 040 049 069	1B 28 31 45
	ESC (9E	Windows 3.1 Latin 2	027 040 057 069	1B 28 39 45
	ESC (1F	ISO 69: French	027 040 049 070	1B 28 31 46
	ESC (1G	ISO 21: German	027 040 049 071	1B 28 31 47
	ESC (0I	ISO 15: Italian	027 040 048 073	1B 28 30 49
	ESC (6J	Microsoft Publishing	027 040 054 074	1B 28 36 4A
	ESC (7J	DeskTop	027 040 055 074	1B 28 37 4A
	ESC (10J	PS Text	027 040 049 048 074	1B 28 31 30 4A
	ESC (12J	MC Text	027 040 049 050 074	1B 28 31 32 4A
	ESC (13J	Ventura International	027 040 049 051 074	1B 28 31 33 4A
	ESC (14J	Ventura US	027 040 049 052 074	1B 28 31 34 4A
	ESC (579L	Wingdings	027 040 053 055 057 076	1B 28 35 37 39 4C
	ESC (5M	PS Math	027 040 053 077	1B 28 35 4D
	ESC (6M	Ventura Math	027 040 054 077	1B 28 36 4D
	ESC (8M	Math-8	027 040 056 077	1B 28 38 4D
	ESC (19M	Symbol	027 040 049 057 077	1B 28 31 39 4D
	ESC (0N	ISO 8859-1: (ECMA-94) Latin 1	027 040 048 078	1B 28 30 4E

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
	ESC (2N	ISO 8859-2: Latin 2	027 040 050 078	1B 28 32 4E
	ESC (5N	ISO 8859-9: Latin 5	027 040 053 078	1B 28 35 4E
	ESC (0S	ISO 11: Swedish	027 040 048 083	1B 28 30 53
	ESC (2S	ISO 17: Spanish	027 040 050 083	1B 28 32 53
	ESC (5T	Windows 3.1 Latin 5	027 040 053 084	1B 28 35 54
	ESC (9T	PC Turkish	027 040 057 084	1B 28 39 54
	ESC (0U	ISO 6: ASCII	027 040 048 085	1B 28 30 55
	ESC (1U	Legal	027 040 049 085	1B 28 31 55
	ESC (8U	Roman-8	027 040 056 085	1B 28 38 55
	ESC (9U	Windows 3.0 Latin 1	027 040 057 085	1B 28 39 55
	ESC (10U	PC-8	027 040 049 048 085	1B 28 31 30 55
	ESC (11U	PC-8 D/N	027 040 049 049 085	1B 28 31 31 55
	ESC (12U	PC 850	027 040 049 050 085	1B 28 31 32 55
	ESC (15U	Pi Font	027 040 049 053 085	1B 28 31 35 55
	ESC (17U	PC-852	027 040 049 055 085	1B 28 31 37 55
	ESC (19U	Windows 3.1 Latin 1 (ANSI)	027 040 049 057 085	1B 28 31 39 55
Primary spacing	ESC (§1P	Proportional	027 040 115 049 080	1B 28 73 31 50
	ESC (§0P	Fixed	027 040 115 048 080	1B 28 73 30 50
Primary pitch	ESC (§#H	# = No. of characters/ inch	027 040 115 #...# 072	1B 28 73 #...# 48
Set pitch mode	ESC &k0S	10.0	027 038 107 048 083	1B 26 6B 30 53
	ESC &k2S	Compressed (16.5-16.7)	027 038 107 050 083	1B 26 6B 32 53
	ESC &k4S	Elite (12.0)	027 038 107 052 083	1B 26 6B 34 53
Primary height	ESC (§#V	# = No. of points	027 040 115 #...# 086	1B 28 73 #...# 56
Primary style	ESC (§0S	Upright (solid)	027 040 115 048 083	1B 28 73 30 53
	ESC (§1S	Italic	027 040 115 049 083	1B 28 73 31 53
	ESC (§4S	Condensed	027 040 115 052 083	1B 28 73 34 53
	ESC (§5S	Condensed Italic	027 040 115 053 083	1B 28 73 35 53
	ESC (§8S	Compressed (Extra Condensed)	027 040 115 056 083	1B 28 73 38 53
	ESC (§24S	Expanded	027 040 115 050 052 083	1B 28 73 32 34 53
	ESC (§32S	Outline	027 040 115 051 050 083	1B 28 73 33 32 53
	ESC (§64S	Inline	027 040 115 054 052 083	1B 28 73 36 34 53

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>	
	ESC (s128S	Shadowed	027 040 115 049 050 056 083	1B 28 73 31 32 38 53	
	ESC (s160S	Outline Shadowed	027 040 115 049 054 048 083	1B 28 73 31 36 30 53	
Primary font stroke weight	ESC (s-7B	Ultra thin	027 040 115 045 055 066	1B 28 73 2D 37 42	
	ESC (s-6B	Extra thin	027 040 115 045 054 066	1B 28 73 2D 36 42	
	ESC (s-5B	Thin	027 040 115 045 053 066	1B 28 73 2D 35 42	
	ESC (s-4B	Extra light	027 040 115 045 052 066	1B 28 73 2D 34 42	
	ESC (s-3B	Light	027 040 115 045 051 066	1B 28 73 2D 33 42	
	ESC (s-2B	Demi light	027 040 115 045 050 066	1B 28 73 2D 32 42	
	ESC (s-1B	Semi light	027 040 115 045 049 066	1B 28 73 2D 31 42	
	ESC (s0B	Medium (book or text)	027 040 115 048 066	1B 28 73 30 42	
		ESC (s1B	Semi bold	027 040 115 049 066	1B 28 73 31 42
		ESC (s2B	Demi bold	027 040 115 050 066	1B 28 73 32 42
	ESC (s3B	Bold	027 040 115 051 066	1B 28 73 33 42	
	ESC (s4B	Extra bold	027 040 115 052 066	1B 28 73 34 42	
	ESC (s5B	Black	027 040 115 053 066	1B 28 73 35 42	
	ESC (s6B	Extra black	027 040 115 054 066	1B 28 73 36 42	
	ESC (s7B	Ultra black	027 040 115 055 066	1B 28 73 37 42	
Primary typeface family ⁴	ESC (s4362T	Flares821 (Albertus)	027 040 115 052 051 054 050 084	1B 28 73 34 33 36 32 54	
	ESC (s4168T	Incised901 (Antique Olive)	027 040 115 052 049 054 056 084	1B 28 73 34 31 36 38 54	
	ESC (s4140T	Clarendon Cn (Clarendon)	027 040 115 052 049 052 048 084	1B 28 73 34 31 34 30 54	
	ESC (s4116T	Ribbon131 (Coronet)	027 040 115 052 049 049 054 084	1B 28 73 34 31 31 36 54	
	ESC (s4099T	Courier (Courier)	027 040 115 052 048 057 057 084	1B 28 73 34 30 39 39 54	
	ESC (s4197T	OrigGaram (Garamond Antiqua)	027 040 115 052 049 057 055 084	1B 28 73 34 31 39 37 54	
	ESC (s4102T	LetterGoth (Letter Gothic)	027 040 115 052 049 048 050 084	1B 28 73 34 31 30 32 54	
	ESC (s4297T	Audrey Two (Marigold)	027 040 115 052 050 057 055 084	1B 28 73 34 32 39 37 54	
	ESC (s4113T	ZpHuma601 (CG Omega)	027 040 115 052 049 049 051 084	1B 28 73 34 31 31 33 54	
	ESC (s4101T	Dutch801 (CG Times)	027 040 115 052 049 048 049 084	1B 28 73 34 31 30 31 54	
	ESC (s4148T	Swiss742 (Univers)	027 040 115 052 049 052 056 084	1B 28 73 34 31 34 38 54	
	ESC (s16602T	Swiss721 (Arial)	027 040 115 049 054 054 048 050 084	1B 28 73 31 36 36 30 32 54	

