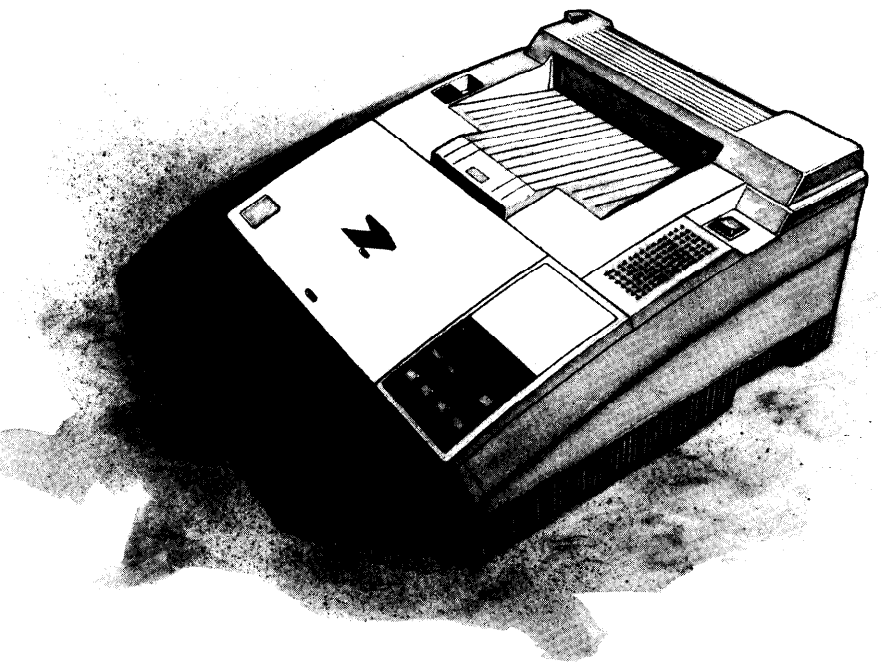
EPSON® ActionLaser™ 1000/1500



Reference Guide

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 FCC Certification of this device and may cause interference levels which exceed the limits 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 present 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.

EPSON® ActionLaser™
1000/1500

Reference Guide

Contents

Getting Started

Chapter 1 ***Controlling Your Printer***

Chapter 2 **Paper Handling**

Chapter 3 **Troubleshooting**

Chapter **4 SelecType**

Chapter 5 Options

Appendix A ***Technical Specifications***

Appendix ***B*** ***HP Emulation Mode***

Appendix ***C*** ***LQ and FX Emulation Modes***

Getting Started

The ActionLaser 1000 and 1500 printers combine 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 Setup *and Maintenance* 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 have your printer's serial number and a status sheet printout handy. See Chapter 4 for information on printing a status sheet.

Epson also provides the following support services through Epson Connection 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 our current and new products
- ❑ Sales of supplies, parts, documentation, and accessories for your Epson product
- ❑ Customer Relations
- ❑ User group locations.

Safety Information

Laser Safety

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

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

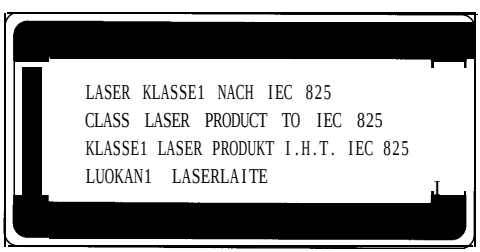
CDRH Regulations

The Center 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 I, subchapter J.
SEIKO EPSON CORP.
Hirooka Off ice
80 Hirooka, Shiojiri-shi, Nagano-ken, 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 Regulation

Max. Radiation Power 5(mW)

Wave Length 760-810(nm)

This is a Class IIIb Laser Diode Assay that has an invisible laser beam. The print head unit is NOT A FIELD SERVICE ITEM. Therefore, the print 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

These printers use 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.

- ❑ Do not 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.
- ❑ High voltages are present inside the printer when the power is turned on.
- ❑ Protect the light-sensitive imaging cartridge from exposure to light. Avoid exposing the imaging cartridge to room light for any longer than necessary. Overexposing it may cause abnormally dark or light areas on the printed page and may reduce the service life of the unit.
- ❑ If you must expose the imaging cartridge either by taking it out of the printer or by leaving the printer cover open, cover the unit with a soft cloth or sheet of paper.
- ❑ Avoid pressing on the top of the imaging cartridge. Pressing directly on the cartridge may cause toner to spill into the printer. If the non-printed side of your paper is dirty indicating a spill, see Chapter 3, "Troubleshooting."
- ❑ Never force the printer's components into place. Although the printer is designed to be sturdy, rough handling can damage it.

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 because it may fall, causing serious damage.

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, a plug having a third (grounding) pin. 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* the *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.

Chapter 1

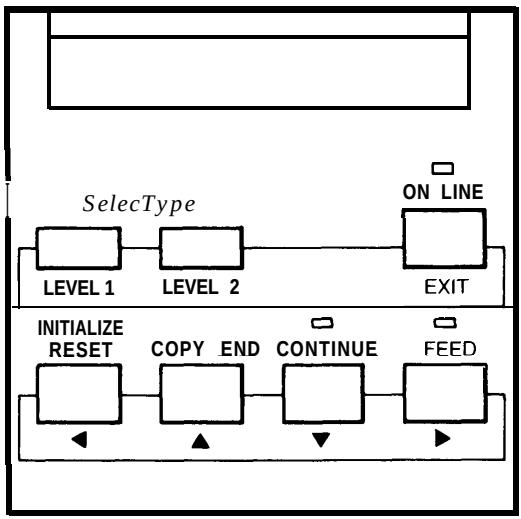
Controlling Your Printer

The Control Panel

The printer control panel gives you easy control over most common printer operations. The panel consists of a liquid crystal display (LCD), indicator lights, and buttons.

Display (LCD)

The display shows the printer's status, such as **PRINTING,** and available options.



Indicator lights

ON LINE	On when the printer is on line, indicating that the printer can receive and print data.
CONTINUE	Flashes when an error is detected or a maintenance procedure is needed. The error message appears on the display at the same time.
FEED	On when data is received and stored in the printer's buffer without being printed out. Rapid flashing indicates the printer is receiving data from the computer.

Buttons

The top three buttons on the control panel function as follows:

SelecType

LEVEL 1	Enters SelecType Level 1. See "SelecType," Chapter 4.
LEVEL 2	Enters SelecType Level 2. See "SelecType," Chapter 4.
ON LINE/EXIT	Switches the printer between on line and off line status. This switch is disabled when the printer is in SelecType mode.
	Exits SelecType mode.

You use the four buttons in the bottom row of the control panel to select printer settings and functions.

INITIALIZE/RESET

RESET-When you hold down this button until RESET appears on the display, the printer finishes printing the current page and then stops. The remaining data is discarded, and some SelecType Level 1 settings return to their previously saved values. See Chapter 4, "SelecType."

When you hold down this button while you turn on the printer, **FACTORY RESET** appears on the display and all the SelecType settings return to the factory settings.

INITIALIZE-When you hold down this button until **INITIALIZE** appears (after RESET), received print data clears and SelecType Level 1 and 2 settings return to the power-on settings.

COPY END

COPY END-Cancels the remaining copies when multiple-copy printing is selected and the printer is off line.

CONTINUE

CONTINUE-If the CONTINUE light is flashing, read the corresponding error or status message on the display and correct the problem as described in Chapter 3. Then press this button to resume printing.

FEED

When the printer is off line and the FEED light is lit, press this button to print out data in the printer's memory.

Tip: Other common uses for these buttons are as follows:

- ❑ ON LINE — Press to set the printer on line after you supply paper. (The printer is off line when the paper is out.)
- ❑ RESET — Press to stop printing or to clear remaining data.
- ❑ 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.)

Other control panel features

- Data dump — Hold down the LEVEL 2 button while you turn on the printer to enter data dump (hex dump) mode. This feature helps you find the cause of communication problems between the computer and printer. For more information, see the section on data dump in Chapter 3, "Troubleshooting."
- ▲ CH (:P:S:O) — See "Sharing Your Printer" later in this chapter.
- ▼ IES (PS&XX) — See "Intelligent Emulation Switch" later in this chapter.

Using the Printer with Software

A portion of the application software called the printer driver translates the margins, fonts, and all the other selections you have entered into control codes that the printer understands. You load the software's printer driver when you select a printer from the software menu.

Choosing the correct printer driver from the software menu helps to ensure that the application sends the correct codes to the printer. The ActionLaser 1000 emulates an HP LaserJet IIIP® and the ActionLaser 1500 emulates an HP LaserJet III,@ so you can access the most printer features from your software by choosing that printer driver or the selection closest to it.

Because the printer driver automatically places control codes in the data for your document when it sends the file to the printer, software settings usually override the settings you made at the control panel. So, the best way to enter most of your printer selections is through the software. Some software packages also let you embed your own printer control codes into the document.

Note:
Your software's manual and technical support representative are your *best sources for information on installing* your *software. Printer drivers are included with* your *software package. Many manufacturers provide technical support phone assistance for helping you install* your *printer drivers.*

This section provides quick instructions for using your printer with some software you may already have installed in your computer. The descriptions cover a number of the leading software packages. If you need further details or if you are using a package not described here, see the manual supplied with your software.

If you have documents or software that require a printer emulation other than HP LaserJet,@ see "Using Printer Emulations" later in this chapter.

Note:
The descriptions below assume that you have already installed your *software.*

Lotus® 1-2-9 Release 3.1

1. At the C:\123R3> prompt (or from your Lotus directory), type install and press Enter.
2. Highlight "Change Selected Equipment" and press Enter.
3. Highlight "Modify Current DCF" and press Enter.
4. Highlight "Change Selected Printer" and press Enter.
5. Choose HP and press Enter.
6. Scroll down, and select HP LaserJet IIP.*
7. Select the name of the cartridge you have installed, or choose "No Cartridge."
8. The program may ask you to insert Disk 4 of your original diskettes so that it can copy files. Follow the instructions on the screen.
9. Return to the main menu.
10. Select "End Installation Program."
11. When the screen asks if you want to save changes, select Yes.
12. Use the DCF name displayed, or type in another one.
13. When the screen says "INSTALLATION SUCCESSFUL," press Enter.
14. The next screen says "GENERATING FONTS." Choose the range of fonts you want to generate, and press Enter.
15. After the fonts are generated successfully, press any key.

* HP LaserJet III for the ActionLaser 1500.

Microsoft® Word 5.5

1. Run Setup again to install the driver for your printer.
2. Select "Install printer drivers" when Word gives you that option.
3. Scroll down to select HP LaserJet II* and press Enter.
4. Select the cartridge you have installed, if applicable.
5. Select the port you are using (most commonly LPT1: if you are using the parallel port or COM1: if you are using the serial port).
6. Follow the instructions in the Setup program to copy the driver files.

Windows™ 3.0 or 3.1

1. Click the mouse on the Control Panel icon.
2. Click on the Printers icon.
3. Select the Add Printer button on the right-hand side of the window.
4. Scroll down to HP LaserJet II.*
5. Highlight HP LaserJet II* with the mouse.
6. Select Install.
7. Windows displays the message "Insert Windows Setup Disk 5 or a disk with the updated HPPCL.DRV (HPPCL5A.DRV for ActionLaser 1500) in A:\." Insert the disk and select OK.

* HP LaserJet III for the ActionLaser 1500.

8. In the Installed Printers window, "HP LaserJet II" on None, Inactive" should be highlighted. Select Configure.

9. Select the port you are using (most commonly LPT1: if you are using the parallel port or COM1 : if you are using the serial port).

10. Select Setup.

11. Match the memory on the screen to the memory in your printer.

12. Select the graphics resolution you want to use.

13. Match the paper tray and cartridges to what you have installed in the printer.

14. When everything is the way you want it, select OK.

15. In the Status box, select Active.

16. Select OK.

17. Close the Control Panel window.

WordPerfect® 5.1

1. Press Shift+F7.

2. Press S.

3. Press 2.

4. Press the down arrow key to scroll to HP LaserJet II.*

5. Press 1.

6. Press Enter.

* HP LaserJet III for the ActionLaser 1500.

7. Press 1.

8 Press Enter.

WordStar® 6.0

1. At the C:\WS6> prompt (or from your WordStar directory), type prchange and press Enter.

2. Type a name to identify the printer definition file you are creating. For example, type HPLJIIP* and press Enter.

3. A menu lets you choose the type of printer you are installing. Select HP LaserJets.

4. The program shows a list of its available HP LaserJet printer drivers. Select HP LaserJet II.*

5. The next menu lets you set up the printer; you can add fonts, create a batch file for downloading to the printer, select sheet feeder, and choose your printer port. Follow the instructions on the screen to define your printer.

   Be sure the selection for the port you are using is correct (most commonly LPT1: if you are using the parallel port or COM1: if you are using the serial port).

6. When the printer is defined correctly, select "Return to Installed Printer Menu."

7. WordStar asks whether this is to be your default printer. For ease of use, make the printer your default.

* HP LaserJet III for the ActionLaser 1500.

Selecting fonts

Lotus 1-2-3 Release 3.1

1. From the Wysiwyg menu, press F.
2. Press F again.
3. The program lists 8 fonts. To select one of those fonts, type a number from 1 to 8.
4. If you want to use a font other than the 8 listed, press R.
5. After you have pressed R, Lotus asks which of the fonts in the list you want to replace. Press a number from 1 to 8.
6. Highlight the name of the new typestyle you want and press Enter.
7. Enter a point size and press Enter.

Microsoff Word 5.5

1. Highlight the characters you want to select for this font.
2. Press Alt+t.
3. Press c.
4. Use the arrow keys to select the font you want to use and press Enter.

WordPerfect 5.1

1. Press Ctrl+F8.
2. Press 4.
3. Highlight the font you want to use.
4. Press 1.

WordStar 6.0

1. Select "Choose font" from the Style menu.
2. WordStar displays a list of available fonts. (Bitmap fonts are followed by a point size; scalable fonts are followed by an ellipsis.)
3. Highlight the font you want and press Enter.
4. If you have selected a scalable font, WordStar prompts you to enter a point size.

Entering printer commands

(Appendix B provides a complete list of the control codes for this printer. This section describes how to enter those codes in your software.)

Lotus 1-2-3 Release 3.1

Lotus allows you to enter printer control codes as a setup string in an area of the Print menu. To enter a setup string, follow the steps below.

1. In the non-Wysiwyg menu, select Print.
2. Select Printer from the next menu.

3. Select Options.

4. Select Setup.

5. The Lotus prompt says "Enter setup string:." Begin the string with a backslash, and type the decimal values corresponding to the command.

   For example, to specify landscape orientation, you type the following:

   \027\038\108\049\079

Microsoff Word 5.5

The Word software package lets you modify Word's printer driver file, a file with the extension .PRD, to create your own driver file. By modifying the printer driver file, you can perform certain global functions: for example, remapping the character table so that whenever you enter & on the keyboard, the printer prints ®.

Word's *Printer Information for Microsoft Word* manual describes this procedure in detail. Briefly, to modify the .PRD file, you run a Word program called MAKEPRD. (The file MAKEPRD.EXE must be in your directory.) The MAKEPRD program converts the .PRD file into an ASCII text file, and you can type the new printer control commands as text in this file. When the text version of your .PRD file is modified the way you want it, you run MAKEPRD again to convert the file back into a printer driver file.

Within the Microsoft Word program itself, you also can key in command strings as text and send them to the printer as long as the command string is not interrupted with Word formatting codes. For example, you could type the following line into a text-only file and send it to the printer with Microsoft Word:

ESC*c10A ESC*c1200B ESC*c0P

(Type the ESC codes by turning NUM LOCK on, holding down the Alt key, and entering the number 27 on the keypad. The spaces in the command line above are to separate the codes visually. In your typing, do not leave spaces before the escape codes.)

The printed page should contain a vertical rule 10 dots wide and 1200 dots long.

WordPerfect 5.1

1. Press Shift+F8.
2. Press 4.
3. Press 6.
4. Press 2.
5. Press 1.
6. Type the command. (Use less-than and greater-than signs to enclose the decimal numbers in the command.)

   For example, to draw a vertical rule 10 dots wide and 1200 dots long, type:

   <27>*c10A<27>*c1200B<27>*c0P
7. Press Enter four times.
8. You can press Alt+F3 to verify that your printer command is embedded in the text.

WordStar 6.0

1. Type ^P!.

2. WordStar prompts you for the charactersyou want to send to the printer. Type the command.

3. The program prompts you for the characters you want to display on the screen. Type a descriptive name for your command.

Printing foreign of other characters

The printer is capable of printing many characters other than those shown on your keyboard. Most software packages have a method to let you enter a number corresponding to the character you want to print so that you can print that character.

You can find the number you need to enter by looking at the symbol set tables in this manual. (See Available Fonts and Symbol Sets in Appendix B.) Many software packages expect you to type a decimal number corresponding to the character. There is a hexadecimal to decimal conversion listing in "Printer command arranged by topic" in Appendix B of this manual.

Note that the same numeric code prints different characters depending on the symbol set the printer is currently using. For example, the yen sign corresponds to decimal 188 (hexadecimal BC) in the Roman-8 symbol set. In the IBM-US character set, the yen sign is decimal 157 (hexadecimal 9D).

Lotus 1-2-3 Release 3.1

Hold down the Alt key and type the decimal number on the numeric keypad that corresponds to the character in the symbol set.

For example, if your printer is using the Roman-8 symbol set and you want to enter the yen sign into your spreadsheet, hold down the Alt key and press 188.

Microsoft Word 5.5

1. Turn Num Lock on.

2. Hold down the Alt key and type the decimal number on the numeric keypad that corresponds to the character in the symbol set.

   For example, if your printer is using the Roman-8 symbol set and you want to enter the yen sign, hold down the Alt key and press 188.

WordPerfect 5.1

Hold down the Alt key and type the decimal number on the numeric keypad that corresponds to the character in the symbol set.

For example, if your printer is using the Roman-8 symbol set and you want to enter the yen sign, hold down the Alt key and press 188.

WordStar 6.0

If you want to print a character from the IBM extended character set, follow the steps below:

1. Press ^P and then press 0.
2. WordStar displays a matrix containing all the characters in the set that are not available on your keyboard.
3. Type the number corresponding to the character you want, and press Enter.
4. Press Esc to exit the menu.

To print other characters:

Hold down the Alt key and type the decimal number on the numeric keypad that corresponds to the character in the symbol set.

For example, if your printer is using the Roman-8 symbol set and you want to enter the yen sign, hold down the Alt key and press 188.

Enhancing Print Quality

If your printing is slightly too light or too dark or if it is not quite as crisp as it should be, first make sure you are using smooth, high-quality paper. (See Chapter 2, “Paper Handling,” for more details on paper.)

If your paper is not the problem, try adjusting the print density using SelecType Level 2. Additionally, if you have an ActionLaser 1500 printer, try changing the Resolution Improvement Technology setting described later in this section.

For serious print quality problems, such as black or white streaks, see the print quality section in Chapter 3, "Troubleshooting."

Adjusting print density

If your test prints are too light or too dark, adjust print density as follows:

1. Press the LEVEL 2 button.

2. Press ▼ until the following appears:

```
♦ DENSITY     L*** D ▶
```

3. Press ▶ once and then ▼ to select a density setting from 1 to 5 asterisks. The more asterisks there are the darker the print.

4. Press ▶ to set the new density setting.

5. Press the EXIT button to exit SelecType.

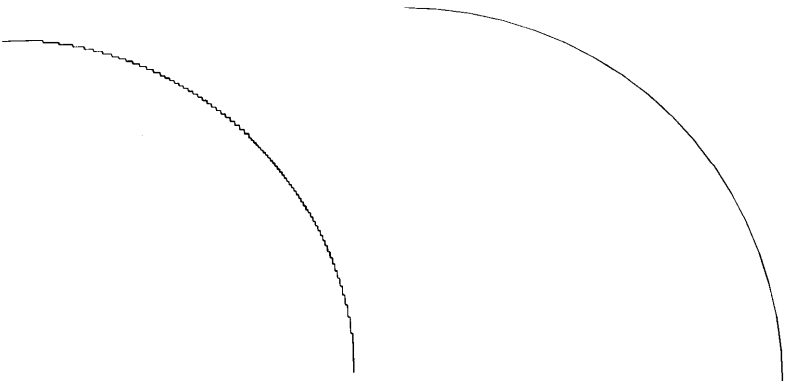
6. Reprint the first page of your document to see if the density is satisfactory. If the density needs further adjustment, repeat steps 1 through 5.

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

Resolution Improvement Technology

If you have an ActionLaser 1500 printer, read this section on enhancing print quality. Resolution Improvement Technology (RITech) is Epson's new printer technology that produces smoother and crisper lines, text, and graphics.

The illustration below shows an enlarged sample of a curve printed with conventional laser technology and the same curve printed with RITech.



RITech off

RITech on

The RITech setting

The factory setting for RITech gives the best quality text and graphics for nearly all purposes. It does not require you to set or adjust anything. Occasionally, however, adjusting the RITech setting with SelecType may further improve the print quality.

For example, you may want to change the setting after you replace an imaging cartridge or if you notice that your printing is not as smooth and crisp as it should be.

To guide you in choosing the optimum RITech setting, the SelecType RITech option prints a check pattern.

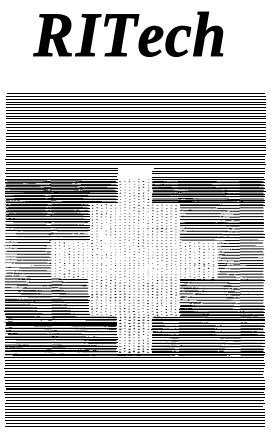
Checking the RITech setting

1. Enter SelecType Level 2 by pressing the LEVEL 2 button.

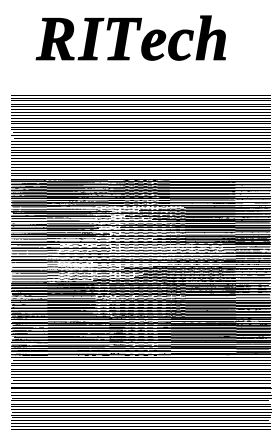
2. Press ▼ until RITech and the current RITech setting appear on the display.

3. Press ▶ three times. The printer prints the check pattern.

4. Look at your check pattern to see if your current setting is correct. 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.



Incorrect



Correct

Note:
RITech may not improve graphics that include gray shading or a screen pattern. If you are printing such graphics, you may want to turn RITech off.

After you print a RITech pattern, SelecType Level returns to the default settings and the printer clears its memory including any downloaded font data.

Changing the RITech setting

You can select LIGHT, MEDIUM (the factory setting), HEAVY, or OFF.

RITech is in effect when you select LIGHT, MEDIUM, or HEAVY. Changing the setting to OFF turns off the RITech feature.

If your check pattern is too heavy, change the setting to LIGHT; if it is too light, change the setting to HEAVY; if you are printing gray shading or screen patterns, change the setting to OFF.

To change your RITech setting, follow these steps:

1. Enter SelecType Level 2 by pressing the LEVEL 2 button.
2. Press ▼ until RITech appears on the display.
3. Press ▶ once and then press ▼ until your desired setting (LIGHT, MEDIUM, HEAVY, or OFF) appears on the display.
4. Press ▶ twice to set the new setting and print a new check pattern using the new RITech setting.
5. Look at the new check pattern to see if it is improved. If you wish to save the new setting, press the EXIT button to exit SelecType.

If the pattern still needs to be improved, you probably need to change the print density setting. For a darker (HEAVY) RITech setting, make the print density lighter and vice versa. See "Adjusting print density" earlier in this chapter for instructions.

Note:
Do not change the pint density unless it is necessary. Doing so affects all text and graphics, so check the new setting by printing several pages.

Sharing Your Printer

You can connect your printer to more than one computer at the same time. Simply connect interface cables from the computers to the interfaces on your printer.

Your printer comes with a built-in parallel interface (Centronics® compatible) and a slot for an optional interface. The ActionLaser 1500 also has a built-in serial (RS-232C) interface. If you want to install an optional interface, see Chapter 5, "Options," for instructions.

Note:
If you use the ActionLaser 1500's built-in serial interface, you will need to configure it to match your computer. See the INTERFACE option in Chapter 4, "SelecType" for information on settings.

AUTOSENSE setting

By default, your printer uses AUTOSENSE, a SelecType setting that automatically detects which interface channel (parallel, serial, or optional) is receiving data from the computer and allocates all of the printer's available memory to that channel.

In the unlikely event that you have problems with files from different computers interfering with each other, you may wish to try the INDIVIDUAL setting which allocates a separate area of memory for each channel. For information on how to use the INDIVIDUAL setting, see the USER option in Chapter 4, "SelecType."

By pressing ▲ when you are sharing the printer with two or three interface channels, you can manually switch between channels P, S, or O as applicable to your printer.

Using Printer Emulations

A printer emulation is a set of operating commands that determines how data sent from your computer is interpreted and acted upon by the printer. Your printer has several resident emulations:

- ❑ HP IIP LaserJet (ActionLaser 1000)
- ❑ HP III LaserJet (ActionLaser 1500)
- ❑ Epson LQ
- ❑ Epson FX
- ❑ Epson GL/2 (ActionLaser 1500).

The HP LaserJet IIP emulation is the default setting for the ActionLaser 1000. HP LaserJet III emulation is the default setting for the ActionLaser 1500. See Appendixes B and C for detailed information on all of your printer's emulations.

In most cases you will not need to change the default setting. However, there are four reasons why you may need to use a printer emulation other than the default setting:

- ❑ If you need to print documents already formatted for a dot matrix printer.
- ❑ If you need to use application programs that do not support an HP LaserJet printer.
- ❑ If you are using the optional PostScript identity card.
- ❑ If you are using Epson GL/2 mode with the ActionLaser 1500.

Switching printer emulations

There are three ways to switch printer emulations: SelecType, the Intelligent Emulation Switch (IES), and emulation control languages.

SelecType

To choose different printer emulations for one or more of the printer's interfaces (parallel, serial for the ActionLaser 1500 only, or optional) using SelecType, follow the instructions below:

1. Press the LEVEL 2 button to enter SelecType Level 2. Press ▼ until you see the EMULATION option. Press ▶ once.

2. Press ▼ until you see the interface channel (P, S, or O) you want to assign.

3. Press ▶ once. Then press ▼ until you see the emulation you want (for example, LQ or FX).

4. Press ▶ to set the emulation.

5. Repeat steps 2 through 4 if you want to switch emulations in any other channel. Then press the EXIT button to exit SelecType.

Intelligent Emulation Switch

The Intelligent Emulation Switch is available when you install the optional PostScript@ identity card. See Chapter 5, "Options" for more information on identity cards.

When you install the optional PostScript card and set the Intelligent Emulation Switch (IES) setting with the SelecType Level 2 EMULATION option, you can access several emulation pairs:

Emulation Pairs	*SelecType option*
❑ PostScript & LaserJet IIP	**PS&LJ=2P** (ActionLaser 1000)
❑ PostScript & Laser Jet III	**PS&3/P/Si** (ActionLaser 1500)
❑ PostScript & LQ	**PS&LQ**
❑ PostScript & FX	**PS&FX**
❑ PostScript & GL/2	**PS&GL/2** (ActionLaser 1500)

The IES setting enables the printer to switch automatically between the two emulations in each pair indicated by the IES setting.

To select IES, first install the optional PostScript identity card, then follow the SelecType procedure shown above.

By pressing ▼ when you are using one of the IES emulation pairs, you can manually switch between PostScript and the other emulation selected. Hold down ▼ until an asterisk appears on the desired emulation pair.

Emulation control languages

Note:
Emulation control languages are intended for experienced users and programmers.

Three emulation control command languages are available to change the printer emulation:

- Epson Job Language (EJL)
- Printer Job Language (PJL)
- Emulation Switch (ES).

Epson Job Language (EJL)

The Epson Job Language is an original Epson language. It can perform the following operations for your printer:

- Switching the printer emulation
- Transferring the printer's system information to the computer
- Entering the Printer Job Language (PJL) mode.

EJL can switch the printer emulation with a monodirectional interface, but a bi-directional interface is required for the computer to receive system information from the printer.

For more details on EJL commands, see the end of this section.

Printer Job Language (PJL)

The Printer Job Language mode uses PJL commands to change printer emulations. Because the PJL mode emulates the HP LaserJet series IIP (ActionLaser 1000) or III (ActionLaser 1500) printer PJL feature, you can use software written for that printer when it is shared in a network environment.

You can also enter the EJL mode from the PJL mode. For information on the PJL commands, see Appendix B.

Emulation Switch (ES)

This feature lets you use printer commands to switch directly between the PostScript and LaserJet emulations.

To switch from LaserJet to PS emulation, send the following:

<ESC><DEL>

To switch from PS to LaserJet emulation, use your software to send the following:

executive<CR>[<LF>]
serverdict<SP>begin<SP>0<SP>exitserver<CR>[<LF>]
executive<CR>[<LF>]
statusdict<SP>begin<CR>[<LF>]
5<SP>setsoftwareiomode<CR>[<LF>]
^D

Code in brackets [ ] are not absolutely necessary. <SP> represents a space.

Epson Job Language command summary

The EJL mode enables your printer to switch to any emulation available. To operate in EJL mode, follow the steps below:

1. Exit the current (or default) printer emulation and enter EJL mode with the universal exit command.

2. If you wish, send other EJL commands, such as the comment command, to the printer.

3. Send an EJL command to enter a new printer emulation from the EJL mode.

Perform these steps by sending specific commands from your computer to your printer. For step 1, always send the universal exit command:

<ESC><SOH>

Next you must immediately send an EJL command. For example, you can enter the LQ emulation by sending the following commands.

"@EJL ENTER LANGUAGE = LQ"<LF>

The printer emulation indicated on the display changes to the new one.

Overview of the EJL commands

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

Every EJL command starts with the string: @EJL, 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 EJL command; only an LF code terminates the EJL command. If the EJL command is not followed by an LF code, the printer does not recognize it as an EJL 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 mode, you cannot exit with the universal exit command. You must switch emulations with SelecType.

Command summary for using EJL

<ESC><SOH> Universal exit language/Start of EJL

Format:

ASCII code: ESC SOH
Decimal: 27 1
Hexadecimal: 1B 01

Description:

Exit current printer emulation and enter EJL mode

Note:
From Epson GL mode, you cannot enter the EJL mode 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:

PS, LJ-2P, 3/P/Si, LQ, FX, Epson GL, Epson GL2, PJL

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
<comment> [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 bidirectional 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 (HT) (decimal 9). Commands marked with brackets can be omitted.

Chapter 2

Paper Handling

Choosing Paper

For best results, use paper made especially for laser printers. Paper made for plain-paper copiers is also a good choice. Paper should be of good quality and relatively smooth. Since the printer is sensitive to moisture, keep it dry.

You can use the printer's paper bin to feed most types of 60 to 90 g/m^2 (16 to 24 lb) letter-size paper. If you feed paper or other media one sheet at a time, you can use up to 157 g/m^2 (42 lb) paper.

You may use colored paper but not paper to which a colored coating has been added.

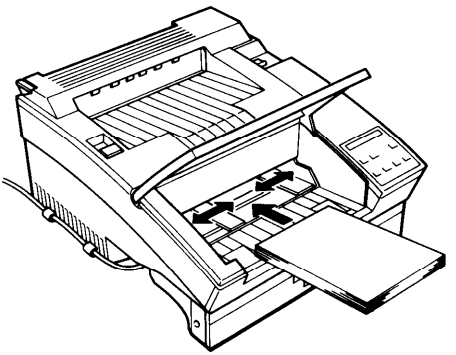
Note:
The quality of any particular brand or type of paper my be changed by the manufacturer at any time, so Epson *cannot guarantee any particular one. Also, some inks or dyes may smear or come off when subjected to the high temperature of the fuser. Always test samples of paper stock before purchasing large quantities or printing large jobs.*

Selecting a paper size

If you use a paper size other than letter and your software does not allow you to select a new size, see the PAGE SIZE option in Chapter 4, "SelecType."

Loading Paper

To load a letter-size stack of paper into the printer, fan the paper, open the paper cover, adjust the paper guides, and insert the paper into the paper bin.



After you close the paper cover, make sure the paper stopper on top of the paper cover is inserted in the slot closest to the center of the printer. Make sure that the paper path selector on the top left corner of the printer is set to the face-down position. For an illustrated explanation of this procedure, *see your Setup and Maintenance* guide.

Loading single sheets

If you want to print on paper other than letter size, you need to load the paper one sheet at a time through the paper bin feed slot. The printer accommodates hand-fed paper ranging in size from 86 x 140 mm (3.4 x 5.5 inches) to 216 x 356 mm (8.5 x 14 inches), envelopes, transparencies, labels, and heavy paper (over 90 g/m^2 or 24 lb).

To feed paper one sheet at a time, follow these steps:

1. Select the paper size using your application software. If this is not possible, use SelecType to choose the size of the paper.

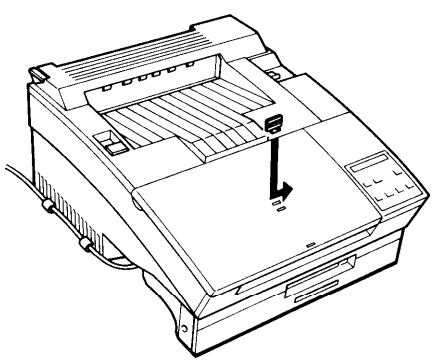
2. Make sure the printer is on line.

3. Open the paper cover and remove the stack of paper from the paper bin.

4. Adjust the paper guides to match the size of paper you are using. Insert a sheet of paper into the bin until it meets resistance and then close the paper cover.

   Note:
   For printing on envelopes, labels, transparencies, and heavy paper, set the paper path selector on the top left corner of the printer to the face-up position. If you feed single sheets regularly, you may want to install the optional face-up output tray. See Chapter 5, "Options."

5. If you leave the paper feed selector in the face-down position, install the paper stopper to match your paper size by inserting its hooked prong into the appropriate slot on the top of the paper cover and sliding it to the right.



6. Make sure the ON LINE light is on; then you can send data to the printer from your computer.

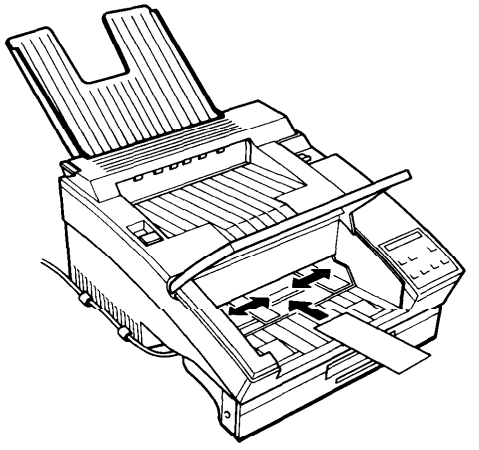
When you are finished feeding single sheets, open the paper cover, readjust the paper guides, and replace the stack of letter-size paper in the paper bin. If necessary, reset the paper path selector on the top left corner of the printer to the face-down position.

Loading envelopes, /labels, transparencies, and heavy paper

Use only labels and overhead projector transparencies designed to be used with laser printers or plain-paper copiers. Since envelopes, labels, transparencies, and heavy paper must be fed through the printer one sheet at a time, read this section and then see "Loading single sheets" discussed earlier in this section.

Note:
If you feed envelopes, labels, transparencies, and heavy paper, you should set the paper feed selector to the face-up position. If you feed single sheets regularly you may want to install the optional face-up paper tray. See Chapter 5, "Options."

ENVELOPES--Print quality may appear irregular on envelopes because some parts of the envelope are thicker than others. Test a sample making sure to feed the envelope flap-side down. Adjust the print density using SelecType Level 2 if printing is too light.



LABELS---Before printing on labels, test to see whether or not the label sheet leaks adhesive by pressing a sheet of paper on top of the sheet of labels. If the paper sticks at all, don't use the labels.

Chapter 3

Troubleshooting

General Problems

CAUTION:
Whenever you ship or transport the printer, first remove the toner cartridge and place it in a plastic bag. Then seal the bag to prevent the fine toner particles from pouring into the printer or onto your clothing.

Printer stops and FEED JAM message appears

1. Open the paper cover. Carefully remove all the paper in the paper bin along with any sheets that have fed part way into the printer.

2. If the paper tears when you remove it, make sure you remove any pieces remaining in the printer. To do this, gently open the printer cover.

   WARNING:
   If you open the printer cover you expose the fuser, which is marked by a CAUTION HOT SURFACE *label. Be careful not to touch the fuser.*

   Remove the imaging cartridge. Then remove any paper from the paper feed path, reinsert the imaging cartridge, and close the printer cover.

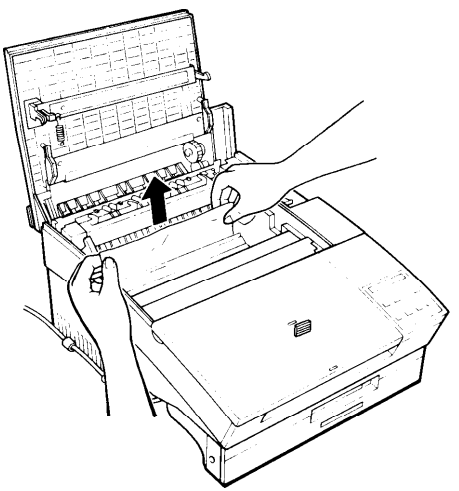
3. Tap the edges of the paper stack on a flat surface and carefully reload it into the paper bin. (Do not reload curled or wrinkled sheets.) Close the paper cover.

4. The jammed page is automatically reprinted. If you did not open the printer cover to clear the feed jam, press CONTINUE.

1. Gently open the printer cover and remove the imaging cartridge.

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

2. Gently pull out the paper. If it tears, make sure you remove any pieces remaining in the printer.



Note:
Because the toner on the paper inside the printer may not have been fixed on the page, toner may come off on your hands when you remove the paper. If you spill toner on your clothing, rinse it off with cold water. Using hot water may leave a permanent stain. When you resume printing, the first few pages may be slightly smeared with excess toner.

3. Reinstall the imaging cartridge. Then close the printer cover.

4. After a paper jam, the jammed page is automatically reprinted.

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, one that is not too thin or rough. Some types of paper require single sheet feeding. See Chapter 2.*
- ❑ *Fan the stack of paper and then tap it on an edge to align it before you load it.*
- ❑ *Be sure that you do not load too much paper in the bin.*
- ❑ *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 face-down output tray on top of the printer.*
- ❑ *Try turning over the stack of paper in the bin. Most packages of paper indicate the best side with an arrow on the end of the package. Make sure the best side is loaded face down.*

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 *Setup and Maintenance* guide.

The interface cable may not be plugged in securely. Check both end s 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.

Make sure that you have selected the appropriate interface (parallel, serial for the ActionLaser 1500 only, or optional) with SelecType. If you are using the serial interface, also set the baud rate, protocol, data bit, and related settings. See your computer manual for the correct settings and interface requirements. If you are using the parallel interface, make sure the BUSY DELAY option in SelecType Level 2 is set to 0.

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

The imaging cartridge may be empty. Replace it as described at the end of this chapter.

Printer doesn't print and the ON LINE light is off

Press ON LINE once to set the printer on line (the ON LINE light comes on).

Font selected with software commands won't print

Be sure you have installed the correct font cartridge and 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 serial interface, make sure that both the computer and printer are set to use the same number of data bits per word and that they both use the same parity, baud rate, and number of stop bits.

If the printer still does not print correctly, contact your dealer.

Position of the printout not correct

Make sure that you are using the correct page length and margin settings in your application 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 LJ-2P emulation, be sure that your graphics software is set for a LaserJet II printer.

If you are using a serial interface, make sure that you set an 8-bit data word and not a 7-bit word in your interface settings in SelecType.

Graphics require large amounts of memory; see "Memory Problems," in this chapter for more help.

SelecType does not function as expected

Application software programs override SelecType settings. Therefore, use software settings instead of SelecType settings whenever possible.

Your setting may have been changed by your software program. Perform a factory reset by pressing the RESET button while you turn on your printer. Then try printing using the section "Testing the computer-to-printer connection" in your *Setup and Maintenance* guide.

You may have entered the wrong SelecType level. See the Quick Reference card whenever you use SelecType.

You may be trying to select a setting that is not available in the currently selected printer emulation. To check the available options, see Appendixes B and C.

You may be trying to set up different SelecType configurations for different printer emulations. See Appendixes B and C for more information.

Never save settings to the same macro number in different interface channels.

Print Quality Problems

Dark or dirty background

Change the DENSITY option in SelecType Level 2 for light print.

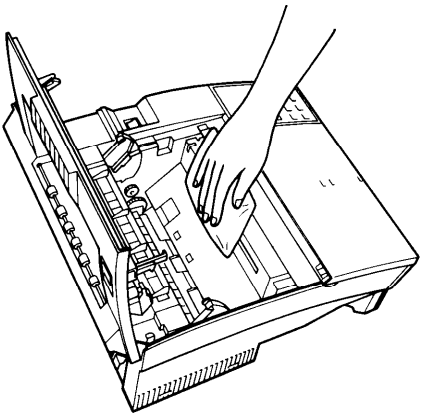
Clean the paper path inside the printer using a clean, soft, dry cloth.

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 from side to side, and then reinstall it. If this does not solve the problem, replace the imaging cartridge as described at the end of this chapter.

Vertical black or white bands or lines

Clean the printer lens. 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 re-insert the imaging cartridge in the printer and close the printer cover. If the problem remains, install a new imaging cartridge as described at the end of this chapter and print several pages to check the print quality.