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
	ESC (s16901T	Dutch801 (Times New Roman)	027 040 115 049 054 057 048 049 084	1B 28 73 31 36 39 30 31 54
	ESC (s16686T	Symbol Set (Symbol)	027 040 115 049 054 054 056 054 084	1B 28 73 31 36 36 38 36 54
	ESC (s31402T	MoreWingBats (Wingdings)	027 040 115 051 049 052 048 050 084	1B 28 73 33 31 34 30 32 54
Font default	ESC (3@	Primary font	027 040 051 064	1B 28 33 40
	ESC)3@	Secondary font	027 041 051 064	1B 29 33 40
Underline	ESC &d0D	Enable fixed	027 038 100 048 068	1B 26 64 30 44
	ESC &d3D	Enable floating	027 038 100 051 068	1B 26 64 33 44
	ESC &d@	Disable	027 038 100 064	1B 26 64 40
Transparent print data	ESC &p#X [Data]	# = No. of bytes	027 038 112 #...# 088	1B 26 70 #...# 58

font management

Assign font ID	ESC *c#D	# = Font ID number	027 042 099 #...# 068	1B 2A 63 #...# 44
Font and character control	ESC *c0F	Delete all fonts	027 042 099 048 070	1B 2A 63 30 46
	ESC *c1F	Delete all temporary fonts	027 042 099 049 070	1B 2A 63 31 46
	ESC *c2F	Delete last font ID specified	027 042 099 050 070	1B 2A 63 32 46
	ESC *c3F	Delete last character specified	027 042 099 051 070	1B 2A 63 33 46
	ESC *c4F	Make font temporary	027 042 099 052 070	1B 2A 63 34 46
	ESC *c5F	Make font permanent	027 042 099 053 070	1B 2A 63 35 46
	ESC *c6F	Copy/assign the currently invoked font as temporary	027 042 099 054 070	1B 2A 63 36 46
Select font (with ID #)	ESC (#X	# = ID number for primary font	027 040 #...# 088	1B 28 #...# 58
	ESC)#X	# = ID number for secondary font	027 041 #...# 088	1B 29 #...# 58
Set Symbol Set	ESC *c#R	ID #	027 042 099 #...# 082	1B 2A 63 #...# 52
Define Symbol Set	ESC (##W [Data]	# = Bytes	027 040 102 #...# 087	1B 28 66 #...# 57
Symbol Set Control	ESC *c0S	Delete all symbol sets	027 042 099 048 083	1B 2A 63 30 53

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
	ESC *c1S	Delete all temporary symbol sets	027 042 099 049 083	1B 2A 63 31 53
	ESC *c2S	Delete current soft symbol set (last ID#)	027 042 099 050 083	1B 2A 63 32 53
	ESC *c4S	Make current soft symbol set temporary	027 042 099 052 083	1B 2A 63 34 53
	ESC *c5S	Make current soft symbol set permanent	027 042 099 053 083	1B 2A 63 35 53

soft font creation

Font descriptor (font header)	ESC (s#W [Data]	# = No. of bytes	027 041 115 #...# 087	1B 29 73 #...# 57
Download character	ESC (s#W [Data]	# = No. of bytes	027 040 115 #...# 087	1B 28 73 #...# 57
Character code	ESC *c#E	# = Character code (decimal)	027 042 099 #...# 069	1B 2A 63 #...# 45

Raster graphics

Raster resolution	ESC *r75R	75 dots/inch	027 042 116 055 053 082	1B 2A 74 37 35 52
	ESC *r100R	100 dots/inch	027 042 116 049 048 048 082	1B 2A 74 31 30 30 52
	ESC *r150R	150 dots/inch	027 042 116 049 053 048 082	1B 2A 74 31 35 30 52
	ESC *r200R	200 dots/inch	027 042 116 050 048 048 082	1B 2A 74 32 30 30 52
	ESC *r300R	300 dots/inch	027 042 116 051 048 048 082	1B 2A 74 33 30 30 52
	ESC *r600R	600 dots/inch	027 042 116 054 048 048 082	1B 2A 74 36 30 30 52
Raster graphics presentation	ESC *r0F	Follows orientation	027 042 114 048 070	1B 2A 72 30 46
	ESC *r3F	Follows physical page	027 042 114 051 070	1B 2A 72 33 46
Start raster graphics	ESC *r0A	Left raster graphics margin	027 042 114 048 065	1B 2A 72 30 41
	ESC *r1A	Current cursor	027 042 114 049 065	1B 2A 72 31 41
Raster Y offset	ESC *b#Y	# = No. of raster lines of vertical movement	027 042 098 #...# 089	1B 2A 62 #...# 59
Set Raster compression mode	ESC *b0M	Unencoded	027 042 098 048 077	1B 2A 62 30 4D
	ESC *b1M	Run-Length encoded	027 042 098 049 077	1B 2A 62 31 4D
	ESC *b2M	Tagged image file format	027 042 098 050 077	1B 2A 62 32 4D
	ESC *b3M	Delta row	027 042 098 051 077	1B 2A 62 33 4D

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
	ESC *b5M	Adaptive compression	027 042 098 053 077	1B 2A 62 35 4D
Transfer raster data	ESC *b#W[Data]	# = No. of bytes	027 042 098 #...# 087	1B 2A 62 #...# 57
End raster graphics	ESC *rB	Old version	027 042 114 066	1B 2A 72 42
	ESC *rC	Preferred	027 042 114 067	1B 2A 72 43
Raster graphics height	ESC *r#T	# = No. of raster rows	027 042 114 #...# 084	1B 2A 72 #...# 54
Raster graphics width	ESC *r#S	# = Pixels of the specified resolution	027 042 114 #...# 083	1B 2A 72 #...# 53

Print model

Select current pattern	ESC *v0T	Solid black (default)	027 042 118 048 084	1B 2A 76 30 54
	ESC *v1T	Solid white	027 042 118 049 084	1B 2A 76 31 54
	ESC *v2T	Shading pattern	027 042 118 050 084	1B 2A 76 32 54
	ESC *v3T	Cross-hatch pattern	027 042 118 051 084	1B 2A 76 33 54
	ESC *v4T	User-defined pattern	027 042 118 052 084	1B 2A 76 34 54
Select source transparency mode	ESC *v0N	Transparent	027 042 118 048 078	1B 2A 76 30 4E
	ESC *v1N	Opaque	027 042 118 049 078	1B 2A 76 31 4E
Select pattern transparency mode	ESC *v0O	Transparent	027 042 118 048 079	1B 2A 76 30 4F
	ESC *v1O	Opaque	027 042 118 049 079	1B 2A 76 31 4F
Rectangle width	ESC *c#A	# = No. of dots	027 042 099 #...# 065	1B 2A 63 #...# 41
	ESC *c#H	# = No. of decipoints	027 042 099 #...# 072	1B 2A 63 #...# 48
Rectangle height	ESC *c#B	# = No. of dots	027 042 099 #...# 066	1B 2A 63 #...# 42
	ESC *c#V	# = No. of decipoints	027 042 099 #...# 086	1B 2A 63 #...# 56
Fill rectangular area	ESC *c0P	Solid Black	027 042 099 048 080	1B 2A 63 30 50
	ESC *c1P	Erase (solid white area fill)	027 042 099 049 080	1B 2A 63 31 50
	ESC *c2P	Shaded fill	027 042 099 050 080	1B 2A 63 32 50
	ESC *c3P	Cross-hatch fill	027 042 099 051 080	1B 2A 63 33 50
	ESC *c4P	User-defined	027 042 099 052 080	1B 2A 63 34 50
	ESC *c5P	Current pattern	027 042 099 053 080	1B 2A 63 35 50
Pattern ID	ESC *c#G	% of shading or type of pattern or user pattern ID	027 042 099 #...# 071	1B 2A 63 #...# 47

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
Shading	ESC *c2G	2% gray	027 042 099 050 071	1B 2A 63 32 47
	ESC *c10G	10% gray	027 042 099 049 048 071	1B 2A 63 31 30 47
	ESC *c15G	15% gray	027 042 099 049 053 071	1B 2A 63 31 35 47
	ESC *c30G	30% gray	027 042 099 051 048 071	1B 2A 63 33 30 47
	ESC *c45G	45% gray	027 042 099 052 053 071	1B 2A 63 34 35 47
	ESC *c70G	70% gray	027 042 099 055 048 071	1B 2A 63 37 30 47
	ESC *c90G	90% gray	027 042 099 057 048 071	1B 2A 63 39 30 47
	ESC *c100G	100% gray	027 042 099 049 048 048 071	1B 2A 63 31 30 30 47
Pattern	ESC *c1G	1 horiz. line	027 042 099 049 071	1B 2A 63 31 47
	ESC *c2G	2 vert. lines	027 042 099 050 071	1B 2A 63 32 47
	ESC *c3G	3 diagonal lines	027 042 099 051 071	1B 2A 63 33 47
	ESC *c4G	4 diagonal lines	027 042 099 052 071	1B 2A 63 34 47
	ESC *c5G	5 square grid	027 042 099 053 071	1B 2A 63 35 47
	ESC *c6G	6 diagonal grid	027 042 099 054 071	1B 2A 63 36 47

User-defined pattern/management creation

Define pattern	ESC *c#W [Data]	# = No. of bytes	027 042 099 #...# 087	1B 2A 63 #...# 57
User-defined pattern control	ESC *c0Q	Delete all patterns	027 042 099 048 081	1B 2A 63 30 51
	ESC *c1Q	Delete all temporary patterns	027 042 099 049 081	1B 2A 63 31 51
	ESC *c2Q	Delete current pattern	027 042 099 050 081	1B 2A 63 32 51
	ESC *c4Q	Make pattern temporary	027 042 099 052 081	1B 2A 63 34 51
	ESC *c5Q	Make pattern permanent	027 042 099 053 081	1B 2A 63 35 51
Set pattern reference	ESC *p0R	Rotate with orientation	027 042 112 048 082	1B 2A 70 30 52
Point	ESC *p1R	Follow physical page	027 042 112 049 082	1B 2A 70 31 52