Horizontal black or white bands or black page

Install a new imaging cartridge as described at the end of this chapter.

Uneven darkness

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

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.

If this does not solve the problem, install a new imaging cartridge as described at the end of this chapter. 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.

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 at the end of this chapter.

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, "Paper Handling," for information on choosing paper.

Completely blank pages

If, after checking the SelecType Level 2 TONER option, the TONER message indicates that the amount of toner is low (E* F), replace the imaging cartridge as described at the end of this chapter.

Check to be sure the imaging cartridge is installed as described in the *Setup and Maintenance* guide.

The problem may be with your software program or interface cable. Run a feature print or print out a status sheet. 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 option in SelecType Level 2 for darker print.

If, after checking the SelecType Level 2 TONER option, the TONER message indicates that the amount of toner is low (E" F), replace the imaging cartridge as described at the end of this chapter.

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 from side to side to distribute the toner, and then reinstall it. If the problem persists, replace the imaging cartridge as described at the end of this chapter.

Image is too dark

Use the DENSITY option in SelecType Level 2 for lighter print.

If the problem persists, replace the imaging cartridge as described at the end of this chapter.

Non-printed side of the page is dirty

Toner may have spilled in the paper feed path. Remove the imaging cartridge and then clean the paper path of the printer using a clean, soft, dry, 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.

Memory Problems

All of the following messages indicate that you need to simplify the page you are trying to print, change your memory allocation, or add more memory to your printer.

ADD MEMORY FOR CH X
INSUFF MEMORY
PAGE BUFFER FULL
SET FULL PRINT

The first solution you can try for each of these is simplifying your page by reducing the number or size of fonts or the number or size of graphics or both. The second solution to try is to reduce the RX-buffer size if it is higher than the default value. If these are not satisfactory solutions, try the other solutions described below under the appropriate error message.

ADD MEMORY FOR CH X (P, S or O)

This appears only when you are using the USER INDIVIDUAL option. It indicates which interface channel needs more memory. Try each of the following until you have solved the problem:

1. In the SelecType INDIVIDUAL option, increase the memory allocated to the channel indicated.

2. Change the SelecType USER option from INDIVIDUAL to AUTOSENSE.

3. Add memory to the printer. See Chapter 5, “Options,” for details.

INSUFF MEMORY

1. Press CONTINUE to clear the error.

2. If the message remains, press RESET or initialize the printer as described in Chapter 4.

You can also clear this error by turning the printer off and back on again, However, it may be necessary to simplify the page you are trying to print or to add more memory to the printer. See Chapter 5 for details.

PAGE BUFFER FULL

1. Press CONTINUE to clear the error.

2. If the message remains, it may be necessary to simplify the page you are trying to print or to add more memory to the printer. To add memory, see Chapter 5.

SET FULL PRINT

1. Press CONTINUE to clear the error.

2. Change the SelecType Level 1 FULL PRINT setting as described in Chapter 4.

Option Problems

A font cannot be selected or the message CARD ERROR appears

Remove and carefully reinsert the cartridge.

Make sure the cartridge is listed in the table of available font cartridges in Chapter 5, "Options."

Paper does not feed from the optional lower paper cassette

Be sure you have made the proper choice with your application software.

The INPUT menu in SelecType Level 1 may be set to STD. To use the optional lower paper cassette, the INPUT menu in SelecType Level 1 must be set to OPT or AUTO. Change the setting as described in Chapter 4, "SelecType."

There may be no paper in the lower paper cassette. Load it with paper.

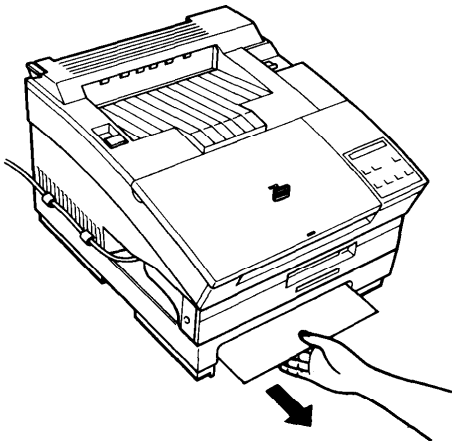
Be sure that the lower paper cassette is properly installed and that you have not tried to load it with too many sheets of paper. The cassette can hold a maximum of 250 sheets of 75 g/m^2 (20 lb) paper.

The lower paper cassette may not be installed properly. See Chapter 5 for instructions on installing the lower paper cassette.

FEED JAM with optional lower paper cassette

1. Remove the lower paper cassette as shown below.

2. Remove any folded or curled paper from the front opening. Then remove all 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. See the section on using the optional lower paper cassette in Chapter 5, "Options," for more information.

   Note:
   Make sure you are using paper that meets the specifications for this printer. See Chapter 2 for the correct paper to use.

5. Press CONTINUE. The jammed page is automatically reprinted.

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

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

Even with additional memory installed, complex pages don't print and INSUFF MEMORY message still appears

FULL PRINT, RX-BUFFER, or memory share ratio (the allotment of memory per interface channel) setting of the USER INDIVIDUAL menu in SelecType may need to be changed. See "Memory Problems" in this chapter for more information.

You may not have installed enough memory. If you have an ActionLaser 1000, you can add up to 6.0MB of memory for a total of 6.5MB. If you have an ActionLaser 1500, you can add up to 4.0MB of memory for a total of 5.0MB. If you have installed all possible memory and the error message continues to appear, you may have to simplify the document you are trying to print.

Messages

Status, error, and caution messages tell you what the printer is doing, including what may be wrong and, in some cases, how to correct the problem.

This section contains an alphabetical list of these messages and how to correct any problems.

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 option in SelecType is ON, some errors clear automatically even though the problem remains. In most instances, you should leave AUTO CONT OFF.

Status messages are indicated by [S] and error messages by [E]. (In some cases the message on the display also shows the printer emulation.)

ADD MEMORY FOR CH X [E]

There is not enough memory for Channel X. See "Memory Problems" earlier in this chapter.

CARD MEMORY OVERFLOW [E]

This indicates that the memory of a font card in slot A exceeds 4MB. Remove the card and press CONTINUE.

COPY END X/X [S]

Appears when you press the COPY END button to cancel multiple-copy printing when the printer is off line. The first X is the number of the current page and the second X the number of copies selected in SelecType.

COVER OPEN [E]

The printer cover is open. Close it to continue printing. This message also shows the amount of toner left in the imaging cartridge. For example: A full toner amount is E*****F.

DATA [S]

The printer has received data but is not yet printing, or the printer has received data and is off line. To resume printing, press ON LINE if the printer is off line, or press FEED.

EJL [S]

The printer is in EJL mode. See "Emulation control languages" in Chapter 1.

FACTORY RESET [S]

The printer is being initialized to the factory settings.

FEED JAM [E]

Paper is not feeding into the printer from the specified paper bin or cassette or has jammed on its way into the printer. See the FEED JAM section in this chapter for information.

ILLEGAL CARD #X [E]

The card or cartridge in slot X cannot be read. To correct this error, press CONTINUE. If the error message remains, make sure the printer is off line and reinsert the card or cartridge as described in Chapter 5, "Options."

INITIALIZE [S]

The printer is being reset to the default settings.

INSUFF MEMORY [E]

The printer has insufficient memory available for the task you have given it. To correct the error, press CONTINUE. If the message remains, press RESET or perform INITIALIZE as described in Chapter 4. See "Memory Problems" earlier in this chapter.

INVALID ASSIGN [E]

If you assign PostScript to more than one channel, this message appears when you attempt to exit SelecType. Press 4 to return to EMULATION and change the channel assignments.

NEW CARTRIDGE? [S]

The printer asks if you replaced the imaging cartridge. Press RESET to change the TONER setting to **NEW** if you just replaced the cartridge. Otherwise, press CONTINUE to clear the message.

PAGE BUFFER FULL [E]

Text or graphics data has filled the printer's buffer and the printer has ejected an incomplete page. Press CONTINUE to clear the error. See "Memory Problems" earlier in this chapter.

PAPER FEEDING [S]

The printer is feeding paper.

PAPER JAM [E]

See the PAPER JAM section earlier in this chapter.

PAPER OUT [E]

There is no paper in the standard paper bin and the optional lower paper cassette (if installed). Load more paper into the selected paper bin or cassette and press ON LINE. See Chapter 2, "Paper Handling."

PAPER OUT (paper source) (paper size) [E]

There is no paper in the paper source from which the printer expects to feed paper. The right column of the display prompts you to load the correct paper size into the paper bin or cassette. Press ON LINE.

PAPER SIZE ERROR [E]

The paper size you selected with SelecType (or the default size if you have not selected a size) does not match the paper loaded in the selected paper source. Press CONTINUE to clear the error. Insert the correct paper or change the paper size setting with your application software or with PAGE SIZE in SelecType as described in Chapter 4.

PJL [S]

The printer is in PJL mode. See “Emulation control languages” in Chapter 1.

PRINTING [S]

The printer has received data and is printing.

PRINT PAUSED X/X [S]

The printer stops printing during a multi-copy print operation. The first X is the printed number of the current page and the second X the number of copies selected in SelecType.

PS& xxx [S]

The printer is using the intelligent emulation switch and is not in a timeout status. The asterisk (*) indicates the currently-used emulation. It can use either one of the emulations shown on the display. XXX is the emulation paired with PostScript.

RAM CHECK X.X MB [S]

The printer is checking RAM (X.X = capacity).

RAM Error [E]

This indicates an error was found during RAM CHECK. Turn off the printer. If you installed the optional memory chip sets, remove the controller board and check installation as described in Chapter 5. If the error message appears again, contact your dealer.

READY [S]

The printer is ready to receive data or print.

READY:X DUMP [S]

The printer is in the data dump mode. See “Data Dump Mode” later in this chapter.

REINSERT CARD [E]

You may have removed a card or cartridge while the FEED light was still lit or while the printer was on line. Make sure the printer is off line, reinsert the card or cartridge into the correct slot, and press CONTINUE.

REMOVE CARD [E]

You may have inserted a card or cartridge while the printer was on line or while the FEED light was on. To correct this error, take the printer off line, then remove the card or cartridge and press CONTINUE. Before you re-insert the card or cartridge, make sure that all data in the buffer has been printed and that the printer is off line. If the FEED light is on, press FEED to print out the remaining data.

RESELECT TRAY [E]

The optional lower paper cassette is not installed and the SelecType INPUT option is set to OPT or AUTO. Install the optional lower paper cassette; then press CONTINUE or simply press CONTINUE and paper is automatically selected from the standard paper bin. Then change the INPUT option to STD.

RESET [S]

The printer has been reset to its previous setting using the macro number specified with LOAD MACRO in SelecType.

ROM Check [S]

The printer is checking ROM.

SAVE MEMORY OVERFLOW [E]

The printer does not have enough memory to save any additional macros. To correct this error, delete unused macros using the DELETE MACRO submenu; then repeat SAVE MACRO.

SERVICE REQ. CXXXX [E]
SERVICE REQ. E00XX [E]

A controller or print engine error has been detected. Write down the error number that appears in the right column of the display and turn off the printer. Turn the printer back on after a few seconds to see if the error message still appears. If it does, turn off the printer, unplug the power cord from the electrical outlet, and contact a qualified service person.

SET FULL PRINT [E]

This message may appear when you are trying to print graphics or a mix of text and graphics. Press CONTINUE, then see "Memory Problems" earlier in this chapter.

STANDBY XXX [S]

When the STANDBY menu is set to ENABLE, the printer enters the standby mode if it is not used for about thirty minutes. Press any panel button or send data to warm up the printer.

STARTUP ERROR [E]

To clear this error, press ◀ to select LT paper. WAIT appears as the printer returns to its default settings.

TRAY SET (paper source) (paper size) [E]

The paper size setting does not match the paper loaded in the specified paper source. The right column of the display indicates the expected paper size and the currently selected paper source. You can either change the paper size setting or load the correct paper size. After you correct the paper mismatch, press CONTINUE.

WAIT [S]

The printer is being reset after a STARTUP ERROR.

WARMING UP [S]

The printer is warming up. The amount of toner left in the imaging cartridge is also displayed. For example: A full toner amount is E*****F.

Data Dump Mode

The 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 computer. The data dump mode produces an exact printout of the codes reaching the printer.

1. Make sure that the printer is loaded with paper and turned off.

2. Hold down the LEVEL 2 button while you turn on the printer. Make sure you hold the button down until the READY :X DUMP message appears. (X is the channel in use.)

3. Run any program that causes the printer to print (either an application program or a program written in any programming language). Your printer prints out all of the codes sent to it in hexadecimal format as shown in the sample below.

```
        ********          HEX DUMP LIST          ********          PAGE     1

0000    1B 40 1B 74 01 1B 52 00 1B 32 1C 26 1C 6B 00 1C   .@.t..R..2.&.k..
0001    78 00 1B 43 46 1B 4A 86 1B 24 2C 00 1C 2E 1B 6B   x..CF.J..$,....k
0002    00 1B 21 00 1B 78 01 43 68 61 70 74 65 72 1B 24     ¦  .x.Chapter.$
0003    5A 00 35 1B 4A 32 1B 24 2C 00 54 72 6F 75 62 6C   Z.5,J2.$,.Troubl
0004    65 1B 24 5A 00 73 68 6F 6F 74 69 6E 67 1B 4A 5E   e.$Z.shooting.J^
0005    1B 24 2C 00 54 68 69 73 1B 24 48 00 63 68 61 70   .$,.This.$H.chap
0006    74 65 72 1B 24 77 00 64 69 73 63 75 73 73 65 73   ter.$w.discusses
0007    1B 24 B1 00 70 72 6F 62 6C 65 6D 73 1B 24 E6 00   .$..probLems.$..
0008    79 6F 75 1B 24 FC 00 6D 61 79 1B 24 13 01 65 6E   you.$..may.$..en
0009    63 6F 75 6E 74 65 72 1B 24 4D 01 61 6E 64 1B 24   counter.$M.and.$
000A    64 01 74 68 65 69 72 1B 24 86 01 6C 69 6B 65 6C   d.their.$..likel
000B    79 1B 4A 32 1B 24 2C 00 73 6F 6C 75 74 69 6F 6E   y.J2.$,.solution
000C    73 2E 1B 4A 32 1B 24 2C 00 49 66 1B 24 3C 00 61   s..J2.$,.If.$<.a
000D    6E 1B 24 4D 00 65 72 72 6F 72 1B 24 6F 00 6F 63   n.$M.error.$o.oc
000E    63 75 72 73 2C 1B 24 9E 00 79 6F 75 1B 24 B4 00   curs,.$..you.$..
000F    62 65 73 74 1B 24 D1 00 73 6F 75 72 63 65 1B 24   best.$..source.$
```

4. To turn off the data dump mode and stop printing, press ON LINE to set the printer off line. (If you press ON LINE while a page is being printed, the green ON LINE light flashes until the page is ejected and the printer goes off line.) To exit the data dump mode, turn off the printer or hold down the RESET button until **INITIALIZE** appears on the display.

Look at the sample data dump printout shown in Step 3. By reading the characters printed in the text field on the right side of the data dump printout or the printout of hexadecimal codes, you can check what codes are being sent to the printer. In the text field, printable characters appear as their true ASCII characters. Non-printable codes, such as control codes, are represented by dots.

For example, look at the first two hexadecimal codes on line 0006 of the printout sample *(74* 65). Code 74 represents the letter t; code 65 represents the letter e. Check the seventh line of the text field on the right side of the printout and you will find the letter t followed by the letter e.

Replacing the Imaging Cartridge

The imaging cartridge prints up to 6,000 pages depending upon the complexity of your print jobs.

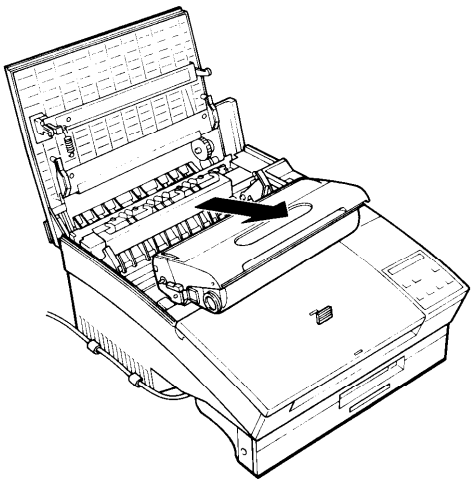
If your printed images become faint, enter the SelecType Level 2 TONER option to find out approximately how much toner remains in the imaging cartridge. Simply count the asterisks between the E (empty) and the F (full). Each asterisk represents up to 20% of the total toner capacity. When you see only one asterisk on the SelecType TONER message indicating that there is less than 20% toner left, you should replace the imaging cartridge.

WARNING:
Do not touch the fuser, which is marked with a CAUTION HOT SURFACE label.

1. Turn on the printer.

Note:
If you replace the cartridge when the power is off, you must change the TONER setting to ***NEW*** *using SelecType when you turn on the printer. See steps 7 and 8 later in this section.*

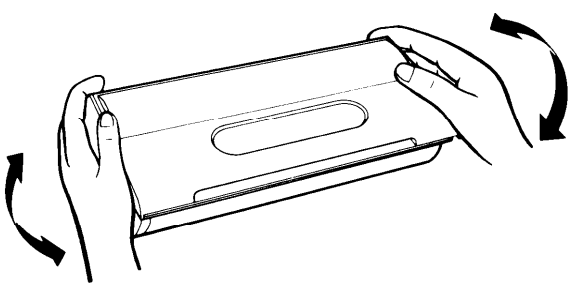
2. Gently open the printer cover and remove the imaging cartridge by pulling it toward you.



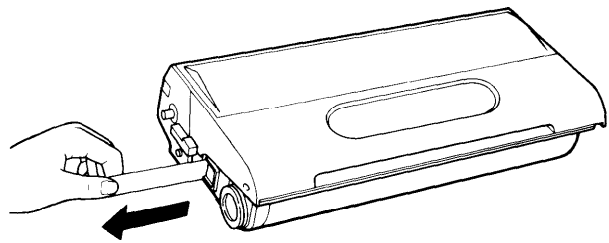
3. Dispose of the imaging cartridge with nonburnable items.

CAUTION:
Do not turn the imaging cartridge upside down.
Do not expose the imaging cartridge to light any longer than necessary.

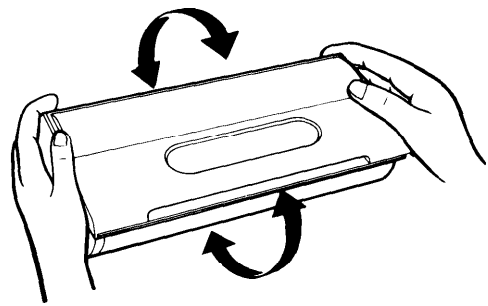
4. While holding the new imaging cartridge horizontally, gently shake it side to side a few times to distribute the toner evenly.



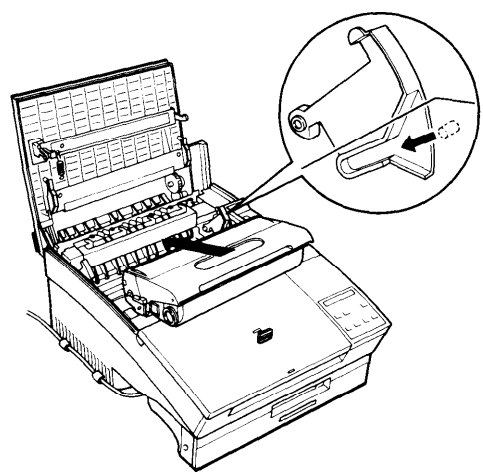
5. Firmly grip the tab on the left side of the imaging cartridge. Pull the clear seal all the way out with firm, even pressure.



6. Hold the cartridge and gently shake it front to back.



7. Insert the cartridge by placing the pins on each side of the cartridge into the grooves inside the printer. Slide it gently into the opening until it stops. Leave the cover open.

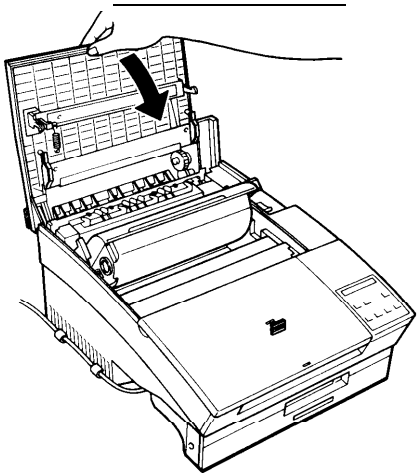


8. Next you reset the TONER setting. Three messages flash in rotation on the display:

   NEW CARTRIDGE?
   YES, PRESS RESET
   NO, PRESS CONTINUE.

9. Press RESET to change the TONER setting to **NEW (full).**

10. Gently press down on the printer cover until it clicks shut.



Please note: If you replace the cartridge when greater than 20% toner is left, the three rotating messages do not appear. Instead **COVER OPEN E"* F** (two or more asterisks) appears. Use the SelecType Level 2 TONER option to change the setting to **N E W.**

If you do not change the TONER setting to **NEW** after replacing the cartridge, the TONER message will not be correct. Also **NEW CARTRIDGE?** appears even if the toner level is full.

Note:
Each time you replace the cartridge, print a feature print to be sure the print quality is satisfactory and that you installed the cartridge properly. See "Test printing" in the Setup and Maintenance guide.

Chapter 4

SelecType

SelecType Overview

The SelecType function on the printer control panel lets you control most of the printer's functions, such as printing test pages, selecting paper size, and changing the printer's configuration.

At the back of this guide, you'll find a *Quick Reference* card that includes a map of all the SelecType menus and options.

To view the current SelecType settings, print the status sheet as described later in this chapter.

You can test many of these options by setting them, and then performing a DOS Print Screen. See "Testing the computer-to-printer connection" in your *Setup and Maintenance* guide.

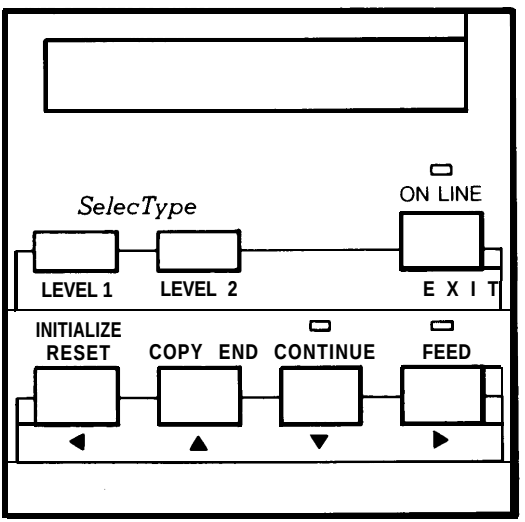
Your application program settings usually override the SelecType settings. Therefore, use application program settings whenever possible.

Using SelecType

This section explains how to use SelecType.

The control panel

The control panel contains the display, two SelecType buttons, one ON LINE/EXIT button, three indicator lights, and four function/arrow buttons.



The display

When you enter SelecType, menus and options appear on the display. The display shows SelecType menu titles on the left side and options for each menu on the right side.

The display also uses the icons shown below:

♦	This icon to the left of an option indicates that you can press either A or ▼ to view other options in the menu.
➔	This icon to the left of an option indicates it is the current selection. You can use ▲ or ▼ to view other options.
▶	This icon indicates that you can press ▶ to enter a submenu, select an option, set an option, or execute an action.

Buttons

LEVEL 1	Enter SelecType Level 1.
LEVEL2	Enter SelecType Level 2.
EXIT	Exit SelecType Level 1 or Level 2.

Use the arrow buttons to move through menus and to select, display, set, or execute SelecType options.

▶	Enter a submenu, set an option, or select or execute an action.
◀	Return to the main menu.
▲ ▼	Display options in the same menu. You can view the options one at a time by pressing the buttons once or you can scroll through them quickly by holding down one of these buttons.

SelecType tutorial

1. Note that the first thing you will see on the display before entering SelecType is:

   ```
   READY   :  P  LJ-2P
   ```

   For the ActionLaser 1500, you will see **READY:P 3/P/Si.** Make a note of the interface channel, for example, P=parallel. You may need this information later.

2. Press the LEVEL1 button to enter SelecType Level 1.

3. The main menu option appears. The ▶ icon indicates that you can enter the submenu by pressing ▶ . In many cases, the display also shows the current setting, as shown below.

   ```
   ♦ INPUT    AUTO    LT    ▶
   ```

4. Enter the options submenu by pressing ▶ .

   ```
   INPUT → AUTO    LT ▶ SET
   ```

   → indicates the option is selected.

5. Display the other submenu options by pressing ▲ or ▼ .

   ```
   INPUT    ♦ STD        ▶ SET
   ```

   ♦ indicates the option is not selected. The message on the right, ▶ **SET,** indicates you can select the option displayed by pressing ▶ .

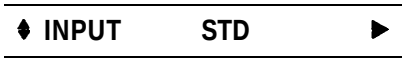
In the INPUT submenu, you can display any of the options listed below.

AUTO
STD
OPT

OPT appears only when you have installed the optional lower paper cassette unit.

Note:
Although the main menu options are the same for all printer emulations, some Level 1 submenu options are different in each emulation. See the Appendix that describes the printer emulation you are using for a description of the submenu options for that emulation.

6. When you reach the option you want to select, press ▶ to set the option. SET disappears from the display and the ▶ icon moves to the right of the display indicating that the new option has been selected.



At the same time, ♦ moves to the left of the main menu option, indicating that you are back in the main menu.

Note:
If you want to return to the main menu at any time without changing a setting, press ◀ to exit the submenu.

7. Exit SelecType. To exit SelecType from any main menu or submenu, press the EXIT button. The display shows the **READY** message.

Note:
Once you set an option, the setting remains in effect until you change it again or turn off the printer. If you want a setting to remain in effect even when you turn the printer off and on, you can use the SYSTEM CONFIG. option to save Level 1 settings. See 'MACRO" later in this chapter. Level 2 settings are saved automatically when you exit Level 2.

Options

This section lists all the menus and options available. Most menus and options are the same in the different printer emulations. However, some have a different function for each emulation. These menus are listed in the appendix that describes the printer emulation. *See* the *Quick* Reference card at the back of this *Reference Guide* for a map of all SelecType menus and options.

When you enter SelecType Level 1, you see one of these options:

INPUT	**STATUS SHEET**
PAGE SIZE	**FONT SAMPLE**
COPIES	**SUB CONFIG.**
ORIENT.	**SYSTEM CONFIG.**
FONT	

When you enter SelecType Level 2, you see one of these options:

FEATURE PRINT	**LANG.**
EMULATION	**DENSITY**
INTERFACE	**TONER**
RX-BUFFER SIZE	**VERSION**
USER	**PAGE COUNTER**
CH TIMEOUT	**RITech**
AUTO CONT.	**STANDBY**

AUTO CONT.

This Level 2 option permits the printer to automatically continue printing after a certain period of time when one of the following errors occurs: **SET FULL PRINT, PAGE BUFFER FULL, PAPER SIZE ERROR, TRAY SET XXX, INSUFF MEMORY, and SPL IGNORED.** When this option is OFF, you must press the CONTINUE button to resume printing. In most cases, leave this option set to OFF.

Menu/submenu			Available options
♦ **AUTO CONT.**	**OFF** ▶		**ON** or **OFF**

CH TIMEOUT

This Level 2 option sets the time for a channel timeout. If the printer is on line and receives no new data for the number of seconds specified, and if there is data in another channel, the printer automatically switches to the channel with data. The factory setting is 60.

Menu/submenu			Available options
♦ **CH TIMEOUT**	**60** ▶		**10 to 600 (in increments of 10)**

COPIES

This Level 1 option selects the number of copies to be printed up to 999. The factory setting is 1. If you select a number greater than one, the display keeps count of the number of copies completed and the current setting. For example, if you set the COPIES option to 10 and five copies have been printed, the display shows 5/l0.

Menu/submenu			Available options
♦ **COPIES**	**1** ▶		**1 to 999**

DENSITY

Use this Level 2 option to adjust the print density if your print is too light or too dark. Use 1 or 2 asterisks to lighten a dark image. Use 4 or 5 asterisks to darken a light image. The default setting is 3 asterisks.

Menu/submenu					Available options
♦	**DENSITY**	**L***	**D**	▶	**L*****D** **L****D** **L***D** **L**D** **L*D**

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

EMULATION

This Level 2 option selects the printer emulation for each interface you are using. The ActionLaser l000 default is LJ-2P and the ActionLaser 1500 default is 3/P/Si. For more information on each printer emulation, see Appendixes B and C. After **EMULATION** appears, press ▶ once to see the following display:

Menu/submenu				Available options
♦	**CH P**	**LJ-2P**	▶	**CH P (Parallel) LJ-2P** or **3/P/Si** **CH S (Serial) 3/P/Si** (ActionLaser 1500 only) **CH O (Optional) LJ-2P** or **3/P/Si**

First select the interface (P, S, or 0) by pressing ▼. Then press ▶ to display the next emulation. The following appears:

Menu/submenu			Available options
CH P	**➔ LJ-2P**	**▶ SET**	**LJ-2P** (ActionLaser 1000 only) **LQ** **FX** **3/P/Si** (ActionLaser 1500 only) **Epson GL** **PS** **Epson GL/2** (ActionLaser 1500 only) **PS&3/P/Si (IES setting)** **PS&LJ-2P (IES setting)** **PS&LQ (IES setting)** **PS&FX (IES setting)** **PS&GL/2 (IFS setting)**

The ActionLaser 1000 resident emulations are LJ-2P, LQ, and FX. The ActionLaser 1500 resident emulations are 3/P/Si, LQ, FX, and GL/2. The other emulations, Epson GL and I'S, appear on the display if the corresponding identity card is installed. In addition, if you have an ActionLaser 1000, the optional PCL5/RITech board must be installed for 3/P/Si and Epson GL/2 to appear.

Note:
When you are using a program you developed that sends PostScript files, be sure that data is followed by a Ctrl-D (^D). Otherwise, the printer does not switch the emulation properly with the Intelligent Emulation Switchfeature. You cannot perform a DOS Print Screen in the PostScript mode.

FEATURE PRINT

You can use this Level 2 option to print out the printer's features to check whether your printer is working correctly.

Menu/submenu		Available options
♦ **FEATURE PRINT**	▶	▶ **PRINT**

Press ▶ to print out the feature page.

After you print the feature print, SelecType Level settings return to their defaults and the printer clears its memory, including any downloaded font data.

FONT

This Level 1 option selects one of the fonts available in the current printer emulation. See Appendixes B and C in this *Reference Guide* for information on the printer emulation you are using.

FONT SAMPLE

This Level 1 option prints a sample of the fonts available for your selected printer emulation. The portrait fonts and landscape fonts are printed on different pages. Press ▶ twice to print the font sample.

Menu/submenu		Available options
♦ **FONT SAMPLE**	▶	▶ **PRINT**

FULL PRINT

This Level 1 option is a submenu of SYSTEM CONFIG. The default setting of 0 is sufficient for most uses of the printer. If the printer displays the message S **ET F U L L P RI NT,** increase this setting. The setting (any number from 0 through 62) times 20 is the number of kilobytes (KB) reserved in RAM for page composition. For example, a setting of 5 reserves 100KB.

Menu/submenu	Available options
♦ **FULL PRINT**	0 ▶ 0 to 62

The following table shows the maximum setting necessary for each size of paper. The setting may be lower than the maximum, but it will never need to be higher.

Paper Size	Setting	Paper Size	Setting
A4	51	GLG	57
A5	35	EXE	45
B5	43	F4	57
LT	47	MON	31
HLT	36	C10	41
LG	62	DL	37
GLT	45	C5	38

Since the amount of RAM you reserve with this option is not available for any other purpose, it is best to leave the setting at 0 until you see a **SET FULL PRINT** message. Then, increase the setting in small increments until the error does not occur.

If FULL PRINT is set to the maximum value, the printer does not display the **SET FULL PRINT** error. If an **INSUFF MEMORY** or **PAGE BUFFER FULL** message appears, you must install optional memory. See Chapter 5 for information on installing memory chip sets.

INPUT

This Level 1 option selects whether paper feeds into the printer from the standard paper bin or the optional lower paper cassette.

Menu/submenu				Available options
♦ **INPUT**	**AUTO**	**LT**	▶	**AUTO** **ST D** (Standard) **OPT** (Optional)

If you choose STD, the printer loads paper from the standard paper bin.

If you choose OPT, the printer loads paper from the optional lower paper cassette. OPT appears as an option on the display only if you install the optional lower paper cassette unit.

If you choose AUTO, the printer loads paper from the paper cassette containing the size of paper specified by the PAGE SIZE option. If both cassettes contain the specified paper size, the printer loads paper from the standard paper bin until it is empty, then switches to the lower paper cassette. You may print up to 400 sheets continuously.

If the paper in either the bin or the cassette does not match the paper size set with the PAGE SIZE option, the printer returns a paper size error. Correct the setting or load the correct size paper.

INTERFACE

This Level 2 option allows you to change settings for the built-in interfaces, parallel and serial. This option is not available for channel 0.

Menu/submenu	Available options
♦ **INTERFACE**	▶ **P** (Parallel) S (Serial) (ActionLaser 1500 only)

The PARALLEL option has these three submenus:

Menu/submenu	Available options
♦ **CH P CONFIG.**	▶ **SLCTIN** **AUTOFEED** **BUSY DELAY**

Normally, you do not need to change these settings. Change them only when you have special requirements.

SLCT-IN-When you set SLCT-IN to OFF, the printer is continuously selected and ignores device control codes DC1 and DC3. In almost all cases, leave SLCT-IN set to OFF. When SLCT-IN is ON, the SLCT-IN signal goes HIGH at power-on and the control codes DC1 and DC3 are valid.

Menu/submenu	Available options
♦ **SLCT-IN**	**OFF** ▶ **ON** or **OFF**

AUTOFEED-When you set AUTOFEED to OFF, the printer ignores the AUTOFEED signal on pin 14 and does not send an automatic line feed (LF) command with each carriage return (CR). When you set AUTOFEED to ON, the printer adds a line feed to each carriage return it receives. If your text lines overprint each other, set AUTOFEED to ON.

Menu/submenu	Available options
♦ **AUTOFEED**	**OFF** ▶ **ON** or **OFF**

BUSY DELAY-Use BUSY DELAY to set the delay period from the ACKNLG to the BUSY signal. Available settings are 0, -5, and +5 microseconds plus MIN. The MIN option sets the ACKNLG signal to high.

Menu/submenu		Available options
♦ **BUSY DELAY**	**0** ▶	**-5, 0, +5,** or **MIN**

The SERIAL option has these nine submenus:

Menu/submenu		Available options
♦ **CH S CONFIG.**	▶	**WORD LENGTH** **BAUDRATE** **PARITY** **STOP BIT** **DTR** **XON/XOFF** **ENQ/ACK** **DSR** **CTS**

These settings must match the settings your computer is using. Check your computer's manual.

WORD LENGTH-You can select 8-bit word length or 7-bit word length. See your computer manual and software documentation for the proper setting. The factory setting is &bit.

Menu/submenu		Available options
♦ **WORD LENGTH**	8 ▶	7 or 8

BAUDRATE-Use this option to set the data transfer rate (baud) for the serial interface. The baud rate is measured in bits per second (bps). See your computer manual and software documentation for the proper setting. The factory setting is 9600.

Menu/submenu			Available options
♦ **BAUDRATE**	**9600**	▶	300 600 1200 2400 4800 9600 **19200** 38400

PARITY-When this option is set to NONE, parity checking is disabled. The parity bit, if used, provides a basic form of error detection. See your computer manual and software documentation for the proper setting.

Menu/submenu			Available options
♦ **PARITY**	**NONE**	▶	**NONE** **EVEN** **ODD**

STOP BIT-Use this option to set the number of stop bits on each character of information sent to the printer. Stop bits signal the end of a character.

Menu/submenu			Available options
♦ **STOP BIT**	2	▶	1 or 2

DTR-Use this option to turn the printer's ready communications protocol ON or OFF. You can use DTR (Data Terminal Ready) protocol in combination with the XON/XOFF option setting.

Menu/submenu	Available options
♦ **DTR**	**ON** ▶ **ON** or **OFF**

XON/XOFF-Use this option to turn the XON/XOFF communications protocol on or off. You can use XON/XOFF protocol in combination with the DTR option setting.

Menu/submenu	Available options
♦ **XON/XOFF** **ON**	▶ **ON** or **OFF**

ENQ/ACK-This option is available in the Epson GL emulation only. If you are using another printer emulation, leave this option set to OFF.

Menu/submenu	Available options
♦ **ENQ/ACK**	**OFF** ▶ **ON** or **OFF**

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

Menu/submenu	Available options
♦ **DSR**	**OFF** ▶ **ON** or **OFF**

CTS-When CTS (Clear To Send) is OFF, the signal level is permanently set HIGH. The factory setting is OFF (signal level is HIGH). This setting should be set to OFF for most communications purposes. When CTS is ON, data is sent to the computer only when CTS is HIGH.

Menu/submenu		Available options
♦ **CTS**	**OFF**	▶ **ON** or **OFF**

LANG.

Use this Level 2 option to select the language used in the status and error display messages. This manual describes all status and error messages in English only.

Menu/submenu		Available options
♦ **LANG.**	**ENGLISH**	▶ **ENGLISH** **DEUTSCH** **ITALIANO** **ESPANOL** **FRANCAIS**

MACRO

These Level 1 options are found on the SYSTEM CONFIG. submenu.

SAVE MACRO-Use this option to save the current Level 1 settings as a macro and recall them anytime. You can save up to four macros using the numbers 1 through 4. When you press ▶ , the following appears on the display:

Menu/submenu	Available options
SAVE MACRO →1	▶ **EXE 1 to 4**

Select a macro number for your setting by pressing ▲ or ▼. Then press ▶ to save the current SelecType Level 1 settings into the macro. Next use the PowerOn MACRO option, described later in this MACRO section, to choose the same number as chosen in SAVE MACRO. These settings will be in effect each time you turn the printer on.

Press ◀ to exit this submenu without saving a macro.

CAUTION:
Do not turn off the printer while it is saving the macro. If you do, you may see a ***START UP ERROR*** *message the next time you turn the printer on.*

You can save up to four different settings for each emulation except PostScript.

LOAD MACRO-Use this option to load one of the macros you created using the SAVE MACRO option. The factory setting is 1. When you press ▶, the following appears on the display:

Menu/submenu	Available options
LOADMACRO →1▶	**EXE 0 to 4**

Press ▲ or ▼ to choose the number of the macro you want to use. Then press ▶ to load the selected macro. Whenever you select macro 0, all Level 1 settings return to their factory settings. Press 4 to exit this submenu without loading a macro.

Note:
You can create customized Level 1 settings (macros) and save them in the printer. The printer can memorize up to four series of macros for each emulation. If you change the Level 1 settings and save them to one of the macros in advance, you can later use your customized macros whenever you load the corresponding macro number.

DELETE MACRO-Use this option to delete any macros you create. When you press ▶, the display shows the following:

Menu/submenu	Available options
DELETE MACRO →1 ▶ EXE	**1** to 4

Select the number of the macro you want to delete by pressing ▲ or ▼. Then press ▶ to delete the macro. The printer deletes all settings saved with the specified macro.

Press ◀ to return to the main menu without deleting a macro.

PowerOn MACRO-Use this option to specify the macro number you want to use as the power-on default for each printer emulation. Each time you turn the printer on, the macro you set with this option takes effect. Select macro 0 to use the factory default settings.

Menu/submenu	Available options
PowerOn MACRO →0 ▶ EXE	**0 to 4**

MEMORY LEFT

This Level 1 option is found on the SYSTEM CONFIG. submenu. Use this option to display the amount of memory available. You can use this information to see whether a newly installed memory option is working correctly or to see how much memory is available for fonts or complex graphics.

OFFSET

These Level 1 options are found on the SYSTEM CONFIG. submenu.

T-OFFSET-You can use the T-OFFSET (top offset) option to make fine adjustments in the position of the printing on the page. The setting is in dots; each dot is 1/300th of an inch (0.0846 mm) so you can use this option to raise or lower the printing on the page up to approximately 1/5th of an inch (5 mm). The factory setting is 0.

Menu/submenu			Available options
♦ **T-OFFSET**	**0**	▶	*-64* to +63

L-OFFSET-You can use the L-OFFSET (left offset) option to make fine adjustments in the position of the printing on the page. The setting is in dots; each dot is 1/300th of an inch (0.0846 mm). With this option, you can move the printing on the page approximately 1/5th of an inch to the left (settings from -1 to -64) or to the right (settings from +1 to +63). The factory setting is 0.

Menu/submenu			Available options
♦ **L-OFFSET**	**0**	▶	*-64* to +63

ORIENT.

This Level 1 option selects the direction in which the characters are printed on a page. The ORIENT. option is different for each printer emulation. See Appendixes B and C for information on the different printer emulations.

PAGE COUNTER

This Level 2 option displays the number of sheets printed since the printer was installed.

PAGE SIZE

This Level 1 option specifies the size of paper. Do not use this option unless you cannot change paper size with your application software.