Macros

Macro ID	ESC &f#Y	#=Macro ID number	027 038 102 #...# 089	1B 26 66 #...# 59
Macro control	ESC &f0X	Start macro def.	027 038 102 048 088	1B 26 66 30 58
	ESC &f1X	Stop macro def.	027 038 102 049 088	1B 26 66 31 58
	ESC &f2X	Execute macro	027 038 102 050 088	1B 26 66 32 58
	ESC &f3X	Call macro	027 038 102 051 088	1B 26 66 33 58
	ESC &f4X	Enable overlay	027 038 102 052 088	1B 26 66 34 58
	ESC &f5X	Disable overlay	027 038 102 053 088	1B 26 66 35 58

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
	ESC öX	Delete macros	027 038 102 054 088	1B 26 66 36 58
	ESC ÷X	Delete all temp. macros	027 038 102 055 088	1B 26 66 37 58
	ESC øX	Delete macro ID	027 038 102 056 088	1B 26 66 38 58
	ESC ùX	Make temporary	027 038 102 057 088	1B 26 66 39 58
	ESC ༐X	Make permanent	027 038 102 049 048 088	1B 26 66 31 30 58

Status readback

Set status readback location type	ESC *#0T	Invalid location	027 042 115 048 084	1B 2A 73 30 54
	ESC *#1T	Currently selected	027 042 115 049 084	1B 2A 73 31 54
	ESC *#2T	All locations	027 042 115 050 084	1B 2A 73 32 54
	ESC *#3T	Internal	027 042 115 051 084	1B 2A 73 33 54
	ESC *#4T	Downloaded	027 042 115 052 084	1B 2A 73 34 54
	ESC *#5T	Cartridge	027 042 115 053 084	1B 2A 73 35 54
	ESC *#7T	User-installed ROM (SIMMs)	027 042 115 055 084	1B 2A 73 37 54
Set status readback location unit	ESC *#0U	All entities of the Location Type	027 042 115 048 085	1B 2A 73 30 55
	ESC *#1U	Entity 1 or Temporary	027 042 115 049 085	1B 2A 73 31 55
	ESC *#2U	Entity 2 or Permanent	027 042 115 050 085	1B 2A 73 32 55
	ESC *#3U	Entity 3	027 042 115 051 085	1B 2A 73 33 55
Inquire status readback entity	ESC *#4U	Entity 4	027 042 115 052 085	1B 2A 73 34 55
	ESC *#0I	Font	027 042 115 048 073	1B 2A 73 30 49
	ESC *#1I	Macro	027 042 115 049 073	1B 2A 73 31 49
	ESC *#2I	User-defined pattern	027 042 115 050 073	1B 2A 73 32 49
	ESC *#3I	Symbol set	027 042 115 051 073	1B 2A 73 33 49
	ESC *#4I	Font extended	027 042 115 052 073	1B 2A 73 34 49
Flush all pages	ESC &#r0F	Flush all complete pages	027 038 114 048 070	1B 26 72 30 46
	ESC &#r1F	Flush all page data	027 038 114 049 070	1B 26 72 31 46
Free memory space	ESC *#1M	—	027 042 115 049 077	1B 2A 73 31 4D
Echo	ESC *##X	# = Echo value (-32767 to 32767)	027 042 115 #...# 088	1B 2A 73 #...# 58

<i>Function</i>	<i>Command</i>	<i>Parameter</i>	<i>Decimal value</i>	<i>Hexadecimal value</i>
Programming hints				
End of line wrap	ESC �C	Enabled	027 038 115 048 067	1B 26 73 30 43
	ESC C	Disabled	027 038 115 049 067	1B 26 73 31 43
Display functions	ESC Y	ON	027 089	1B 59
	ESC Z	OFF	027 090	1B 5A
Nondisclosed command	ESC z	Self test		

Vector graphics

Enter GL/2 emulation	ESC %0B	Use previous GL/2 pen position	027 037 048 066	1B 25 30 42
	ESC %1B	Use current PCL cursor position	027 037 049 066	1B 25 31 42
GL/2 emulation plot horizontal size	ESC *c#K	# = Horizontal size in inches	027 042 099 #...# 075	1B 2A 63 #...# 4B
GL/2 emulation plot vertical size	ESC *c#L	# = Vertical size in inches	027 042 099 #...# 076	1B 2A 63 #...# 4C
Set picture frame anchor point	ESC *c0T	Set anchor point to CAP	027 042 099 048 084	1B 2A 63 30 54
Picture frame horizontal size	ESC *c#X	# = Decipoints	027 042 099 #...# 088	1B 2A 63 #...# 58
Picture frame vertical size	ESC *c#Y	# = Decipoints	027 042 099 #...# 089	1B 2A 63 #...# 59

Control codes

Backspace	BS	
Line feed	LF	
Form feed	FF	
Carriage return	CR	
Shift in	SI	Select primary font
Shift out	SO	Select secondary font
Horizontal tab	HT	
Escape	ESC	
Space	SP	

GL/2 emulation context commands

Configuration and status group

Input P1 and P2 IP
Input relative IR
P1 and P2
scale SC
Input window IW
Rotate RO
coordinate
system
Initialize IN
Default values DF
comment co

fine and fill attributes group

Line attributes **LA**
Line type LT
User defined UL
line type
Select pen SP
Pen width PW
Pen width unit WU
selection
Fill type FT
Screened SV¹
Vectors
Raster fill RF
definition
Anchor corner AC
Symbolmode SM
Transparency TR
mode

vector group

Pen down PD
Pen up PU
Plot absolute PA
Plot relative PR

Function *Command*

Arc absolute A A

Arc relative A R

Absolute arc three point A T

Relative arc three point R T

Circle CI²

Polyline encoded PE

Bezier absolute BZ

Bezier relative BR

Polygon group

Edge rectangle absolute E A

Edge rectangle relative E R

Fill rectangle absolute R A

Fill rectangle relative R R

Edge wedge E W

Fill wedge W G

Polygon mode P M

Edge polygon E P

Fill polygon FF

Character group

Standard font definition SD

Alternate font definition A D

Primary font (standard font) FI³

Secondary font (alternate font) FN³

Select standard font SS

Select alternate font SA

Scalable or bitmap font S B³

Absolute direction DI

Function	Command
Relative direction	DR
Absolute character size	SI
Relative character size	SR
Character slant	SL
Character fill mode	C F
Label	LB
Define label terminator	DT
Label origin	LO
Definevariable text path	DV
Extra space	Es
character plot	CP
Transparent data	TD

Dual context extension

Enter mode	PCL ESC % A
Reset	ESC E

¹ Palette extension command

² Polygon group **command**

³ **Dudcontextertensimcommand**

Epson ESC/P 2 and FX Emulations

This section lists the control codes supported in the ESC/P 2 and FX emulations. Some ESC/P 2 and FX printer codes are not available, either because the functions are not required (such as draft printing) or are not possible because of the different technologies used in these printers.

If a command has no parameters, it is merely listed. If it has parameters, they are explained. The parameters are indicated by lowercase italicized letters, usually *n*. The examples below show how the parameters are indicated.

ESC @ is a command with no parameters.

ESC U 1/0 is a command that uses 1 to turn the feature on and 0 to turn it Off.

ESC K *n1 n2* is a command with two parameters.

ESC D *m* is a command with a variable number of parameters.

Note:

Although additional commands not shown on **the following** list are supported, they are not recommended and are provided only for **compatibility** with older printers.

Epson ESC/P 2 emulation

<i>Function</i>	<i>Command</i>
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General operation

Initialize printer	ESC @
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Control paper loading/ejecting	ESC EM <i>n</i>
--------------------------------	-----------------

Paper feeding

carriage-	CR
-----------	----

Form feed	FF
-----------	----

Line feed	LF
-----------	----

<i>Function</i>	<i>Command</i>
Select 1/8-inch line spacing	ESC 0
Select 1/6-inch line spacing	ESC 2
Set <i>n</i> /180-inch line spacing	ESC 3 <i>n</i>
Set <i>n</i> /360-inch line spacing	ESC + <i>n</i>

Page format

Set page format	ESC (c <i>nn</i>
Set page length in defined units	ESC (C <i>nn</i>
Set page length in lines	ESC C <i>n</i>
Set page length in inches	ESC C 0 <i>n</i>
Set bottom margin for continuous paper	ESC N <i>n</i>
Cancel top/bottom margin for continuous paper	ESC O
Set left margin	ESC I <i>n</i>
Set right margin	ESC Q <i>n</i>

Print position motion

Set absolute horizontal print position	ESC \$ <i>n1 n2</i>
Set relative horizontal print position	ESC \ <i>n1 n2</i>
Set absolute vertical print position	ESC (V <i>nn</i>
Set relative vertical print position	ESC (v <i>nn</i>

<i>Function</i>	<i>Command</i>
Set horizontal tabs	ESC D <i>n</i>
Tab horizontally	HT
Set vertical tabs	ESC B <i>n</i>
Tab vertically	VT
Advance paper <i>n</i> /180-inch	ESC J <i>n</i>