Menu/submenu		Available options
♦ **PAGE SIZE**	**LT** ▶	**A4** **A5** **B5** **LT (Letter)** **HLT (Half Letter)** **LGL (Legal)** **GLT** (Government letter) **GLG** (Government legal) **EXE** (Executive) **F4** **MON** (Monarch) **C10 (Commercial** 10) **DL** *C5*

RITech

This Level 2 option, Resolution Improvement Technology (RITech), is available only with a printer equipped with HPIII emulation (3/P/Si). RITech produces smoother and crisper lines, text, and graphics. You will probably not have to change the factory setting, which is MEDIUM. If you change the RITech setting, you can check the print quality by printing a sample status sheet. See Chapter 1 for full information on RITech.

Menu/submenu		Available options
♦ **RITECH**	**MEDIUM** ▶	**LIGHT**
		MEDIUM
		HEAVY
		OFF

RX-BUFFER SIZE

The receive buffer option on Level 2 allows you to change the size of the printer's input buffer. A large receive buffer size allows you to quickly transfer the contents of a file from the computer's memory to the printer's memory. The printer then prints the information from its own memory and frees up the computer for other tasks.

If you set the buffer size too high, however, you may get an error message telling you to add memory.

When you press ▶, the display reads as follows.

Menu/submenu		Available options
♦ **CH P**	**XK**	▶ **S,P,or O** (S for ActionLaser 1500 only)

(Where X is the RX-BUFFER SIZE setting.)

Press ▲ or ▼ to choose the interface channel for which you want to change the buffer size. Then press ▶ .

Menu/submenu			Available options
CH P	**→ XK**	**▶ SET**	See the following table.

The setting you can select for the RX-BUFFER SIZE varies depending on the amount of total RAM size in your printer. The table below shows the available settings for the buffer sizes. Y is the amount of RAM that the printer has, and X is the RX-BUFFER SIZE setting.

Total RAM YMB	**Available range (X)**
0.5 ≤ Y ≤ 2	1K to Y/5
2 ≤ Y ≤ 4	5K to Y/5
4 ≤ Y ≤ 6	10K to Y/5
6 ≤ Y ≤ 6.5	10K to Y/5

Press ▲ to increase the buffer size or ▼ to decrease it. Press the button briefly to change the value by its minimum increment or hold the button down to change the value rapidly.

After changing the buffer size, you need to execute INITIALIZE for the new setting to take effect. Press ▶ to execute or ◀ to cancel the initialize operation.

Menu/submenu			Available options
CAN	**◀ INITIALIZE**	**▶ EXE**	◀ (cancel) or ▶ (execute)

Note:
You can also save the setting by exiting Level 2 and then initializing the printer. See "Buttons" in Chapter 1 for more information.

STANDBY

This Level 2 option saves power by reducing the power to the fusing heater whenever no data is sent to the printer for 30 minutes. In this mode, the printer begins warming up as soon as you press the ON LINE button or send any data; it becomes ready to print within 35 seconds. The default is DISABLE, which keeps the printer warmed up and ready to print at all times.

Menu/submenu	Available options
♦ **STANDBY DISABLE**	▶ **ENABLE** **DISABLE**

STATUS SHEET

This Level 1 option prints a status sheet that lists the current printer settings. When you reach this option, press ▶ twice to print the status sheet.

Menu/submenu	Available options
♦ **STATUS SHEET** ▶	▶ **PRINT**

If you want the status sheet to reflect a macro, first load the macro using the LOAD MACRO option in Level 1 SYSTEM CONFIG. Then print the status sheet.

SUB CONFIG.

The submenu for the Level 1 SUB CONFIG. option is different in each printer emulation. It controls such features as symbol set and number of text lines. See Appendixes B and C in this Reference Guide for information on the printer emulation you are using.

SYSTEM CONFIG.

This Level 1 option includes the following eight submenus:

Menu/submenu	Available options
♦ **SYSTEM CONFIG.**	▶ **FULL PRINT** **T-OFFSET** **L-OFFSET** **MEMORY LEFT** **LOAD MACRO** **SAVE MACRO** **DELETE MACRO** **PowerOn MACRO**

See descriptions for FULL PRINT, OFFSET, MACRO, and MEMORY LEFT in this chapter.

TONER

Use this Level 2 option to display the amount of toner left in the imaging cartridge and to reset the toner setting (the number of asterisks between the E and F) after you install a new imaging cartridge.

Menu/submenu	Available options
♦ **TONER E*****F**	▶ **NEW (New** cartridge) **E*****F*** (100-80%) **E****F (80-60%)** **E***F (6040%)** **E** F (40-20%)** **E*F (20-0%)**

When you check TONER because your printed images become faint and the message shows only 1 asterisk, you must change your imaging cartridge. See “Replacing the Imaging Cartridge” in the *Setup and Maintenance* guide.

If you are installing an imaging cartridge with a 6000-page life span (the standard cartridge), set this option to **NEW.**

When you want to use an imaging cartridge whose life span is different from the original cartridge's span (6000 pages), you can set the appropriate toner amount setting in terms of pages. When the display shows **NEW,** press ▶.

Menu/submenu			Available options
LIFE	**➔ 6000**	**▶ SET**	**5000 to 9000 (in 1000 page increments)**

Then press ▼ until you reach the desired page range. Press ▶ to set the page range.

USER

Note:
You do not need to change this setting if you are using only one computer. If you are using more than one computer with your printer, see "Sharing Your Printer" in Chapter I.

The USER option on Level 2 gives you the choice of two settings to specify how the printer's memory is used, AUTOSENSE or INDIVIDUAL.

With AUTOSENSE the printer automatically detects which interface channel (parallel, serial, or optional) is receiving data and allocates all of the printer's available memory to that channel.

With INDIVIDUAL mode, a separate area of memory is defined for each channel. If you define more than two channels with the INDIVIDUAL setting or if you use one of the optional identity cards with either mode, you have to add more memory. See Chapter 5, "Options," in this manual for information on adding memory.

AUTOSENSE is less complicated and requires less total memory, but in the unlikely event that files sent from two different computers at the same time interfere with each other, try the INDIVIDUAL setting.

Using AUTOSENSE

Menu/submenu	Available options
USER →AUTOSENSE ▶ SET AUTOSENSE	**INDIVIDUAL**

Press ▲ or ▼ to choose AUTOSENSE or INDIVIDUAL. New settings for the USER option take effect only when exit SelecType and then use the INITIALIZE button. See "Buttons," in Chapter 1.

Assigning memory in /ND/V/DUAL mode

If you select INDIVIDUAL, the next step is assigning memory to each channel. Any channel using the LJ-2P, 3/P/Si, LQ, FX, or GL/2 printer emulation requires at least 0.5MB of memory, and any channel using the PostScript or Epson GL identity card requires at least 1.5MB. (Add the requirements of all three channels together to determine the minimum total memory required. If you need to add memory, see "The Memory Chip Sets," in Chapter 5.)

You assign the memory using a value from 0 to 9 for each channel. The factory setting is S:0 P:1 O:0. For example: if you have an ActionLaser 1500 and you are using PostScript in the S channel, HP 3/P/Si in the P channel, and nothing in the O channel, you might assign the proportion as S:3 P:1 O:0 because PostScript requires approximately three times as much memory as HP 3/P/Si.

After choosing INDIVIDUAL, press ▶ to move to the following display:

Menu/submenu	Available options
0.5M →S:0 P:1 O:0 ▶ SET	**P: 0-9** **S: 0-9 (ActionLaser 1500 only)** **O: 0-9**

The number on the left is the total number of megabytes available (ActionLaser 1000 has 0.5M and the ActionLaser 1500 has 1.0M standard), and the number to the right of each channel is the proportion of memory allocated to that channel. Use the arrow buttons to assign a new value from 0 to 9 to one or more channels.

After you finish the memory allocation, press ▶ . The display shows the following:

Menu/submenu	Available options
CAN ◀ INITIALIZE ▶ EXE	◀ (cancel) or ▶ (execute)

Press ▶ to save the settings and restart the printer or press ◀ to cancel the settings.

Note:
You can also save the settings by pressing EXIT to exit Level 2 and then initializing the printer as explained in Chapter 1.

VERSION

This Level 2 option displays the version number of the printer's controller and font. Press ▶ to see the C-ROM1 version number, and then press ▲ or ▼ to see the C-ROM2 or FONT version number. (The C-ROM2 option is available only on the ActionLaser 1500.)

Menu/submenu	Available options
♦ **VERSION**	▶ **C-ROM1** **C-ROM2** **FONT**

Chapter 5

Options

5

What's Available

Many options are available to enhance the use of your ActionLaser 1000 or ActionLaser 1500. Your dealer has the most recent information on available options.

Epson PostScript card (C82605)*

The Epson PostScript card allows you to use your printer as a PostScript printer. You can then use PostScript fonts built into this card as well as the numerous download fonts available for PostScript printers.

Epson GL Identity card (C82602")

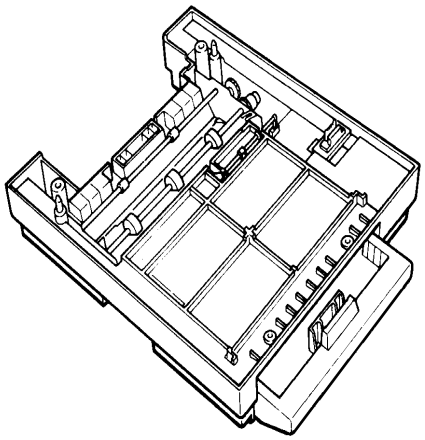
If you have an ActionLaser 1000 with the optional PCL5/RITech board installed, the Epson GL identity card allows you to use your printer in the Epson GL emulation.

Face-up output tray (C81231)*

To feed single sheets of paper types such as envelopes, transparencies, labels, or heavy paper, use the face-up output tray. The face-up feed method reduces curling of such paper types and the tray catches the paper at the paper ejection area at the top back of the printer.

Lower paper cassette unit (C81230)*

The optional lower paper cassette unit allows you to feed up to an additional 250 sheets of letter size paper into your printer.



Optional interface boards

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

Buffered Serial Interface (C823071)
Buffered Parallel Interface (C823101)

To add a direct connection to IBM mini and mainframe systems, use one of the following:

Twinax Interface Board (C823151)
Coax Interface Board (C823141)

In addition to the twinax or coax connector, these two interfaces contain a parallel interface. Since the printer's built-in interfaces remain active, this gives you two parallel and a twinax or coax connector on the ActionLaser 1000 and two parallel, one serial, and a twinax or coax on the ActionLaser 1500. Print jobs can be sent to any connection, and the printer automatically switches between the active ports.

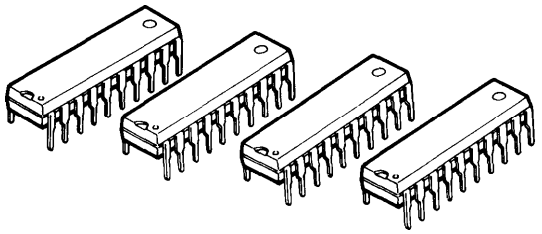
The twinax interface is compatible with the following IBM systems: AS-400, System 36,525l (model 12), System 34, System 38, and 5294. When equipped with the Epson twinax interface, an ActionLaser can be used in place of the following IBM system printers: 4210,5224 (model 1 and 2), 5256 (model 1, 2, and 3), 3218 (non IPDS), 4214 (model 2), 5225 (model 1,2,3, and 4), and 5219 D0l, D02.

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

Memory chips sets

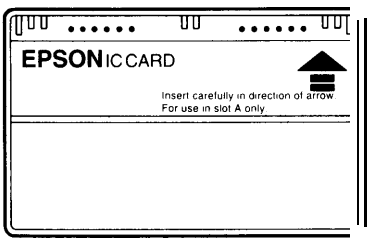
0.5MB memory chip set (C82904*)
2.0MB memory chip set (C82905*)

You can increase your printer's current memory by adding memory chip sets to your printer's controller board. Each set of RAM chips increases the printer memory by increments of 0.5MB or 2.0MB. For the ActionLaser 1000, you may install up to 6.0MB of additional memory. For the ActionLaser 1500, you may install up to 4.0MB of additional memory.



Identity Cards

An identity card allows you to operate your printer in an optional printer emulation.



Note:
You cannot use identity cards #5690 and #5691 with this printer. You can also use optional font cards in slot A.

Epson PostCript card

Follow these guidelines when using the optional Epson PostScript identity card.

- The PostScript emulation requires at least 1.5 megabytes (MB) of RAM. This means you need to add at least 1.0MB RAM to an ActionLaser 1000 or 0.5MB RAM to an ActionLaser 1500 before you can use PostScript. See "The Memory Chip Sets" later in this chapter.

- You must select PostScript (PS) emulation with the SelecType Level 2 EMULATION setting. You can select the PS emulation for one channel at a time only.

- If you are using legal-size paper, you may find that the printable area is smaller than you expect. To clear this problem, decrease the RX-BUFFER SIZE option in SelecType or increase the available RAM. See the discussion of RX-BUFFER SIZE in Chapter 4, "SelecType," or see "The Memory Chip Sets" later in this chapter.

- If you set EMULATION to one of the Intelligent Emulation Switch (IES) settings, be sure to turn off the start page printing feature in PostScript. If both the IES feature and the start page printing feature are on, the printer prints the start page each time it switches from HP emulation to PostScript.

Epson GL identity card

Follow these guidelines when using the optional Epson GL identity card.

- The GL emulation requires at least 1.5 megabytes (MB) of RAM. This means you need to add at least 1.0MB RAM to an ActionLaser 1000 or 0.5MB RAM to an ActionLaser 1500 before you can use GL emulation. See "The Memory Chip Sets" later in this chapter.

- The printer ignores device control commands from optional interfaces even if the interface is serial. Use the printer's serial interface to enable the additional device control commands. (If you have an ActionLaser 1000, use your parallel interface.)

- ❑ The following restrictions apply when running the Epson GL emulation using Channel S with the SelecType Level 2 USER option, AUTOSENSE setting (applies to ActionLaser 1500 users only):

  1. The power-on default channel becomes Channel S.

  2. Channel S cannot receive any data when another channel is receiving data.

  3. You can select Channel S only when the FEED light is off.

- ❑ The maximum number of copies you can choose in SelecType is 99.

Caring for cards

When you use the cards. follow these precautions:

- ❑ Do not drop, crush, or bend the cards. The card's natural curvature does not affect its operation; do not try to straighten it.

- ❑ Avoid touching the small gold connectors (contacts) along the card's edge.

- ❑ If the card becomes dirty, clean the connectors by wiping the edge with a clean tissue. Do not use water, alcohol, or other solvents to clean it.

- ❑ Keep the cards in their slip cases and blue antistatic bags when you are not using them.

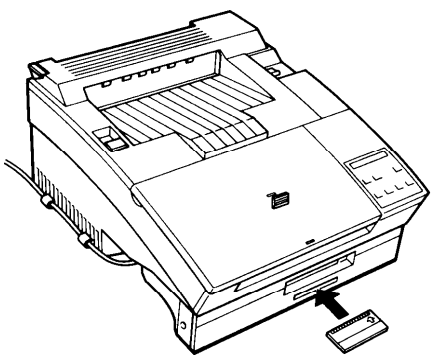
- ❑ Do not store cards in direct sunlight or near heat sources. They can withstand temperatures ranging from -30°C to 65°C (-29°F to 150°F) and up to 90% humidity.

- ❑ Be careful when inserting a card. You can damage it by inserting it the wrong way or by using too much force.
- ❑ Always turn the printer off before you insert or remove a card.
- ❑ Always remove the card before you remove the controller board.

Inserting a card

You can insert an identity card into slot A only.

1. If you use an identity card, turn off the printer. If you use a font card, set the printer off line. (If the FEED light is on, press FEED to print out any data before you insert the card.)
2. Hold the card so that the arrow is on top and points toward the slot.



3. Gently slide the card into the slot until it is flush with the front of the printer.

CAUTION:
If the message ***REMOVE CARD*** *appears on the display, you inserted the card when the printer was on line or when the printer's memory contained data. Remove the card, press* CONTINUE, *then return to step 1.*

4. If the power is on, press ON LINE to set the printer on line. If the power is off, turn on the printer.

CAUTION:
If the message ***ILLEGAL CARD*** *appears on the display, repeat steps 1 through 4.*

If you are using an identity card, you can select the emulation that the card offers. See the card's manual for more information.

If you are using a font card, see Appendixes B and C for information on selecting fonts.

Removing a card

1. If you are using an identity card, turn off the printer. If you are using a font card, set the printer off line. (If the FEED light is on, press FEED to print out any data before you remove the card.)

CAUTION:
Never **remove** *an identity card when the printer's power is on.*

2. Grasp the card at the center and gently pull it straight out of the slot.

Recovering from an error

When the display shows one of the following messages, a card error has occurred:

REINSERT CARD
ILLEGAL CARD
REMOVE CARD
CARD MEMORY OVERFLOW

See "Messages" in Chapter 3 for instructions on solving the problem.

Font Cartridges

The table below lists all font cartridges that you can use with the printer. Some of these fonts may be the same as your printer's fonts. See Appendixes B and C for a list of the fonts and character sets available in each printer emulation.

Note:
You can use *font* cartridges *only in HP* emulation. To *change the printer emulation, use the SelecType Level 2 EMULATION option* described *in Chapter 4.*

Bitmap font cartridges

Supplier	Cartridge number	Cartridge
HP	92286A	Courier 1
	92286B	Tms Proportional 1
	92286C	International 1
	92286D	Prestige Elite
	92286E	Letter Gothic
	92286F	Tms Proportional 2
	92286G	Legal Elite
	92286H	Legal Courier
	92286J	Math Elite

Bitmap font cartridges (continued)

Supplier	Cartridge number	Cartridge
HP (continued)	92286K	Math TmsRmn
	92286L	Courier P&L
	92286M	Prestige Elite P&L
	92286N	Letter Gothic P&L
	92286P	TmsRmn P&L
	92286Q	Memo 1
	92286R	Presentations 1
	92286T	Tax 1
	92286U	Forms Portrait
	92286V	Forms Landscape
	92286W	Bar Code 3-of-9/OCR A
	92286X	EAN/UPC/OCR-B
	92286Y	PC Courier 1
	92286Z	Microsoft 1
	92290S1	Courier Document 1
	92290S2	Tms Rmn/Helv Report 1
	92286PC	ProCollection
	92286IC	International Collection
	C2055A	#C01 Great Start
	C2053A	#C01 WordPerfect
	C2053A	XC02 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
Anacom		AlfaJet MX-1 Maxi-One Cartridge AlfaJet PC Maxi-Pro Cartridge
Peripherals		Jet Font SuperSet JetFont 12/30 JetFont 4-in-1 JetFont SuperSet International JetFont 425-in-One SuperSet Plus

Bitmap font cartridges (continued)

Supplier	Cartridge number	Cartridge
Everex		HardFont Cartridge B HardFont Cartridge F HardFont Cartridge T HardFont Cartridge Z HardFont Cartridge LGL HardFont Cartridge SST HardFont Cartridge BST HardFont Cartridge All-in-1 HardFont Cartridge A-TO-Z
IQ		Super Cartridge 1 Super Cartridge 2 Super Cartridge 2L Super Cartridge 2LC Super Cartridge 2WP Super Cartridge 2XP Super Cartridge 2LS Series II Package
Pacific		25 Cartridge in One Original Version 25 Cartridge in One 172 25 in One! III Headlines in a Cartridge
UDP		DT1-TMS RMN DT2-HELV DP4-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 C1 Spreadsheets C3 Presentation Plus C4 Forms C5 Bar Codes C6 Equations C7 Global C8

Bitmap font cartridges (continued)

Supplier	Cartridge number	Cartridge
Intercon		PHONT+ PRO IIP
Bitstream	CTG-A001	TYPE CITY STARTER PACK, DELI ADD-ON CARD
	MOD-A001	CENTAL PARK ADD-ON CARD
	MOD-A002	SKYSCRAPER ADD-ON CARD
	MOD-A003	SOHO 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

Scalable font cartridges

Supplier	Cartridge number	Cartridge
HP	C2050B C2050C	#C80/C90 #C80/C90 WordPerfect
Pacific		Pacific Outlines I Pacific Outlines II COMPLETE FONT LIBRARY CARTRIDGE

You can use scalable font cartridges on the ActionLaser 1500 or on an upgraded ActionLaser 1000. See "Optional Boards" later in this chapter.

CAUTION:
Do not use any other HP font cartridges with your printer, or you my damage it.

Inserting a font cartridge

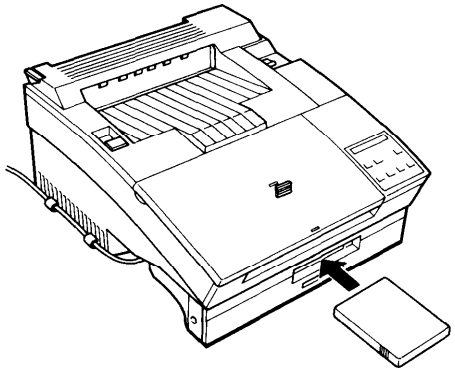
Insert font cartridges into slot C, which is located on the front of the printer.

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 FEED light off.