Font selection

Select typeface	ESC k <i>n</i>
Select font by pitch and point	ESC X <i>n</i>
Select 10.5 point, 10 cpi	ESC P
Select 10.5 point, 12 cpi	ESC M
Select 10.5 point, 15 cpi	ESC g
Turn proportional mode on/off	ESC p 1/0
Select LQ or draft	ESC x <i>n</i>
Select italic font	ESC 4
Cancel italic font	ESC 5
Select bold font	ESC E
Cancel bold font	ESC F
Master select	ESC ! <i>n</i>

Font enhancement

Select condensed printing	SI
Cancel condensed printing	DC2

<i>Function</i>	<i>Command</i>
Select double-width printing	SO
Turn double-width printing on/off	ESC W1/0
Cancel double-width printing	DC4
Turn double-height printing on/off	ESC w 1/0
Select double-strike printing	ESC G
Cancel double-strike printing	ESC H
Select superscript printing	ESC S 0
Select subscript printing	ESC S 1
Cancel superscript/subscript printing	ESC T
Select line/score	ESC (- <i>nn</i>
Turn underline on/off	ESC - 1/0
Select character style	ESC q <i>n</i>

Spacing

Set intercharacter space	ESC SP <i>n</i>
Define unit	ESC (U <i>nn</i>
Set horizontal motion index (HMI)	ESC c <i>n1 n2</i>

Character handling

Assign character table	ESC (t <i>nn</i>
Select character table	ESC t <i>n</i>

<i>Function</i>	<i>Command</i>
select an international character set	ESC R <i>nn</i>
Define user-defined character	ESC & <i>nn</i>
Copy ROM to RAM	ESC : 0 <i>n</i> 0
Select user-defined set	ESC % <i>n</i>
Enable printing of upper control codes	ESC 6
Enable upper control codes	ESC 7
Print data as characters	ESC (^ <i>nn</i>

Bit huge

Select bit image	ESC * <i>nn</i>
Select graphic mode	ESC (G <i>nn</i>
Print raster graphics	ESC . <i>nn</i>

Epson FX emulation

Printer operation

Initialize printer	ESC @
Disable paper end detector	ESC 8
Enable paper end detector	ESC 9
Control paper loading/ejecting	ESC EM <i>n</i>

Function *Command*

Data control

Carriage return CR

Vertical motion

Form feed FF

Set page length in lines ESC C *n*

Set page length in inches ESC C 0 *n*

Set skip over perforation ESC N *n*

Cancel skip over perforation ESC O

Line feed LF

Select 1/8-inch line spacing ESC 0

Select 7/72-inch line spacing ESC 1

Select 1/6-inch line spacing ESC 2

Set *n*/216-inch line spacing ESC 3 *n*

Perform *n*/216-inch line spacing ESC + *n*

Tab vertically VT

Set vertical tabs ESC B *n*

Note:

Your printer will not print characters beyond one page length (set with the ESC C or ESC CD commands), while an FX printer might print them.

Function *Command*

Horizontal motion

Set absolute horizontal print position ESC \$ *n*1 *n*2

Set relative horizontal print position ESC \ *n*1 *n*2

Set left margin ESC / *n*

Set right margin ESC Q *n*

Tab horizontally HT

Set horizontal tabs ESC D *nn*

Overall printing style

Select letter quality or draft ESC x *n*

Note:

The print quality and the speed cannot be changed even if you send the ESC x command.

Select typeface family ESC k *n*

Master select ESC ! *n*

Print size and character width

Select 10 cpi ESC P

Select 12 cpi ESC M

Turn proportional mode on/off ESC p 1/0

Select condensed mode SI

Select condensed mode ESC SI

Note:

Your printer substitutes 20-cpi and 16.66-cpi fonts for 12-cpi and 10-cpi fonts in condensed mode.

<i>Function</i>	<i>Command</i>
Cancel condensed mode	DC2
Select double-width mode (one line)	SO
Select double-width mode (one line)	ESC SO
Cancel double-width mode (one line)	DC4
Turn double-width mode on/off	ESC W 1/0
Turn double-height printing on/off	ESC w 1/0

Note

When combining ESC wand ESC W to produce double-width, double-height characters, your printer **increases** the vertical line weight, while an FX printer does not.

Also, if this command is set when the print position is at the first line of the page, the baseline does not change, while an FX printer lowers the baseline position.

font enhancement

Select emphasized mode	ESC E
Cancel emphasized mode	ESC F
Select double-strike mode	ESC G
Cancel double-strike mode	ESC H

Note:

The ESC E and ESC G commands produce identical **effects**, so you cannot obtain darker print by combining the two.

<i>Function</i>	<i>Command</i>
Select superscript/ subscript mode	ESC S 0/1
Cancel superscript/ subscript mode	ESC T 0/1
Select italic mode	ESC 4
Cancel italic mode	ESC 5
Turn underline mode on/off	ESC - 1/0

Word processing

Set intercharacter space	ESC SP <i>n</i>
Select character tables	ESC t <i>n</i>
Assign character tables	ESC (t <i>nn</i>
Select international character set	ESC R <i>n</i>
Printable code area expansion	ESC 6
Enable upper control codes	ESC 7

User-defined characters

Define user-defined characters	ESC & <i>nn</i>
-----------------------------------	-----------------

Note:

The appearance of characters defined using ESC & may differ slightly from that of an actual FX printer.

Copy ROM to RAM	ESC : 0 <i>n</i>
Select user-defined set	ESC % <i>n</i>
Printable code area expansion	ESC I <i>n</i>

Function *Command*

Graphics

Select graphics mode ESC * m n1 n2

Reassign graphics mode ESC ? s n

Epson GL/2 Emulation

All GL/2 commands in the LJ4 emulation shown earlier in this chapter are available in Epson GL/2 emulation. In addition, the commands listed below are available for the GL-like emulation in the GL/2 emulation.

Function *Command*

Designate standard character set CS

Designate alternate character set CA

PJL Mode

This section lists the available commands for the Printer Job Language (PJL). For more information on PJL, see the Hewlett-Packard *Printer Job Language Technical Reference Manual*.

Function *Command*

COMMENT @ PJL COMMENT <word> [<CR>] <LF>

DEFAULT @ PJL DEFAULT [LPARM] [<CR>] <LF>

DINQUIRE @ PJL DINQUIRE [LPARM] [<CR>] <LF>

ECHO @ PJL ECHO [Words] [<CR>] <LF>

ENTER @ PJL ENTER LANGUAGE = *** [<CR>] <LF>

EOJ @ PJL EOJ [NAME=***] [<CR>] <LF>

INFO @ PJL INFO read only variable [<CR>] <LF>

Function	Command
INITIALIZE	@ PjL INITIALIZE [<CR>]<LF>
INQUIRE	@ PjL INQUIRE [LPALM] variable [<CR>] <LF>
JOB	@ PjL JOB [NAME][START][END][<CR>] <LF>
OPMSG	@ PjL OFMSG DISPLAY = *** [<CR>] <LF>
RDYMSG	@ PjL RDYMSG DISPLAY = *** [<CR>] <LF>
RESET	@ PjL RESET [<CR>]<LF>
SET	@ PjL SET [LPARM] [<CR>] <LF>
STMSG	@ PjL STMSG DISPLAY = *** [<CR>]<LF>
UEL/SPjL	<ESC>%-12345X
USTATUS	@ PjL USTATUS variable = value [<CR>] <LF>
USTATUSOFF	@ PjL USTATUSOFF [<CR>] <LF>
PjL	@ EjL [<CR>] <LF>

You can also enter the Ejl emulation from the PjL emulation by specifying Ejl as the destination language of the ENTER command.

EJL Mode

This section lists the commands for Ejl (Epson Job Language). Ejl can perform the following operations in your printer

- Switch the printer emulation
- Transfer the printer's system information to the computer
- Enter the Printer Job Language (PjL)

Ejl can switch the printer emulation with a monodirectional interface, but a bidirectional interface is required for the computer to receive system information from the printer.

Function	command
Universal exit language/Start of E _J L	<ESC><SOH>
Enter printer emulation	LANGUAGE[<WS>]=[<WS>]LANGUAGE[<CR><LF>

Note:

For LANGUAGE, substitute one of the following: LJ4, ESCP2, FX, EPSONGL2, P_JL.

Comment	@E _J L<WS>COMMENT<WS><comment strings>[<CR>]<LF>
Inquire name	@E _J L<WS>INQUIRE<WS>NAME[<CR>]<LF>

Overview of the **E_JL** commands

E_JL commands must be sent immediately after the printer receives the universal exit command; otherwise the printer returns to its default printer emulation.

Every E_JL command starts with the string @E_JL, which must be in uppercase letters, although other commands can be in both uppercase and lowercase.

You must send the LF code at the end of an E_JL command; only an LF code terminates the E_JL command. If the E_JL command is not followed by an LF code, the printer does not recognize it as an E_JL command; it is then printed as a character string in the current printer emulation.

If the printer emulation you attempt to switch to is not available, the printer switches to the default printer emulation.

If you are in Epson GL/2 mode, you cannot exit with the universal exit command. You must switch emulations with SelecType.