2. Hold the cartridge so its label faces 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.

CAUTION:
If the message ***REMOVE CARD appears*** *on the display, you inserted the cartridge when the printer was on line or when its memory contained data. If you see this message, remove the cartridge and press CONTINUE; then repeat steps 1 through 4.*

Selecting fonts

Once you have inserted a font cartridge, you **can** select the fonts you want to print using your application program.

Removing a 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*** *or* ***REMOVE CARD*** *message appears on the display. You will also see one of these messages if you remove a cartridge while the FEED light is* on *(even if the printer is off line).*

1. Make sure the printer is off line or turned off. If the FEED light is on, press FEED 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.

Recovering from an error

When the display shows one of the following messages, a cartridge error has occurred:

REINSERT CARD
ILLEGAL CARD
REMOVE CARD

You cannot use **the** cartridge or print documents until you solve the problem. See "Messages" in Chapter 3 for instructions.

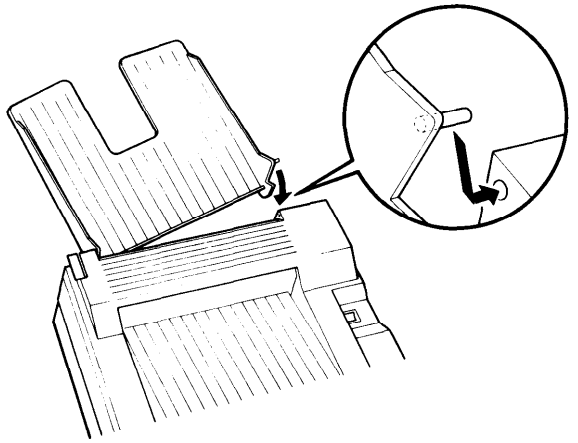
The Face-up Output *Tray*

The printer normally delivers paper face down on top of the printer. The optional face-up paper tray is recommended for print jobs of twenty pages or less and when:

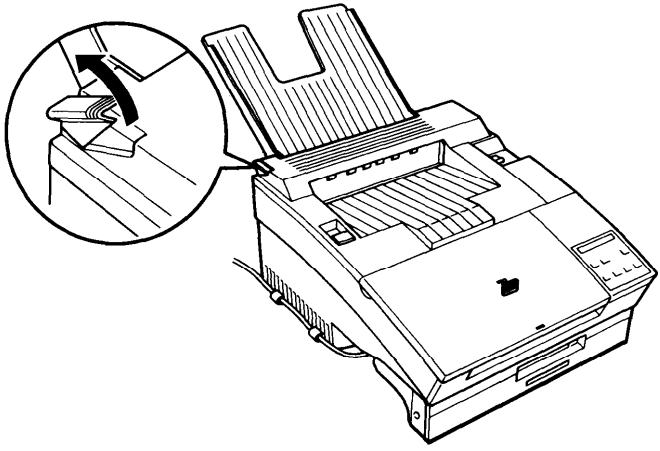
- ❑ you feed single-sheet items such as envelopes, transparencies, heavy paper, or labels through your printer.
- ❑ you prefer your printed sheets feed from the printer with the text facing you.

Installing the face-up output tray

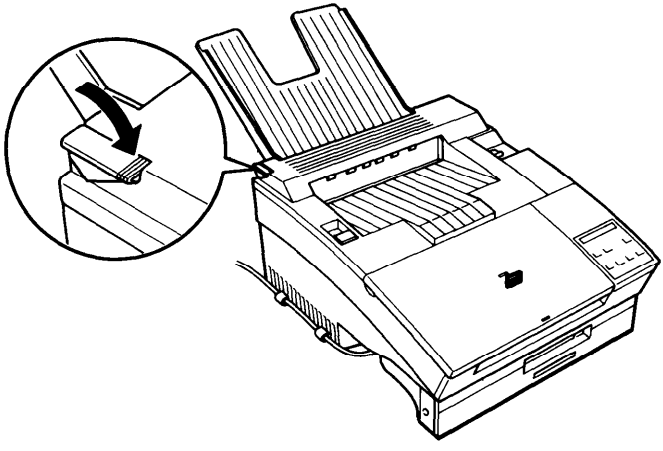
1. Hold the output tray tilted at a slight angle away from you. Then insert it into the back of the printer by placing the pins on the bottom side comers of the tray into the holes on each side of the paper ejection slot one at a time as shown below.



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



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



The Lower Paper Cassette Unit

The optional lower paper cassette unit provides automatic feeding of many types of paper. It holds up to 250 sheets of paper to supplement the standard paper bin's 150-sheet capacity.

You can load two different sizes of paper in your printer at once (one size in the lower paper cassette and the other in your standard paper bin). You can also use both the lower paper cassette and the standard paper bin for continuous printing of up to 400 sheets of the same size paper.

Installing the lower paper cassette unit

Note:
If you purchased your printer and your lower paper cassette unit at the same time, set up your printer and run the print test by following the instructions in the Setup and Maintenance *guide before you install the lower paper cassette unit.*

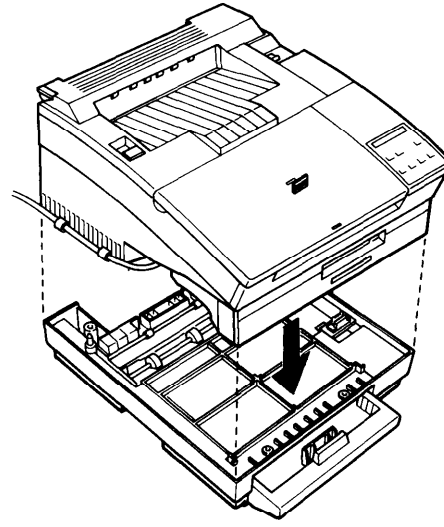
1. Turn off the printer. Unplug the printer's power cord from the electrical outlet and from the printer.

2. Remove the optional face-up output tray, if installed.

3. Move the printer to one side. Then set the lower cassette unit where your printer normally rests keeping the paper cassette facing you.

   Note:
   When lowering the printer, be sure the interface cable is not pinched between the printer and the lower paper cassette unit.

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



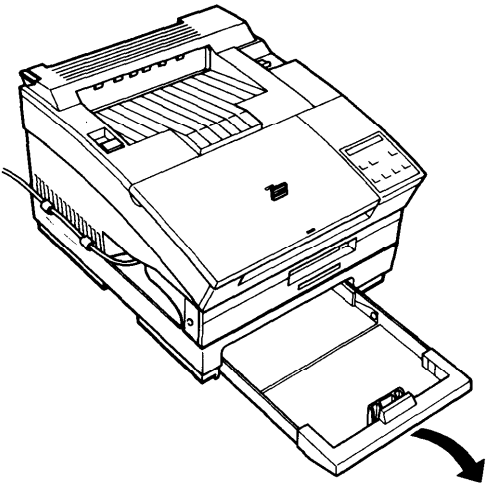
Note:
The printer is heavy, so you may need to have someone help you lift it.

5. Reconnect the power cord to the printer and plug it into an electrical outlet.

6. Turn on the printer.

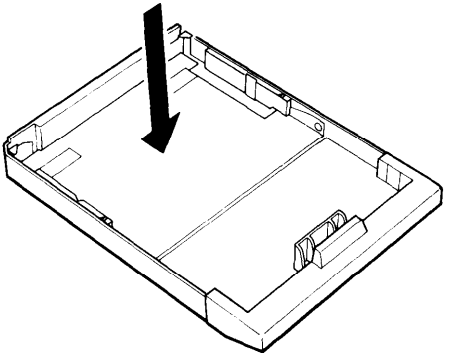
Using the lower paper cassette

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

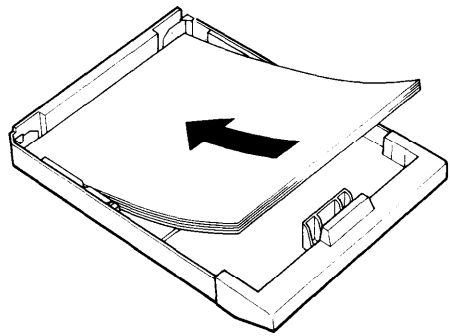


2. Take a stack of paper and fan it thoroughly.

3. Press down on the plate in the cassette until it clicks.

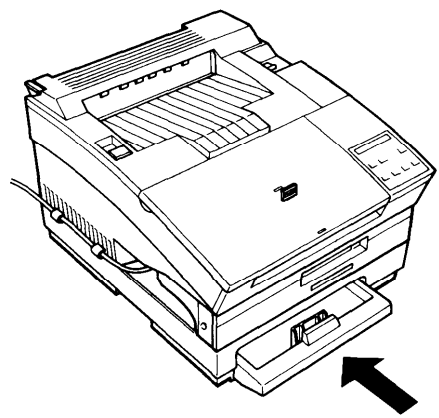


4. Insert a stack of paper face-up into the cassette with the corners of the paper beneath the two tabs at the back of the paper cassette.



Note:
Do not load paper above the marks on the cassette.

5. Insert the paper cassette into the front of the slot of the lower paper cassette unit and push it firmly into place.



To feed paper automatically from the lower paper cassette, remove all paper from the standard paper bin or change the paper source and paper size, if necessary, with your application software.

If you cannot change the paper source or paper size with your application software, see INPUT or PAGE SIZE in Chapter 4, "SelecType."

Optional Interface Boards

You can use one of the following optional interface boards. To see if other types of interface boards are available, contact your Epson dealer.

Buffered Serial Interface (C823071)
Buffered Parallel Interface (C823101)
Twinax Interface Board (C823151)
Coax Interface Board (C823141)

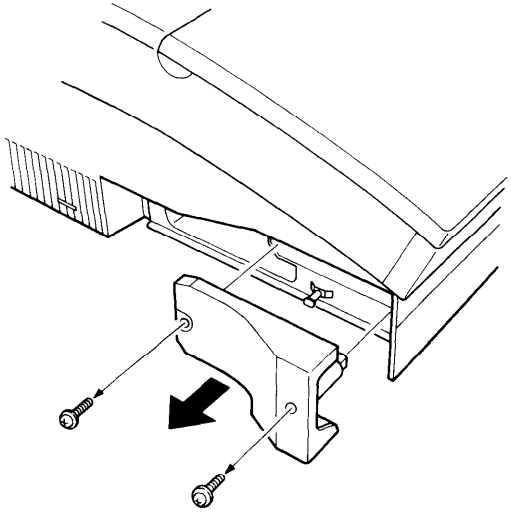
Installing an inferface board

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

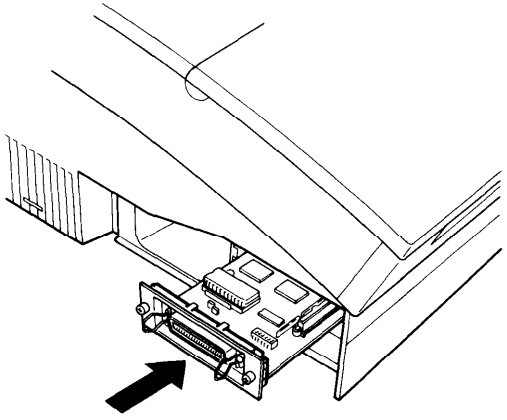
1. Turn off the printer. Unplug the power cord from both the electrical outlet and the back of the printer.

2. Turn the printer so that its left side is facing you.

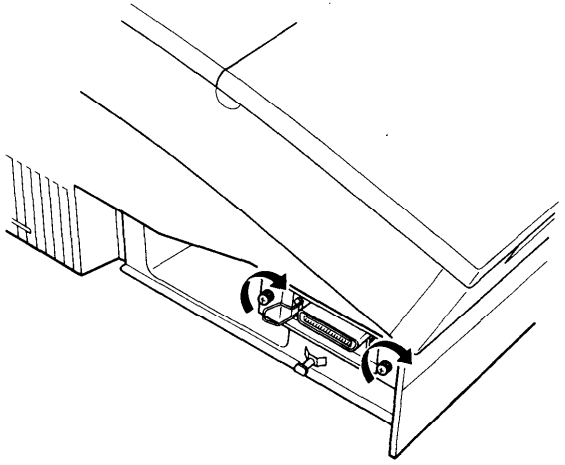
3. Remove the two screws that secure the interface board cover and remove the cover.



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

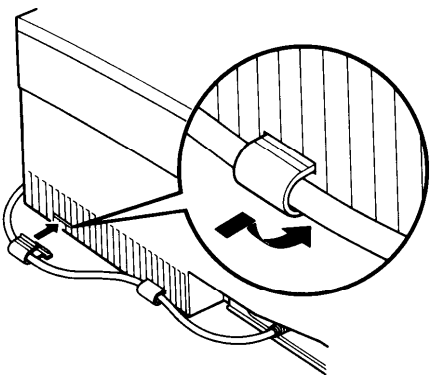


5. Secure the interface board in the slot with the two screws included with the interface board.



6. Connect the proper interface cable to the interface card and to your computer. Also, connect other interface cables if you are using more than one computer with your printer. *See* the *Setup and Maintenance* guide for assistance.

7. Insert the interface cable(s) 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.



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 board, you may need to change the printer emulation and the interface option using SelecType. If your optional interface is parallel and you want to use HP emulation with it, you do not have to change any settings. For settings information, see Chapter 4, "SelecType."

Installing the PCL5/RITech upgrade board

The PCL5/RITech upgrade board allows you to make an Action Laser 1000 act like an Action Laser 1500. This board is not available in the United States.

To install the optional upgrade board, you need a cross-head screwdriver. First you must remove the controller board.

Removing the controller board

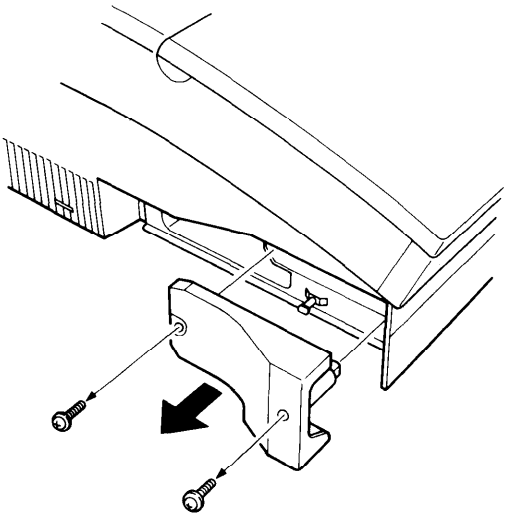
1. Turn off the printer and unplug the power cable from the electrical outlet.

2. Remove the optional card, cartridge, or lower paper cassette unit, if installed.

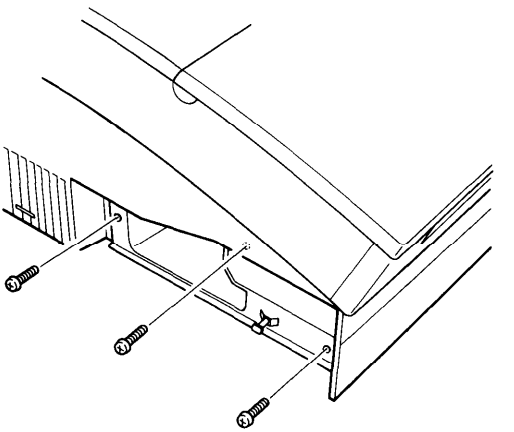
3. Turn the printer so that its left side is facing you.

4. Disconnect all interface cables from the interface connectors.

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.

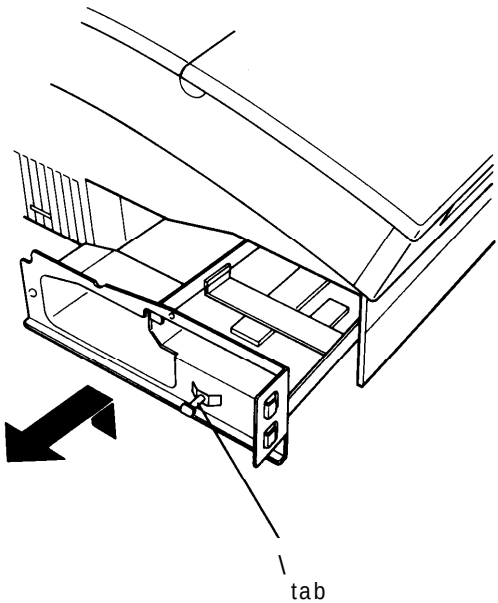


6. Remove the three silver screws that secure the metal bracket on the left side of the printer. Keep the screws handy so that you can use them later.

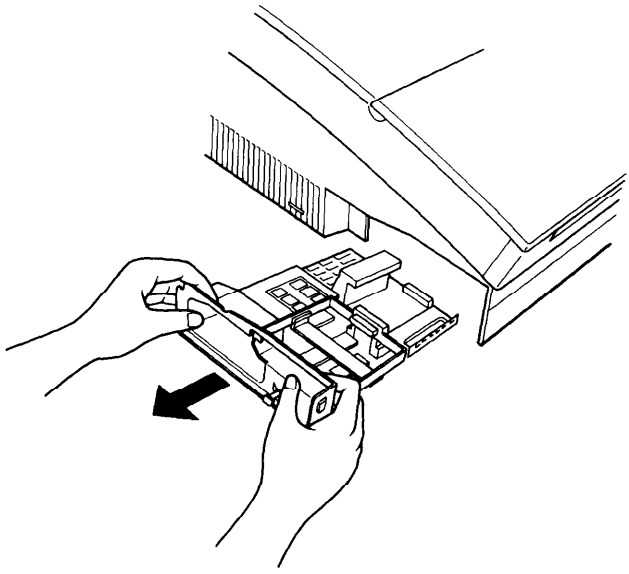


CAUTION:
Before you remove the controller board, make sure that you remove any optional cards or cartridges. Otherwise, you my damage them.

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



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

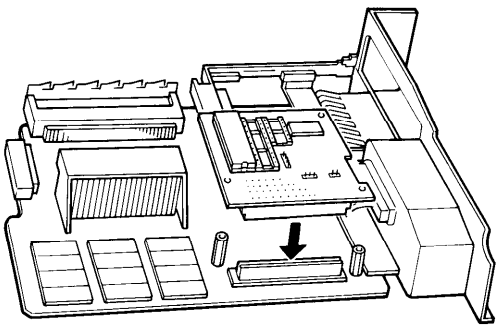


9. Set the controller board on a clean, flat surface with the bracket (connector) facing to your right.

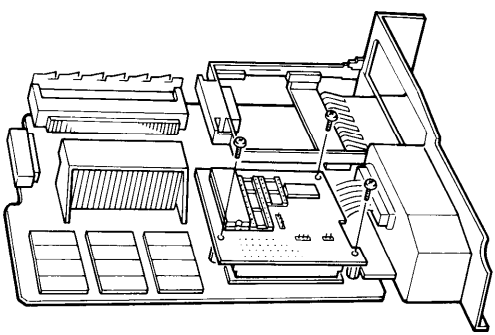
Inserting the upgrade board

The PCL5/RITech board is installed on the bottom right of the controller board.

1. Locate connector CN 3 on the controller board. Position the PCL5/RITech board as shown below, and carefully insert its connector into connector CN 3.

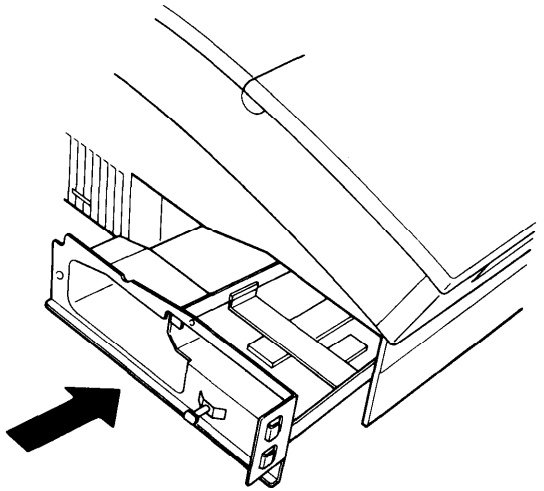


2. Secure the PCL5/RITech board with the three screws that came with it.



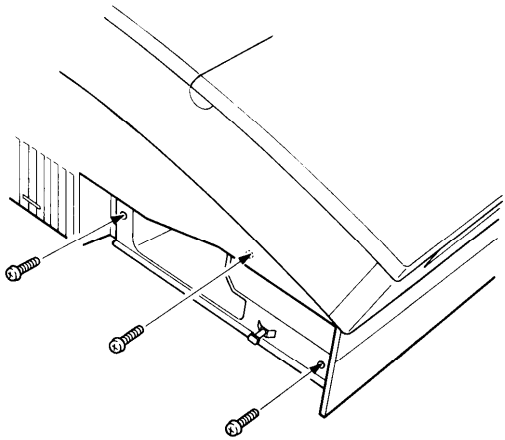
Reinstalling the controller board

1. Fit the right edge of the controller board into the right groove inside the slot of the printer. Then gently slide the board to fit its left edge into the left groove.