Command summary for using EJL

<ESCxSOH> Universal exit **language/Start** of EJL

Format:

ASCII code: ESC SOH

Dacimal: 27 1

Hexadecimal: 1B 01

Description:

Exit current printer emulation and enter EJL mode

Note:

From Epson GL/2 mode, you cannot enter the EJL de with this command. You must change the printer emulation with SelecType.

@EJL ENTER LANGUAGE = <Language><LF> Enter printer emulation

Format:

ASCII code: @EJL<WS>ENTER<WS>LANGUAGE[<WS>]=[<WS>]
<Language>[<CR>]<LF>

Decimal: 64 69 74 76 32 69 78 84 69 82 32 76 65 78 71

85 65 71 69 [32] 61 [32] <ASCII strings> [13] 10

Hexadecimal 40 45 4A 4C 20 45 4E 54 45 52 20 4C 41

4E 47 55 41 47 45 [20] 3D [20] <ASCII strings> [0D] 0A

Language:

LJ4, ESCP2, FX, EPSONGL2, PJJ

Description:

Enter printer emulation from EJL

<WS> represents spaces (decimal 32) or a Horizontal Tab (HT) (decimal 9). Commands marked with brackets can be omitted.

@EJL COMMENT <comment strings> <LF> Comment

Format:

ASCII code: @EJL<WS>COMMENT<WS>

<comment strings>[<CR>]<LF>

Decimal: 64 69 74 76 32 67 79 77 77 69 78 84 32 <comment> [13] 10

Hexadecimal: 40 45 4A 4C 20 43 4F 4D 4D 45 4E 54 20 <command> [0D] 0A

@EJL INQUIRE NAME <LF> Inquire printer name

Format:

ASCII code: @EJL<WS>INQUIRE<WS>NAME[<CR>]<LF>

Decimal: 64 69 74 76 32 73 78 81 85 73 82 69 32 78 65 77 69 [13] 10

Hexadecimal: 40 45 4A 4C 20 49 4E 51 55 49 52 45 20 4E 41 4D 45 [0D] 0A

Description:

Inquires printer name. If you are using a bi-directional interface between the computer and the printer, your printer outputs the following answer strings:

@EJL ANSWER NAME = <Printer name> <CR> <LF>

<WS> represents spaces (decimal 32) or a Horizontal Tab (I-IT), (decimal 9). Commands marked with brackets can be omitted.

Appendix C

Option Installation

Installing the Options	C-2
Lower Paper Cassette	C-2
Installing the lower paper cassette	C-2
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Installing the Options

If you purchased your printer and options at the same time, first set up the printer and run the print test by following the instruction in the *Red This First* guide. Then install the options.



Caution:

Before installing an option, care fully read the manual that comes with the option.

Lower Paper Cassette

The optional lower paper cassette (C812301) holds up to 250 sheets of paper to supplement the standard tray's W-sheet capacity.

Installing the lower paper cassette

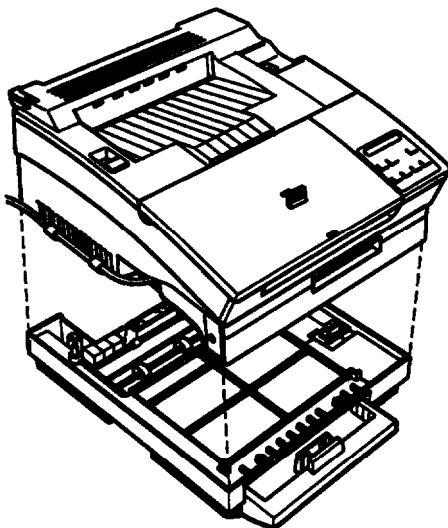
1. Turn off the printer. Remove any interface cables and unplug the printer's power cord from the electrical outlet and from the printer.
2. Remove the optional face-up tray, if it is installed.
3. Move the printer to one side. Place the lower cassette where your printer normally rests, keeping the paper cassette facing you.



Caution:

*when lowering the printer, be sure the interface **cable** is not pinched between the printer and the lower paper cassette.*

4. Lift the printer and align it over the cassette using the two alignment pins on the lower cassette as guides. Lower the printer so that the pins fit securely into the holes on the bottom of the printer as shown below.



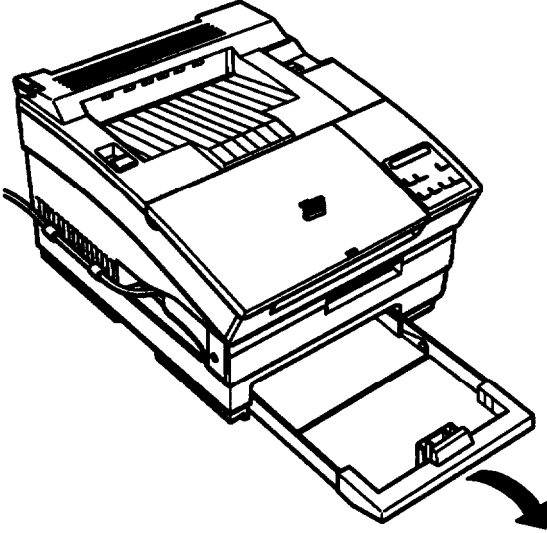
Note:

The printer is heavy, so you may need to have someone help you lift it.

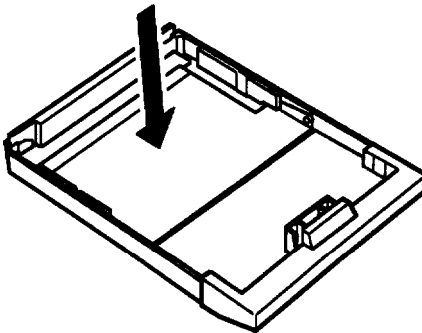
5. Reconnect the power cord and the interface cable or cables you removed and plug the power cord into an electrical outlet.
6. Turn on the printer.

loading paper into the lower paper cassette

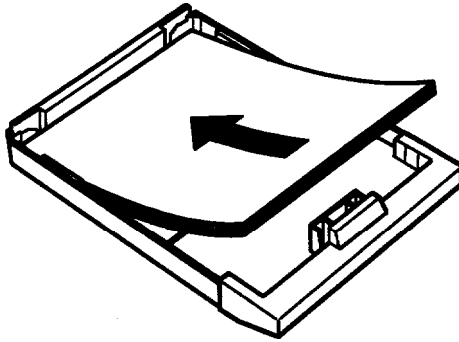
1. Remove the paper cassette from the printer by pulling it straight out. Then place it on a flat surface.



2. Take a stack of paper and fan it thoroughly,
3. Press down on the plate in the cassette until it clicks.



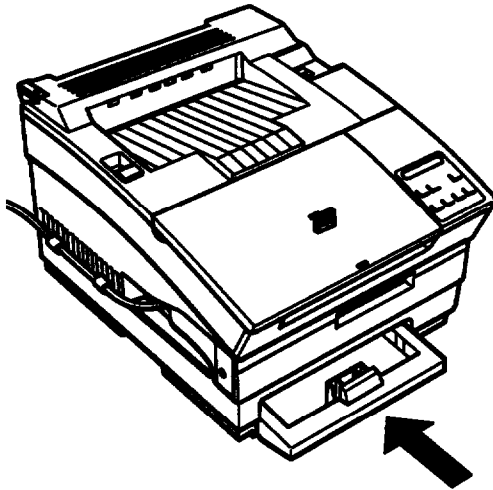
4. Insert the stack of paper face-up into the cassette with the corners of the paper beneath the two tabs at the back of the paper cassette.



Note:

Do not load paper above the marks on the cassette.

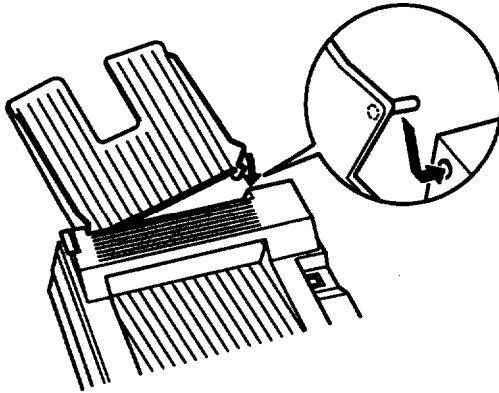
5. Re-insert the paper cassette and push it firmly into place.



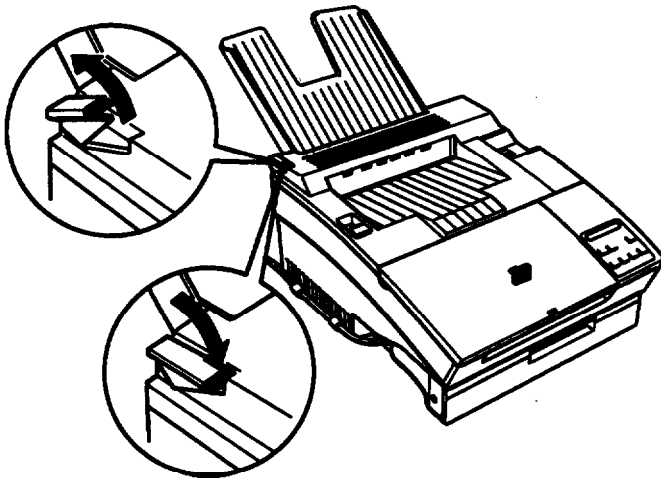
To feed paper from the lower paper cassette, change the paper source with your software or remove all paper from the standard paper tray. For information about changing the paper source, see Chapter 2, "Paper Handling."

Face-Up Output Tray

1. Hold the output tray tilted at a slight angle away from you. Then insert it into the back of the printer by placing the pins on the bottom side corners of the tray into the holes on each side of the paper ejection slot one at a time as shown below.



2. Set the paper path selector on the top left of the printer to the face-up position as shown.



When you want printed pages to feed face down on top of the printer, reset the paper path selector to the **face-down** position.

Optional Interface Card

To add a parallel or serial interface to your printer use one of the following:

32KB Serial Interface Card	C823071/C823081
32KB Parallel Interface Card	C82310*

To add a direct connection to an IBM[®] mini or mainframe system, use one of the following:

Twinax Interface Card	C82314*
Coax Interface Card	C82315*

The **twinax** and coax connectors each contain a parallel interface. Since the printer's built-in interfaces remain active, this gives you two parallel, one serial, and a **twinax** or coax interface. Print jobs can be sent to any **connection**, and the printer automatically switches between the **active** ports.

The **twinax** interface is compatible with the following IBM systems: AS-400, System 36, 5251 (model 12), System 34, System 38, and 5294.

When equipped with the Epson twinax interface, the printer can be used in place of the following IBM system printers: 4210,5224 (model 1 and 2), 5256 (model 1,2, and 3), 3218 (non IPDS), 4214 (model 2), 5225 (model 1, 2,3, and 4), and 5219 D01, D02.

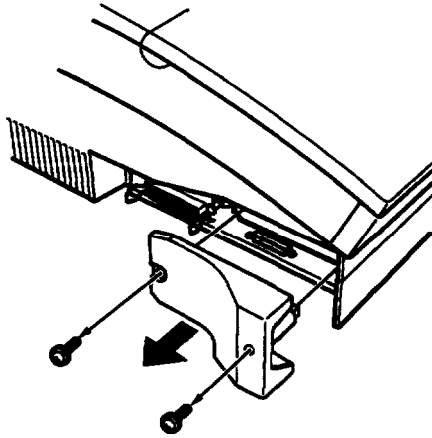
The coax interface allows the printer to be **connected** to the following IBM control units and mainframe systems: 3174, 3276, 4274, and 3270.

Installing an Interface board

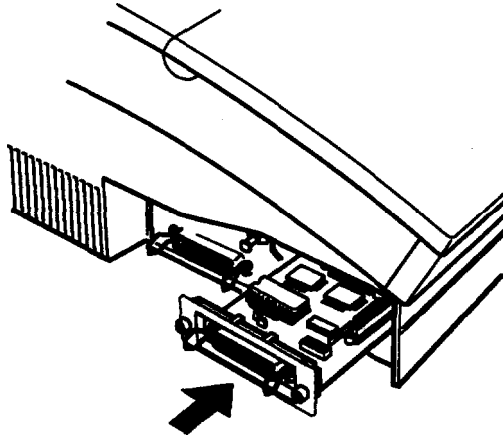
To install an optional interface, you need a cross-head screwdriver.

1. Turn off the printer. Remove any interface cables and unplug the power cord from both the electrical outlet and the back of the printer.
2. Turn the printer so that its left side is facing you.

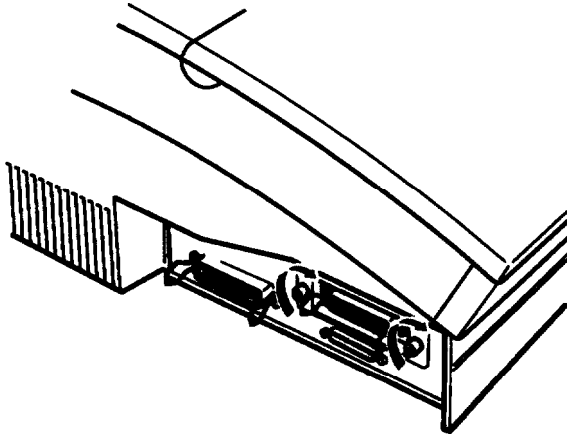
3. Remove the two screws that secure the interface cover and remove the cover.



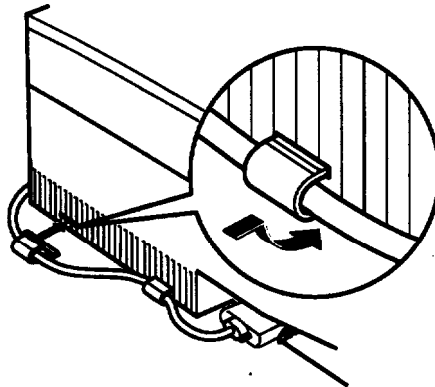
4. Slide the interface into the **grooves** in the interface slot shown below. Push it in **firmly** to make sure it connects to the printer's internal socket.



5. Secure the interface in the slot with the two screws attached to the interface.



6. Connect the proper interface cable to the interface and to your computer. Also, connect other interface cables if you are using more than one computer with your printer. See the Read This First guide for assistance.
7. Insert the interface cable or cables into the U-shaped part of one cable clip. Lift the left side of the printer up slightly. Then hook the short lip of the clip into the forward slot and push the bottom of the clip under the printer until it clicks in place. Repeat this procedure with the second clip and install it in the rear slot.



Note:

*Hook no more than two **cables** into one **cable** clip. Never put too much pressure on the **cables**.*

8. Turn the printer around so that the control panel faces you. Make sure the printer is turned off; then plug the power cord into the printer and into an electrical outlet.

Before you use the optional interface, you may need to change the printer emulation setting using SelecType. See Chapter 5 for more information about changing the emulation. If your optional interface is parallel and you want to use LJ4 emulation for the new interface, you do not need to change the setting.

You can verify whether the interface is correctly installed by printing a status sheet, which lists the printer's current settings. See Chapter 4 for information about printing the status sheet.

Memory Module

By installing one or two **Single In-Line Memory Modules (SIMMs)**, you can increase printer memory up to 64 MB. You may want to add additional memory if you are having difficulty printing complex, graphics-intensive pages or if you regularly use **numerous** downloaded fonts.

You can purchase **SIMMs** from various vendors. Be sure the **SIMMs** you purchase meet the following requirements:

- ❑ 72-pin type
- ❑ Capacity of 1,2,4,8,16, or 32 MB
- ❑ Access speed less than 70ns
- ❑ Dimensions within 108 mm (4.25 inches) x 36 mm (1.4 inches), with a diameter of 10 mm (.4 inches)

To install **SIMMs**, you must remove the controller board. Some of the electrical components that are exposed when you **remove** the controller board may be very hot if you have recently been using the printer. Do not touch any electrical components unless instructed to do so.

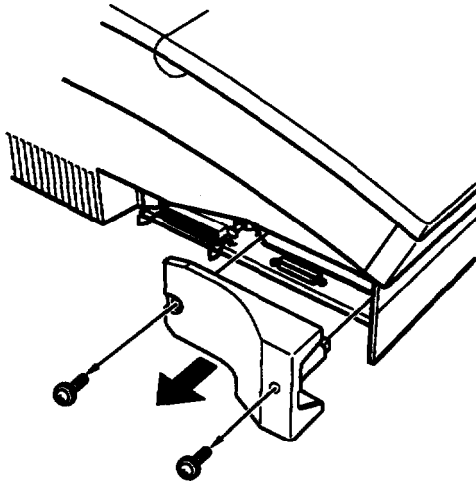
Removing the controller board



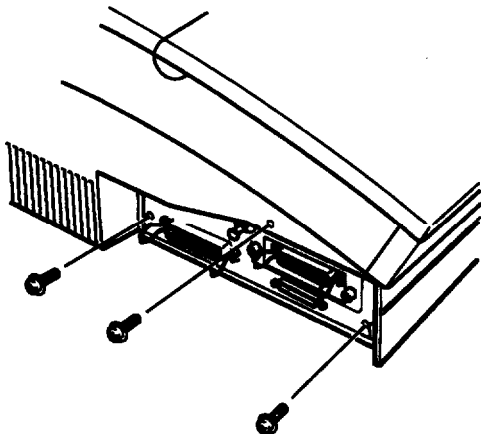
Warning:

High **voltages** are present **inside** the computer when the **power is on**. Do not attempt to remove the controller **board** unless the printer is turned off and the **power cord is unplugged**. Also, **try not** to touch the contacts on the board because many **of the components** can be damaged by static electricity.

1. Turn off the printer and unplug the power cable from the electrical outlet.
2. Remove the optional font cartridge and lower paper cassette, if installed.
3. Disconnect all interface cables from the interface connectors.
4. Turn the printer so that its left side is facing you.
5. Remove the two screws **securing** the interface card cover; **then** pull off the cover. Keep the screws handy so that you can use them later. If you have **already** installed an optional interface card, skip this step.