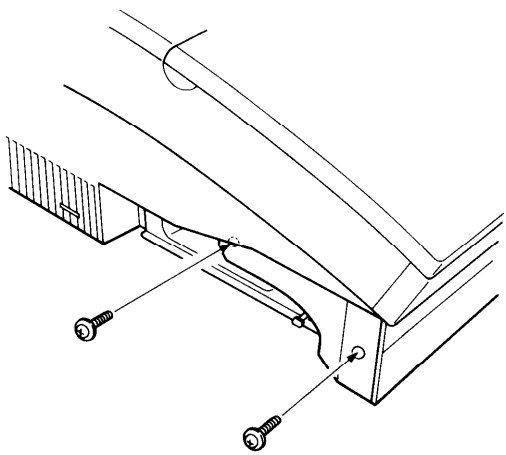


2. Slide the controller board into the printer. Press firmly on both sides of the bracket to lock the board into place. If the controller board does not fit smoothly into the printer, do not force it. Remove it and make sure the edges fit properly into the grooves inside the slot.

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



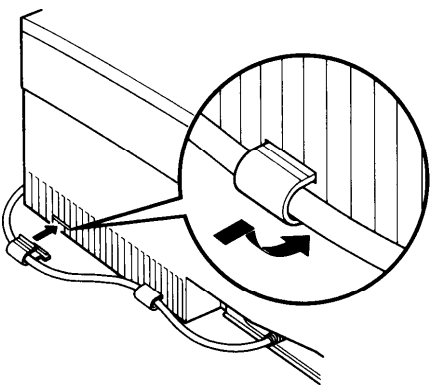
4. Fasten the interface board cover with the two screws you removed earlier.



Note:
You do not have to attach the interface board cover when the optional interface card is installed.

5. Connect any interface cables you removed.

6. Insert the interface cable(s) 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. Attach the panel sticker provided in the PCL5/RITech board package on the area above the printer's control panel display and press it in place.

8. Be sure the power is turned off and then plug the power cord into an electrical outlet.

Checking the installation

To verify that you installed the PCL5/RITech upgrade board properly, use the SelecType Level 1 EMULATION option. Enter SelecType Level 1 and choose the EMULATION option. Press ▲ or ▼ to see if 3/P/Si appears on the display. If it does not, turn off the printer and reinstall the PCL5/RITech board.

The Memory Chip Sets

If you are having difficulty printing complex, graphics-intensive pages or if you regularly use downloaded fonts, you may need to install the optional memory (RAM) chip sets on your printer's controller board. Your printer's controller board comes with either 0.5MB RAM installed (for the ActionLaser 1000) or 1.0MB RAM installed (for ActionLaser 1500). Two types of RAM chip sets are available.

0.5 MB RAM Chip Set
Each set contains four 256 Kbit x 480 ns DRAM 20-pin DIP chips

2.0 MB RAM Chip Set
Each set contains four 1 Mbit x 480 ns DRAM 20-pin DIP chips

By installing RAM chip sets, you can increase the printer's memory until it totals 6.5MB (for the ActionLaser 1000) or 5.0MB (for ActionLaser 1500), including the resident memory.

First decide on how much memory you wish to add, then install the RAM chips on the controller board. If you have questions about this process, contact your dealer.

When to increase your printer's memory

The printer displays one of these status messages when you have insufficient memory:

INSUFF MEMORY
PAGE BUFFER FULL
ADD MEMORY FOR CH X

These messages are described in more detail in Chapter 3.

You need to add memory if one of these messages appears and you are unable to resolve the memory problem as described in Chapter 3, "Troubleshooting," or if the following situations require additional memory.

- Using an optional identity card requires at least 1.5MB RAM.
- Using the SelecType Level 2 USER INDIVIDUAL setting requires at least 0.5MB RAM per channel. If you plan to use more than one interface channel for the ActionLaser 1000 or more than two interface channels for the ActionLaser 1500, you must add at least 0.5MB RAM.

Selecting a memory chip set combination

Before adding memory, you should determine the combination of chip sets you need to obtain the desired total RAM. Keep in mind that the ActionLaser 1000 comes with 0.5MB RAM and the ActionLaser 1500 comes with 1.0MB RAM.

The table below describes the chip sets you may install on your printer's controller board.

Chip sets installed	Total RAM	
	ActionLaser 1000	ActionLaser 1500
No chip sets	0.5MB	1.0MB
One 0.5MB chip set	1.0MB	1.5MB
Two 0.5MB chip sets	1.5MB	2.0MB
Three 0.5MB chip sets	2.0MB	*
One 2.0MB chip set	2.5MB	3.0MB
One 2.0MB chip set and one 0.5MB chip set	3.0MB	3.5MB
One 2.0MB chip set and two 0.5MB chip sets	3.5MB	*
Two 2.0MB chip sets	4.5MB	5.0MB
Two 2.0MB chip sets and one 0.5MB chip set	5.0MB	*
Three 2.0MB chip sets	6.5MB	*

* On the ActionLaser 1500, one 0.5 MB chip set is initially installed, so you can add only two more optional chip sets.

Installing memory chip sets

To install the memory chip sets on the controller board, you need a cross-head screwdriver and a chip puller or a flat-head screwdriver. If you have questions about installing chip sets, contact your dealer for assistance.

WARNING:
High voltages are present inside the printer 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 destroyed by the static electricity in your body.

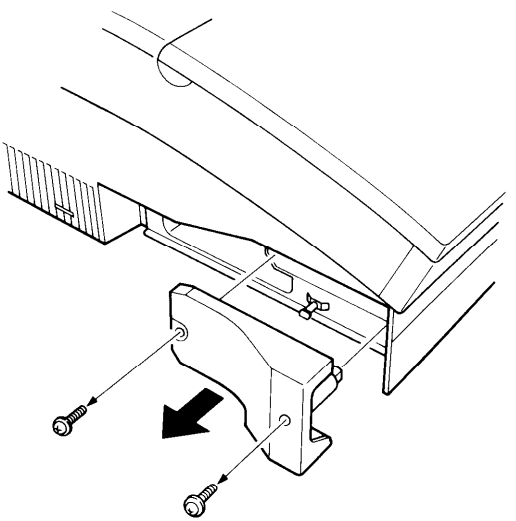
Removing the controller board

1. Turn off the printer and unplug the power cable from the electrical outlet.

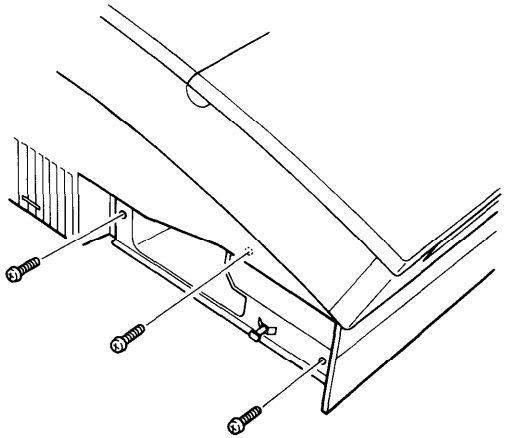
2. Remove the optional card, cartridge, or lower paper cassette unit, if installed.

3. Disconnect all interface cables from the interface connectors.

4. Turn the printer so that its left side faces you. Use a cross-head screwdriver to remove the two screws securing the interface board cover. Then pull off the cover. Keep the screws handy so that you can use them later.

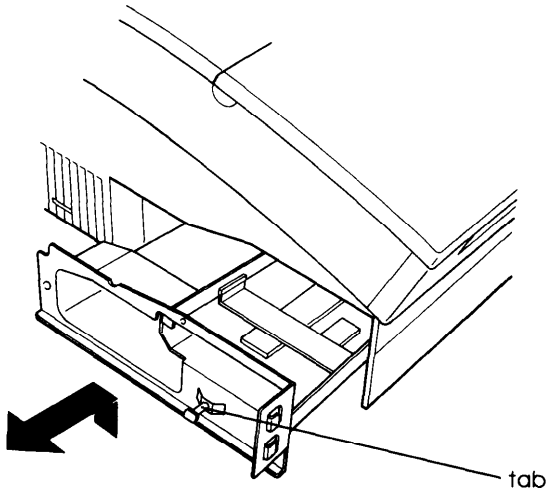


5. Remove the three silver screws that secure the metal bracket on the left side of the printer. Keep the screws handy so that you can use them to reinstall the controller board.

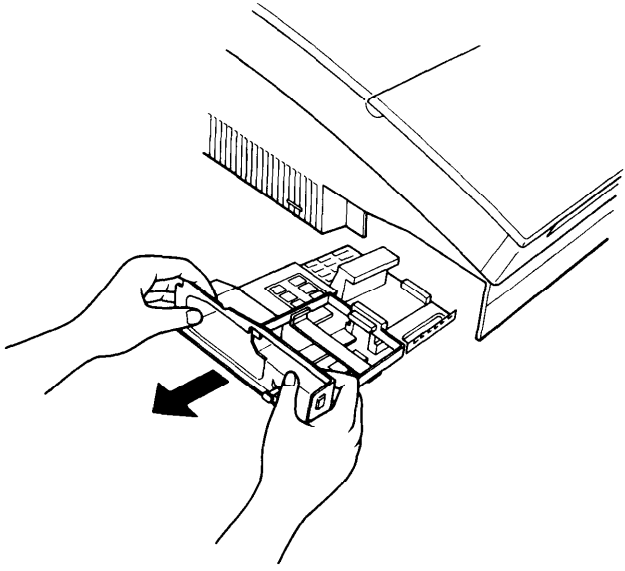


CAUTION:
Before you remove the controller board, make sure that you have removed any optional cards or cartridges. Otherwise, you my damage them.

6. Pull the tab on the bottom of the bracket to release the controller board, as shown on the next page.



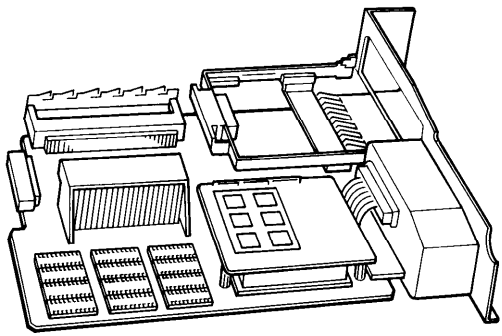
7. Grasp the board with both hands and pull it straight out of its slot.



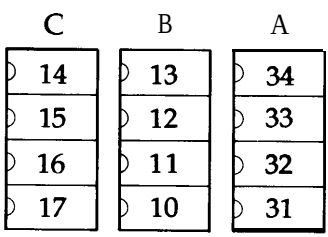
8. Place the controller board on a clean, flat surface with the bracket (connector) facing to your right.

Installing chip sets on the controller board

The RAM chip sockets are located on the bottom left side of the controller board.



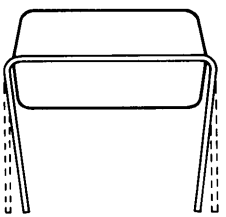
The ActionLaser 1000 board has three vacant sectors and the ActionLaser 1500 board has two vacant sectors, each containing four chip sockets (identified by their IC numbers). Also notice the notches on one end of each chip and socket. These notches must be aligned for proper installation.



You can install the chip sets into any of the vacant sectors. See the section “Selecting a memory chip set combination” earlier in this chapter for a list of the RAM configurations possible for the controller board.

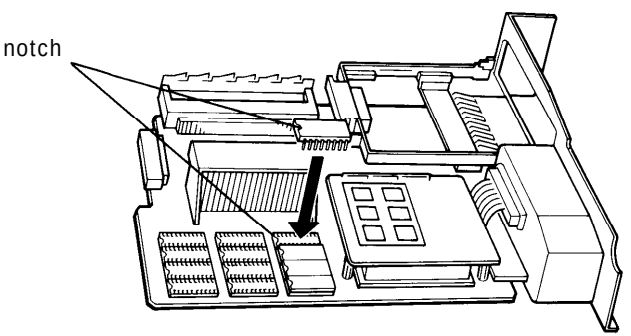
Sector	*IC number*
A (for ActionLaser 1000 only)	31,32,33,34
B	10,11,12,13
C	14,15,16,17

1. Make sure that all the pins on the chip are straight. The pins should point inward at slightly less than a 90° angle as shown below. If any of the pins are bent, straighten them by gently pushing them back into alignment with the other pins.



2. Align the pins with the holes in the socket. Be sure that the small notch on the end of the chip is facing to your left as shown below.

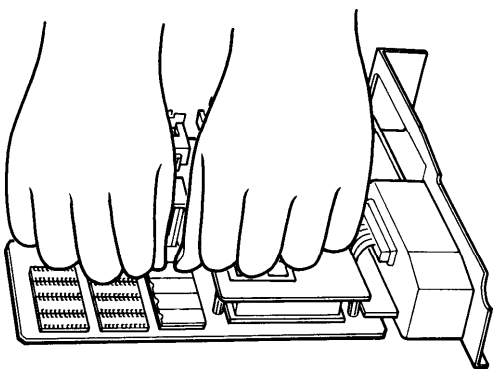
CAUTION:
Be sure to insert the chip so that the small notch on the end of the chip is aligned with the notch on the chip socket. Inserting the chips incorrectly will damage the printer.



3. Gently press the chip halfway into the socket. If the chip goes in at an angle, remove it with a chip puller or a small flat-head screwdriver and reinsert the chip.

CAUTION:
Be careful not to scratch the chip or the board when removing the chip.

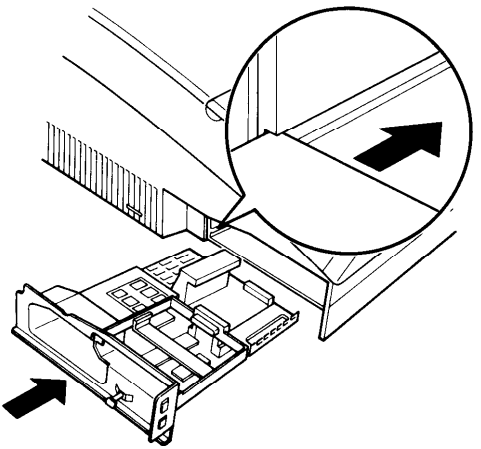
4. With the chip properly inserted, push down firmly on both ends of the chip to make sure it is well-seated.



5. Repeat steps 1 through *4* until all chips are installed.

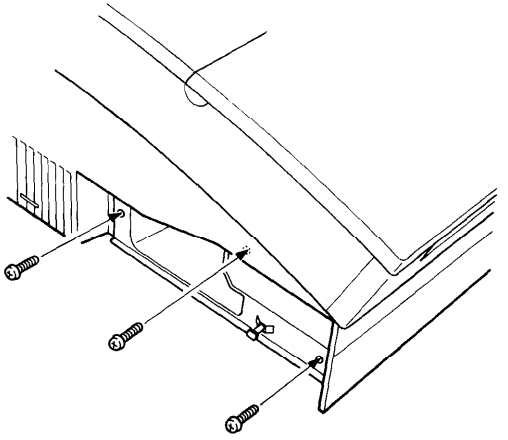
Reinstalling the controller board

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.

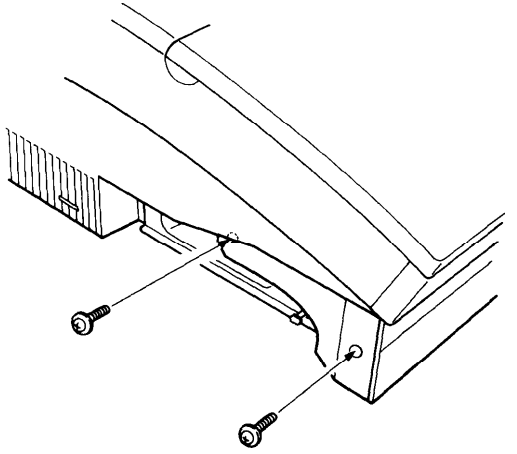


2. Slide the controller board into the printer until it locks in place. If the controller board does not fit smoothly into the printer, do not force it. Remove it and make sure the edges fit properly into the grooves in the board slot.

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

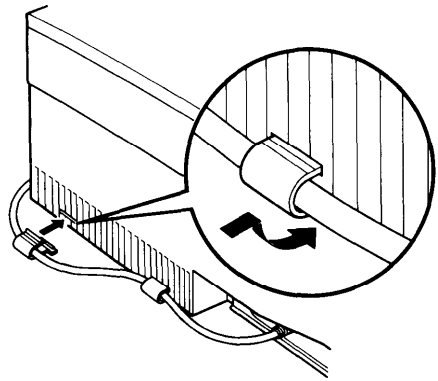


4. Fasten the interface board cover with the two screws you removed earlier.



5. Reconnect any interface cables you removed.

6. Insert the interface cable(s) 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 printer's memory

Complete the following steps to make sure that the memory chip sets are installed properly and are functioning correctly.

1. Turn on the printer power and watch the display for the following:

   ❑ All the indicator lights on the control panel light briefly.

   ❑ Themessage *RAM* Check appears.

2. Make sure that the amount of RAM displayed by the RAM check status message matches the new total RAM memory (including the resident memory of 0.5MB for the ActionLaser 1000 and 1.0MB for the ActionLaser 1500). Use the tables in "Selecting a memory chip set combination" described earlier in this chapter.

If the correct amount of RAM does not appear, turn off the printer and remove the controller board to check that the chip set is in the correct sector and that each chip is well-seated in its socket. If the RAM check message is still incorrect, contact a qualified service person for assistance.

Appendix A

Technical Specifications

A

Printer Specifications

Printing

Printing method:	Laser beam scanning and dry electrophotographic process
Resolution:	300 x 300 dpi
Printing speed:	Up to 6 pages per minute (letter or A4) (depending on the font and quantity of data)
First print:	Less than 20 seconds with letter or A4, face down or face up
Warm-up time:	35 seconds or less at normal temperature
Internal emulations:	❑ HP LaserJet series IIP emulation (ActionLaser 1000 only) Cl HP LaserJet series III emulation (ActionLaser 1500 only) ❑ ESC/P® 24pin printer emulation (LQ-2500) ❑ ESC/P 9-pin printer emulation (FX-800/1000,FX-86e/286e) ❑ Epson GL/2 mode (ActionLaser 1500 only)
IC card slots:	1 slot for font or identity cards
Cartridge slot:	1 slot for font cartridges
Resident fonts:	Fonts vary depending upon the printer emulation. See Appendixes B and C for details.
External fonts:	Optional fonts provided with font cards and cartridges. Downloadable fonts.

Paper and paper delivery

Paper specifications

Types:

- ❑ Plain paper
- ❑ Gummed labels
- ❑ Envelopes
- ❑ Transparencies
- ❑ Colored paper
- ❑ Cardstock

Epson does not recommend or guarantee the use of any particular brand of paper. Because paper characteristics are subject to change by individual manufacturers, it is your responsibility to ensure the quality of paper used with the printer.

Paper weight:

Plain paper: 60-90 g/m*, 16-24 lb
Cardstock: 90-157 g/m*, 24-42 lb
(single sheet feed only)

Paper size:

Paper size using SelecType

Paper:

TYPe	*Size*
A4	*210 x 297 mm*
A5	*148 x 210 mm*
B5	*182 x 257* mm
F4	210 x 330 mm
Letter	8.5 x 11 inches
Legal	8.5 x 14 inches
Half-letter	5.5 x 8.5 inches
Executive	7.25 x 10.5 inches
Government Legal	8.5 x 13 inches
Government Letter	*8.0 x 10.5* inches

Envelopes:	Type	Size
	Monarch	3 7/8 x 7 1/2 inches
	Commercial-10	4 1/8 x 9 1/2 inches
	DL	110 x 220 mm
	C5	162 x 229 mm
	Paper size range using software commands	
	Width	*Length*
	92-216 *mm* (3.63-8.5 inches)	148.5-356 *mm* (5.85-14 inches)
Printable area:	50 dots inside from every edge of the paper (at 300 dpi). Some printer emulations have different printable areas. See Appendixes B and C for details.	
Paper feed alignment and direction:	Center alignment for all sizes	
Paper feed:	Automatic or single sheet feed	
Input paper supply (75 g/m^2 or 20 lb paper):	150 sheets (for standard built-in paper bin) 250 sheets (for optional lower paper cassette unit) Several envelopes	
Paper eject:	Face down or face up (optional)	
Paper eject capacity (75 g/m^2 or 20 lb paper):	Face down, 100 sheets Face up, 20 sheets with optional face-up output tray	

Consumable products

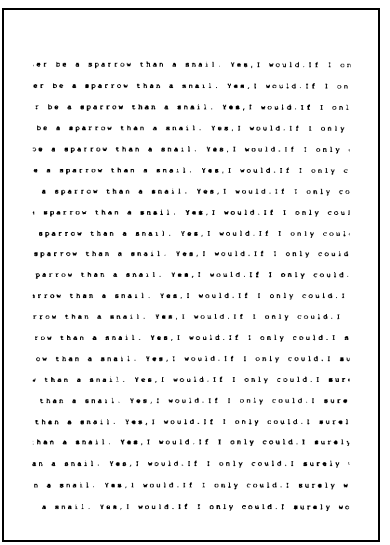
Imaging cartridge: (S051011)

Storage temperature: 0° to 35°C (32° to 95°F)

Storage humidity: 30 to 85% RH

Life: Typical imaging cartridge life is up to 6000 pages under the following conditions: Letter- or A4-size paper, continuous printing, and 5% print ratio.