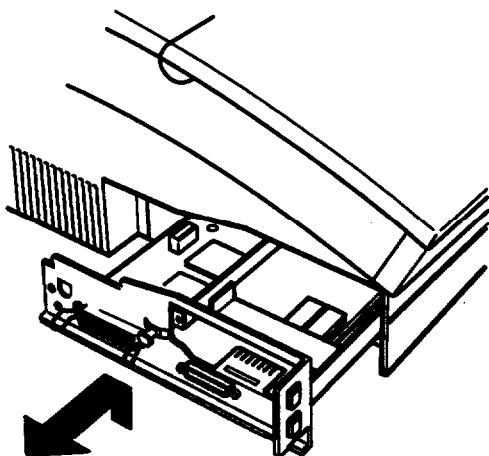


6. Remove the three silver screws that secure the metal bracket on the left side of the printer. Keep the **screws** handy so that you can use them later.



Caution: Before you remove the **controller board**, make sure that you remove **any optional cartridges**. Otherwise, you may **damage both the board and the cartridges**.

7. Pull the tab on the bottom of the bracket to remove the controller board, as shown below.

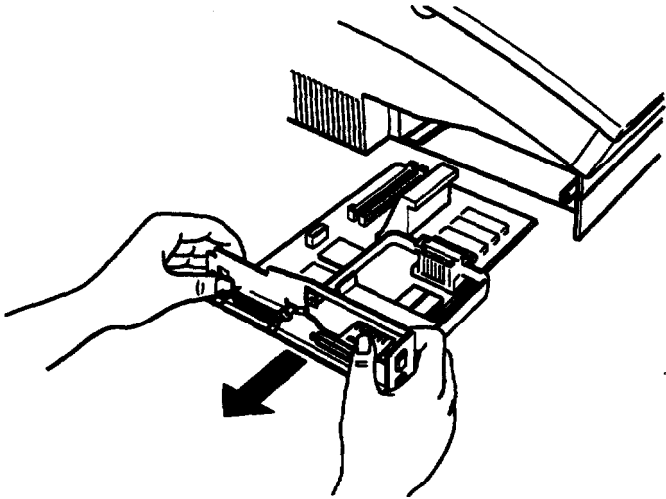




Warning:

Avoid touching the electrical components that are exposed after you remove the controller board. They may be very hot if the printer has been used recently.

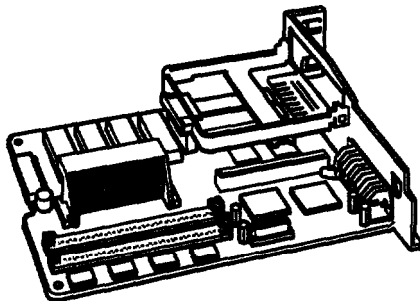
8. Grasp the board with both hands and pull it straight out of its slot.



9. Place the controller board on a clean, stable surface.

Installing the memory module

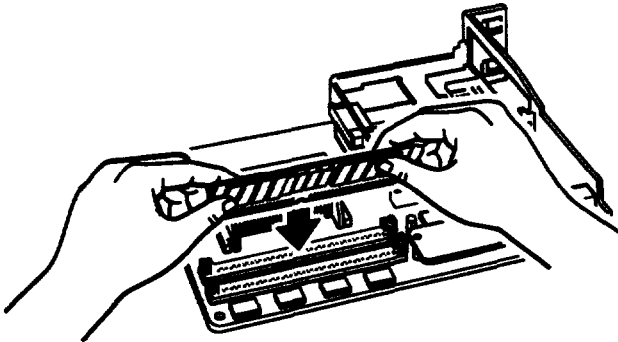
The two memory module slots are located at the left of the board when the board is facing you as shown below.



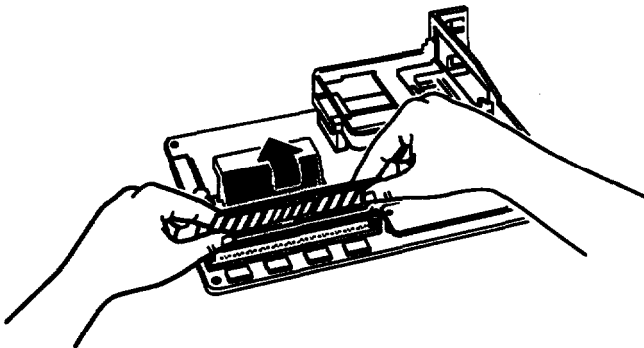
If you are installing one SIMM, use the back slot. If you are installing two SIMMs, use the back slot for the first SIMM, and the front slot for the second.

To install the SIMMs:

1. Hold the SIMM as shown below and insert it into the slot at an angle as shown below. Make sure the pin number of both the slot and the SIMM matches, showing 1 or 72.



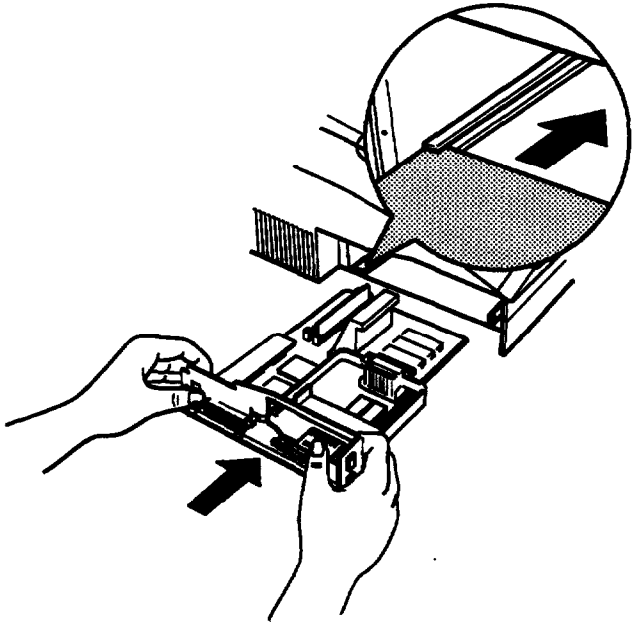
2. Press the SIMM in firmly, in the direction shown in the illustration, until it snaps into the notch of the connector. Do not apply too much force.



3. Reinstall the controller board as shown in the next section.

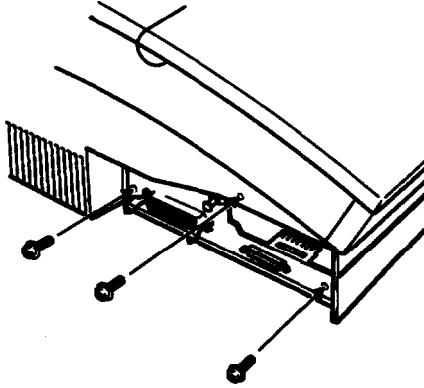
Reinserting the controller board

1. Hold the controller board level and fit its right edge into the right groove inside the board slot. Then gently fit its left edge into the left groove.



2. Slide the controller board into the printer until it locks in place. If the controller board does not fit smoothly into the printer, do not force it. Remove it and make **sure** the edges fit properly into the grooves inside the slot.

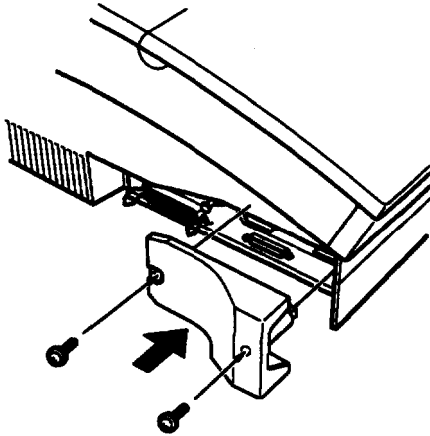
3. Secure the board with the three silver screws you removed earlier.



4. Attach the interface board cover with the two screws you removed earlier.

Note:

*Do not attach the **interface cover** if an **optional interface** is installed.*



5. **Reconnect** any interface cables you removed.

6. Insert the interface cable or cables into the U-shaped part of one cable clip. Lift the left side of the printer up slightly. Then hook the short lip of the clip into the forward slot and push the bottom of the clip under the printer until it clicks in place. Repeat this procedure with the second clip and insert it into the back slot.
7. Be **sure** the power is turned off; then plug the power cord into an electrical outlet.

Checking the *memory*

Turn on the printer. You should see the following:

- All indicator lights on the panel light briefly.
- The ROM Check message appears.
- The RAM Check message appears.

Make sure the printer displays the total amount of RAM that you now have installed, including the 2.0 MB of standard memory.

If an incorrect amount appears, turn off the printer and remove the controller board. Make sure you installed each SIMM in the correct direction and that it is fully seated. If the RAM Check message is still incorrect, contact your dealer or a qualified service person for assistance.

Font Cartridges

HP LaserJet compatible font cartridges are available from various suppliers. The following table lists the compatible cartridges for your printer. These cartridges can be used only in LJ4 emulation. For instruction on installing font cartridges, see "Adding More Fonts" in Chapter 3.

supplier	Products
Hewlett-Packard	92286A COURIER 1 92286B TMS PROPORTIONAL1 92286C INTERNATIONAL1 92286D PRESTIGE ELITE 92286E LETTER GOTHIC 92286F TMS PROPORTIONAL2 92286G LEGAL ELITE 92286H LEGAL COURIER 92286J MATH ELITE 92286K MATH TMS 92286L COURIER P&L 92286M PRESTIGE ELITE P&L 92286N LETTER GOTHIC P&L 92286P TMS RMN P&L 92286Q MEMO1 92286R PRESENTATIONS1 92286T TAX1 92286U FORMS Portrait 92286V FORMS Landscape 92286W3-of-9/OCR A 92286X EAN/UPC/OCR-B 92286Y PC COURIER 92286Z MICROSOFT1 92290S1 92290S2 92286PC ProCollection 92286IC International Collection C2055A#C01 GreatStart C2053A#C01 WordPerfect C2053A#C02 Microsoft C2053A#C03 Polished Worksheets C2053A#C04 Persuasive Presentations C2053A#C05 Forms Etc. C2053A#C06 Bar Codes & More C2053A#C07 Text Equations C2053A#C08 Global Text C2053A#C09 Pretty Faces

Supplier	Products
Hewlett-Packard (scalable)	2050b#C80/C90 2050c#C80/C90 NordPerfect
Anacom General Corp.	AlfaJet MX-1 Maxi-One Cartridge AlfaJet PC Maxi-Pro Cartridge
Computer Peripherals, Inc.	JetFont SuperSet JetFont 12/30 JetFont 4-in-1 JetFont SuperSet International JetFont 425-in-One SuperSet Plus
Everex Computer Products LTD.	HardFont Cartridge B HardFont Cartridge F HardFont Cartridge T HardFont Cartridge Z HardFont Cartridge LGL HardFont Cartridge SST HardFont Cartridge BST HardFont Cartridge BST HardFont Cartridge All-in-1 HardFont Cartridge A-to-Z
IQ Engineering	Super Cartridge 1 Super Cartridge 2 Super Cartridge 2L Super Cartridge 2LC Super Cartridge 2WP Super Cartridge 2XP Super Cartridge 2LS Series II Package
IQ Engineering (scalable)	Super Cartridge 3 Professional Edition Super Cartridge 3 Professional Edition Plus Super Cartridge 3 Creative Collection
Pacific Data Products	25 Cartridge in One Original Version 25 Cartridge in One 172 25 in One! III Headlines in a Cartridge
Pacific Data Products (scalable)	Pacific Outlines I Pacific Outlines II COMPLETE FONT LIBRARY CARTRIDGE
OTC	3etter Yet Bizzillions

Supplier	<i>Products</i>
UDP Data Products, Inc ,	DT1-TMS RMN DT2 - HELV DT4-TMS RMN/HELV H-65 65-in-One I-65 International 65-in-One PRO 65 86-IC 25 Plus Turbo 25 Super Times T&F Tax and Finance WP Plus CI MS Plus C2 Spreadsheets C3 Presentation Plus C4 Forms C5 Bar Codes C5 Equations C7 Global C8
Intercon Associates, Inc.	PHONT + PRO EP
Bitstream Inc.	CTG-A001 TYPE CITY STARTER PACK EU ADD-ON CARD MOD-A001 CENTERAL PARK ADD-ON CARD MOD-A002 SKYSCRAPER ADD-ON CARD MOD A003 SOHIO ADD-ON CARD MOD-A004 CENTURY SCHOOLBOOK ADD-ON CARD MOD-A005 HUMANIST 521 ADD-ON CARD MOD-A006 BITSTREAM CHARTER ADD-ON CARD MOD-A007 DUTCH 801 ADD-ON CARD MOD-A008 HEADLINES II ADD-ON CARD

Glossary

ASCII

American Standard Code for Information Interchange. A standardized way of assigning codes to characters and control codes. The system is widely used by manufacturers of computers, printers, and software.

auto line feed

A Selectype feature in which each carriage return code (CR) is automatically accompanied by a line feed (LF) code.

baud rate

A measure of the speed of data transmission over the serial interface.

bitmapfont

The dot-by-dot representation of a font. Bitmap fonts are displayed on computer screens and printed on dot matrix printers. See outline font.

buffer

See *memory*.

character set

A collection of letters, numbers, and symbols used in a particular language.

characters per inch (cpi)

A measure of the size of fixed-width text characters.

control codes

Special codes used to control printer functions such as sounding the beeper and performing a carriage return or line feed.

cpi

See *characters per inch*.

default

A value or setting that takes effect when the printer is turned on, reset, or **initialized**.

download

To transfer information from the computer to the printer.

downloaded font

A font that is loaded into the printer's memory from an outside source, such as a computer. Also called soft font.

dpi

Dots per inch. This is a measure of printer resolution.

driver

The part of a software program that converts commands from the program into commands used by the printer. Also known as the printer driver.

drum

The part of the printer mechanism where the image is formed and transferred to the paper.

emulation

See *printer emulation*.

ESC (escape) code

A special control code used to begin most printer commands.

ESC/P 2

An abbreviation of the latest version of the Epson Standard Code for printers. This system of printer commands lets you perform software control of your printer from your computer. It is standard for all Epson printers and supported by most software programs for personal computers.

fixed-width font

A font whose characters are allotted the same amount of horizontal space, no matter the width of the character. Thus the uppercase M receives the same amount of space as the letter l.

font

A set of characters and symbols that share a *common* typographic design and style.

font cartridge

An optional cartridge that contains additional fonts.

font family

The collection of all sizes and styles of a font.

halftone

A grayscale image that is composed of small dots. The dots can be close together to create black or more widely spaced to create gray or white areas in the image. Newspaper photographs are common examples of halftones.

hex dump mode

A printing mode that can be used to print out the exact codes reaching the printer. The mode can be used by experienced users as a troubleshooting tool.

imaging cartridge

The consumable part of the printer that contains a photosensitive print drum and the toner supply.

initialization

The act of returning the printer to its defaults (fixed set of conditions).

interface

The connection between the printer and the computer, A parallel interface transmits data one character or code at a time, and a serial interface transmits data one bit at a time.

landscape

Printing that is oriented sideways on the page. This orientation gives you a page that is wider than it is high and is useful for printing spreadsheets.

memory

The part of the printer's electronic system that is used to store information. Some information is fixed and is used to control how the printer operates. Information that is sent to the printer from the computer (such as downloaded fonts) is stored temporarily.

offline

The printer state during which it cannot communicate with the computer. Some printer functions, such as changing the SelecType settings, require the printer to be off line.

online

The printer state during which the printer can communicate with the computer.

orientation

Refers to the direction in which characters are printed on a page. This direction is either portrait with the text printed across the width of the page, or landscape with the text printed across the length of the page.

outline font

A font whose outline is described mathematically, allowing it to be rendered smoothly at any size.

Parity

A method of checking the reliability of serial data transmission between the computer and printer.

PCL 5e

The command language built into the Hewlett-Packard LaserJet 4.

pitch

A measure of the number of characters per inch (cpi) for fixed-width fonts.

point size

The height of a particular font as measured from the top of the tallest character to the bottom of the lowest. A point is a typographic unit of measure equivalent to 1/72 of an inch.

portrait

Printing that is oriented upright on the page (as opposed to landscape, in which printing is oriented sideways on the page). This is the standard orientation for printing letters or documents.

printer driver

see driver.

printer emulation

A set of operating commands that determines how data sent from the computer is interpreted and acted upon. printer emulations replicate existing printers, such as the HP LaserJet 4 or the Epson LQ and FX dot matrix printers.

proportional font

A font whose characters have varying amounts of horizontal space depending on the width of the character. Thus the uppercase M takes up **more** horizontal space than the lowercase l.

reset

To refresh the printer's memory and erase the current print jobs.

resident font

A font that is stored permanently in the printer's memory.

resolution

A measure of the fineness and clarity of images produced by the printer or monitor. printer resolution is measured in dots per inch. Monitor resolution is measured in pixels.

RI Tech

Resolution Improvement Technology. A feature that smooths the jagged edges of printed lines or shapes.

sans serif font

A font lacking serifs.

scalable font

See *outline font*.

SelectType

A feature of the printer that allows you to set printer values and control most of the printer's functions from the front panel.

Serif

The small decorative strokes that come off the main line of a character.

status sheet

A report that lists the SelectType settings and other printer information.

symbol set

A collection of symbols and special characters. Symbols are assigned to specific codes in a character table.

TrueType

An outline font format that was developed jointly by Apple Computer and Microsoft Corporation. TrueType fonts are outline fonts that can be easily resized for screen display or for printing.

index

This index contains entries for this manual as well as for the *Read This First (setup)* guide. Page numbers from the *Read This First guide* are preceded with RTF (e.g., RTF-9).

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