Example of a 5% print ratio: (Reduced printout of letter size paper.)



Note:
The number of pages that you can print with an imaging cartridge varies depending on the type of printing you do. If you print a few pages at a time or print dense text exceeding 5% print ratio, your cartridge may print fewer pages.

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

120 V model

Rated voltage:	*90* to 132 VAC
Rated frequency:	50 to 60 Hz ± 3 Hz
Power consumption:	Less than 600 W
Rated current:	*5.5* A

Controller hardware

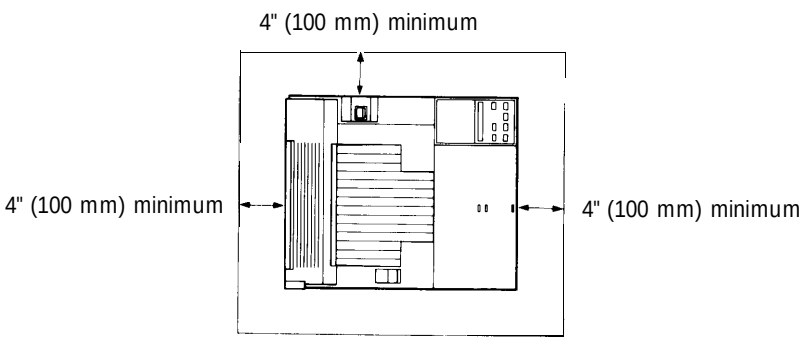
CPU:	68000 (CPU clock 16.67 MHz)	
RAM:	ActionLaser 1000:	0.5MB
	Optional:	Expandable up to 6.5MB including resident memory.
	ActionLaser 1500:	1.0MB
	Optional:	Expandable up to 5.0MB including resident memory.

Environmental

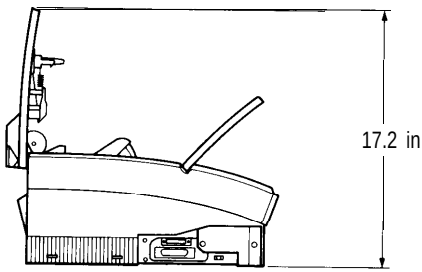
Temperature:	Operation:	10° to 35°C (50° to 95°F)
	Storage:	0° to 35°C (32° to 95°F)
Humidity:	Operation:	15 to 85% RH
	Storage:	*30* to 85% RH
Altitude:	2500 meters (8200 feet) maximum	

Printer location:

- ❑ Place the printer on flat, stable surface.
- ❑ Place the printer close enough to the computer or workstation for its cable to reach.
- ❑ Use a grounded outlet that has three holes to match the plug on the printer's power cord. Do not use an adapter plug.
- ❑ Leave adequate room around the printer to allow easy operation and maintenance as well as sufficient ventilation. The diagram below shows the recommended amount of space.



- To give you enough room to open the printer cover, allow 17.2 inches from the bottom of the printer to any shelf or surface directly above the printer, as shown below.



CAUTION:
Place the printer where you can easily unplug the power cord.

Avoid locations that are subject to direct sunlight, excessive heat, moisture, or dust.

Avoid using electrical outlets that are controlled by wall switches or automatic timers. Accidental disruption of power can wipe out valuable information in your printers memory.

Avoid using outlets on the same circuit with large motors or other appliances that might affect the power supply.

Keep the entire computer and printer system away from potential sources of interference, such as loudspeakers or the base units of cordless telephones.

Interface Specifications

The printer has the following resident interfaces:

- ❑ Parallel
- ❑ RS-232C serial (ActionLaser 1500 *only)*

Parallel interface

Your printer is equipped with an 8-bit parallel interface.

Parallel interface pin assignments

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

Signal Pin	Return Pin	Signal	Direction	Description
1	19	$\overline{\text{STROBE}}$	IN	This $\overline{\text{STROBE}}$ pulse to read data in. Pulse width must be more than 0.5 microseconds 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 level and at 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	

Signal Pin	Return Pin	Signal	Direction	Description
10	28	ACKNLG	OUT	About a 10-microsecond pulse. LOW indicates data has been received and that the printer is ready to accept more data.
11	29	BUSY	OUT	A HIGH signal indicates that the printer cannot receive data. The signal goes HIGH in the following cases: ❑ During data entry (for each character) ❑ During printing ❑ During off-line state ❑ During printer-error state
12	30	PE	OUT	A HIGH signal indicates that the printer is out of paper.
13	-	SLCT	OUT	Pulled up to +5V through 3.3 K ohm resistance.
14	-	$\overline{\text{AUTOFEED}}$	IN	During the LOW state, the paper is automatically fed one line after printing. (The signal level can be fixed using SelecType.)
15	-	NC	-	Not used.
16	-	GND	-	Logic ground level.
17	-	CHASSIS GND	-	Printer's chassis ground, which is isolated from the logic ground.
18	-	NC	-	Not used.
19-30	-	GND	-	Twisted-pair return signal ground level.

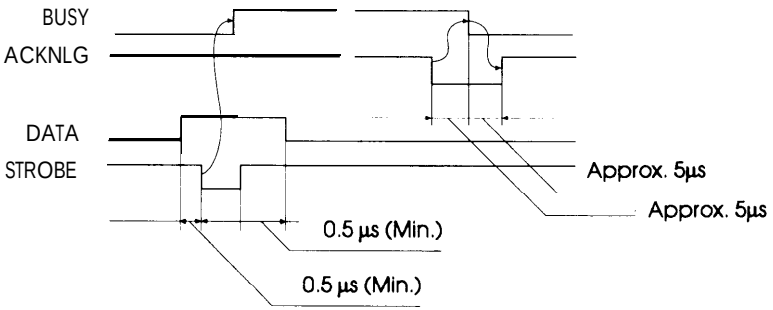
Signal Pin	Return Pin	Signal	Direction	Description
31	—	$\overline{\text{INIT}}$	IN	When this signal goes LOW, the printer controller ignores the $\overline{\text{STROBE}}$ signal.
32	-	$\overline{\text{ERROR}}$	OUT	This level goes LOW when the printer is: ❑ out of paper ❑ in error state ❑ off line
33	-	GND	—	Same as for Pins 19 - 30.
34	—	NC	—	Not used.
35	—	+5V	-	Pulled up to +5V through 3.3 Kohm resistance.
36	-	$\overline{\text{SLCTIN}}$	IN	The DC 1/DC3 control codes are valid only when this signal is HIGH ($\overline{\text{SLCTIN}}$ set to OFF). This setting can be changed with SelecType.

Note:

- ❑ All interface conditions are based on TTL level. Both the rise and fall 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 the receipt of the ACKNLG 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 for each signal and to complete the connection on the return side.
- ❑ The ACKNLG pulse width varies or is permanently set to HIGH, depending on the setting of the BUSY DELAY option in SelecType Level 2.

Interface timing

The figure below shows the timing for the parallel interface.



Signal level: TTL compatible

Serial interface

Data format

Word length: 7 or 8 bits

Parity: None, odd, or even

Stop bits: 1 or ***2***

Printer ready protocol: Enabled (DTR and XON/XOFF protocol set to ON).

The data format can be set using functions and menu items in SelecType.

Baud rate: ***300,600,1200,2400,4800,9600,19200,*** 38400 bits per second.

Signal level: RS-232C: Conforms to EIA

Connector: D-sub 25-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 128 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 256 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

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

Serial interface 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	Signal	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	IN	Received data. This pin transmits serial data from the computer to the printer.

Signal Pin	Signal	Direction	Description
4	RTS	OUT	Request to send. This pin is held high by the printer.
5	CTS	IN	Clear to send. This pin indicates that the computer is ready to receive data from the printer. The printer will not proceed unless the signal is high. Can be set high with SelecType.
6	DSR	IN	Data set ready. This pin indicates that the computer is ready to receive data from the printer. Can be set high with SelecType.
	SG	—	Signal ground. This pin provides a ground for all the signal lines.
8	DCD	IN	Data carrier detect. Always ignored.
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 (i.e. the printer is ready to receive data). If 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 SelecType.

Initialization

There are four types of printer initialization (returning the printer to a fixed set of conditions): initialize, reset, load macro, and factory reset.

Initialize

The SelecType Level 1 settings return to the power-on default settings, received print and downloaded font data clears, and the power-on default conditions return when:

- ❑ The printer is turned off, then back on after at least five seconds.
- ❑ You press RESET until the display shows INITIALIZE.

Reset

Received print data clears and the SelecType Level 1 settings return to the settings in the previously-loaded macro (or to the power-on default settings if you have not executed the LOAD MACRO option) when:

- ❑ You press RESET so that the display shows **RESET.**
- ❑ You send the RESET software command to the printer.

Loud macro

The SelecType Level 1 settings change to the settings in the loaded macro when:

- ❑ You execute the LOAD MACRO setting in the SelecType Level 1 SYSTEM CONFIG. menu.

Factory reset

The SelecType (Level 1 and Level 2) settings return to the default settings, the received print and downloaded font data clears, and power-on default conditions return when:

- ❑ You hold down the RESET button as you turn on the printer.

Default settings

Please see Appendixes B and C for the default settings of the resident printer emulations.

Option Specifications

Face-up output tray

Dimensions and weight:	Without the printer:	
	Height	36 mm (1.4 inches)
	Width	245 mm (9.6 inches)
	Depth	258 mm (10.2 inches)
	Weight	0.1 Kg (0.2 lb)
Paper eject capacity:	20 sheets (80 g / m^2)	

Lower paper casette unit

Electrical

Power supply:	DC 24V supplied by the printer

Paper and paper delivery

Size:	Letter (C812301) A4 (C812302)
Weight:	60-90 g / m^2 (16-24 lb)
Paper feed:	Automatic feed delivery system: Tray capacity up to 250 sheets (75 g / m^2 or 20 lb paper)
Feeding speed:	For the first sheet, 22 seconds or less (letter- or A4-size). For subsequent sheets, up to 6 pages per minute (letter- or A4-size paper).
Paper type:	Plain paper, such as copier paper, memo sheets, and letterhead

Mechanical

Dimensions and weight:

Without the printer:

Height	72 mm (2.8 inches)
Width	354 mm (13.9 inches)
Depth	458 mm (18 inches) including the cassette
Weight	2.8 Kg (6.2 lb) including the cassette

Appendix B

HP Emulation Mode

Introduction

HP emulation allows you to use application software designed for the HP LaserJet series IIP and III printers. The ActionLaser 1000 uses HPIIP emulation (LJ-2P) and the ActionLaser 1500 uses HPIII emulation (3/P/Si) as their default emulations.

Most of the features of the LJ-2P and 3/P/Si emulations are the same. The major difference is that scalable fonts and vector graphics are available only in 3/P/Si emulation.

This section gives you information about using HP emulation. It describes the unique features of your printer's HP emulation as well as the differences between your printer's HP emulation and printing with an HP LaserJet itself.

You will also find information on Epson GL/2 emulation along with a list of GL/2 emulation commands.

ActionLaser to HP LaserJet print feature comparison

Operating the printer in HP emulation differs slightly from operating an HP LaserJet series IIP or III because the printers use different technologies. The differences in printing are explained below.

	Epson Actionlaser	HP LaserJet series IIP	HP LaserJet series III
Input paper supply	150 sheets 400 sheets (with option)	70 sheets 250 sheets (with option)	200 sheets
Paper size	Letter Legal A4 Executive Half*-letter B5* A5* G-letter' F-4* Monarch 7-3/4 Commercial 10 DL C5	Letter Legal A4 Executive Monarch 7-3/4 #10 DL C5	Letter Legal A4 Executive Monarch 7-3/4 #10 DL C5
Resident fonts	Bitmap 14 Scalable 13**	Bitmap 7	Bitmap 10 Scalable 8***

- These paper sizes can be selected only with SelecType, not application software or printer commands. See Chapter 4, 'SelecType.'
- * Available on the ActionLaser 1500 only.
- ** You can select only 8 of the 13 scalable fonts with an HP LaserJet III driver. You can send printer commands to select the other five fonts or use a LaserJet IIISi driver. See the printer commands later in this chapter.

Printable area

The size of the printable area for the HP LaserJet series IIP and III and this printer is the same: 50 dots within the edge of the paper (at 300 dpi). The maximum number of characters that can be printed per line is also the same. However, the absolute print position may not be exactly the same as the printout from an HP LaserJet printer.

In order to match your printing to the output produced on an HP LaserJet series IIP or III printer, you can use the T-OFFSET and L-OFFSET feature of the SYSTEM CONFIG. option in SelecType Level 1 to make fine adjustments to the print start position. However, because the offset feature can move the printing position to a point outside of the printable area, some of the data may not be printed. See Chapter *4* for more information on SelecType.

Character dipping

If a character is partially outside the printable area, the HP LaserJet clips it and the part outside of the printable area is not printed.

Paper handling

When using the printer in HP emulation, the paper size is not determined by the paper bin or cassette as it is with an HP LaserJet printer. Use the PAGE SIZE option in SelecType Level 1 to set any of the fourteen paper sizes supported by the printer. For certain nonstandard sizes of paper, you may need to use the single sheet feed option described in Chapter 2.

Operating the printer as an HP LaserJet IIISi

Your ActionLaser 1500 uses HP emulation to operate as an HP LaserJet IIISi. If your application software does not list the ActionLaser 1500 on its printer menu but does list the HP LaserJet IIISi, choose the LaserJet IIISi instead of the LaserJet III to take advantage of all of your printer's features.

In addition to the differences between the ActionLaser 1500 and the LaserJet III described in the previous section, there are only a few additional differences between the ActionLaser 1500 and the LaserJet IIISi.

On the ActionLaser 1500, JobOffset and PaperDestination commands are ignored, and the Duplex command is treated as a page eject command. Also, network interface boards are not available on this printer.

Note:
If your program does not have a driver for HP LaserJet IIISi but does have a feature to send printer commands, send the commands shown below to select them.

	ESC (#	ESC (s#P	ESC (s#B	ESC (s#S	ESC (s#T
Epson Sans Serif U Medium Condensed	#	1	0	4	52
Epson Sans Serif U Medium Condensed Italic	#	1	0	5	52
Epson Sans Serif U Bold Condensed	#	1	3	4	52
Epson Sans Serif U Bold Condensed Italic	#	1	3	5	52
ITC Zapf Dingbats	#	1	0	0	45

For the value of # (ID number) in the Esc (# command, see the "Printer command summary" later in this chapter.

SelecType Options

This section lists unique menus and options available when you use SelecType in LaserJet emulation. See Chapter 4 for more information on SelecType.

ORIENT.

The orientation option selects the direction in which the characters are printed on a page. You can choose portrait (vertical), landscape (horizontal), reverse portrait (opposite direction of portrait), and reverse landscape (opposite direction of landscape).

Menu/submenu	Available options
♦ **ORIENT. PORT**	▶ **PORT** (portrait) **LAND** (landscape) **R-PORT** (reverse portrait) **R-LAND** (reverselandscape)

FONT

The FONT option selects the font source and then the font.

Menu/submenu	Available options
♦ **FONT RD-** 0 ↗	**RD** (resident font) **A** (font card slot) C (font cartridge slot) **D L** (downloadable font)

Only available options appear on the display. Options A and C are available only if you insert a font card or cartridge in those slots. The DL option appears only when a font has been downloaded from your computer.

Note:
To find out which font cards are available in HP emulation, see your dealer. For available font cartridges, see Chapter 5, "Options."

After you select the font source, press ▲ or ▼ until the display shows the font number you want; then press ▶ to select the font. The font number is based on the font source option (RD, A, C, or DL) selected above. The available fonts and their numbers are listed in the SelecType Level 1 FONT SAMPLE printout. If your are using the 3/P/Si emulation and the font you select is a scalable font, you must perform an additional step as follows.

If you select a proportional font, press ▲ or ▼ to select the font's point size. Then press ▶ once to set that point size.

Menu/submenu		Available options
HEIGHT ♦ XXPT.	**▶ SET**	**4.00 to 999.75** (in steps of 0.25) or ******

If ****** appears on the display, the point size you selected is out of the possible range of 4.00 to 999.75.

If you selected a fixed pitch font, press ▲ or ▼ to select the spacing in characters per inch. Then press ▶ once to set that spacing.

Menu/submenu		Available options
PITCH ♦ XXCPI	**▶ SET**	**0.44 to 99.99 (in steps of 0.01)** or *****

If ***** appears on the display, the spacing you selected is out of the possible range of 0.44 to 99.99.

If you change the SYMSET setting, the available font numbers may change. To save the selected font as the default font, use the SAVE MACRO option in the Level 1 SYSTEM CONFIG. menu.

SUB CONFIG.

In HP emulation, the SUB CONFIG. option includes two submenus.

Menu/submenu			Available options
♦ **SUB CONFIG.**		▶	**F O R M** **SYMSET**

FORM-Use the FORM option to set the number of lines for the selected paper size and orientation. The setting you choose also changes the line spacing. This setting is affected by the PAGE SIZE, ORIENT., and FONT settings. If you select 0, the line spacing changes to 1/6-inch.

Menu/submenu			Available options
♦ **FORM**	**64LINES**	▶	0 through **128** or ***

If *** appears on the display, the number of lines you selected is out of the possible range of 0 to 128.

SYMSET-Use the SYMSET option to choose from 26 (LJ-2P emulation) or 40 (3/P/Si emulation) resident HP symbol sets. In most cases, you will not change this setting.

In the following table, the options in the right column are available only with scalable fonts.

Menu/submenu	Available options	
	LJ-2P and 3/P/Si	3/P/Si
♦ SYMSET Roman-8	▶ Roman-8	PSMath
	IBM-US	VeInter
	IBM-DN	PSText
	ECM94-1	VeUS
	IRV	Windows
	French	MSPubli
	UK	VeMath
	Chinese	DeskTop
	ANSI AS	Math-8
	Norweg1	Pi Font
	Swedish	VeZapf D
	Norweg2	PsZapf D
	Swedis2	Zd100
	French2	Zd200
	JIS ASC	Zd300
	IBMPor	
	Italian	
	IBMSpa	
	Portugu	
	HP Germ	
	Spanish	
	HP Span	
	German	
	Roman E	
	Legal	
	PcMulti	

Available Fonts and Symbol Sets

This section describes the fonts and symbol sets available in HP emulation.

The printer offers a variety of resident fonts in HP emulation. Character samples of each font are included later in this appendix.

The following table lists the resident fonts available in HP emulation. Five fonts marked with an asterisk (*) are available only if you have an ActionLaser 1500 and you use a LaserJet IIISi driver or by using a printer command. When you select one of the proprietary fonts identified below (right column) from your application software, your printer prints the Epson resident font (left column). See sample fonts later in this section.

Bitmap fonts (resident)	Software name
Courier Courier bold Courier italic	Courier
Line printer	Line printer
Epson Roman T Epson Roman T Bold Epson Roman T Italic Epson Roman T Bold Italic	CG Times**
Epson Sans Serif U Epson Sans Serif U Italic Epson Sans Serif U Bold Epson Sans Serif U Bold Italic	Univers***
Epson Sans Serif U Medium Condensed' Epson Sans Serif U Bold Condensed+ Epson Sans Serif U Medium Condensed italic* Epson Sans Serif U Bold Condensed Italic*	Univers condensed**
ITC Zapf Dingbats'	ITC Zapf Dingbats**

. Scalable fonts are not available in LJ-2P emulation.

.* In GL/2 emulation, two more fonts (the Stick fixed and proportional fonts) are available.

Epson resident fonts are different from the proprietary fonts identified in HP emulation. However, Epson resident fonts have character widths and character designs similar to the proprietary fonts identified in HP emulation.

The optional fonts available with the optional font card or font cartridge are listed in a following section.

The following table lists the font attributes that can be changed for bitmap and scalable fonts:

Attribute	Bitmap	Scalable
Orientation	O	O
Symbol Set	O	O
Pitch	X	O
Point size	X	O
Typestyle	X	X
Weight	X	X

Resident bitmap fonts

The following table lists the attributes (characteristics) of the resident bitmap fonts available in HP emulation.

Font name	Pitch	Point size
Courier	10cpi	12
Courier Bold	10cpi	12
Courier Italic	10cpi	12
Courier	12cpi	10
Courier Bold	12cpi	10
Courier Italic	12cpi	10
Line Printer	16.66cpi	8.5

- Portrait orientation is available for all fonts with the ActionLaser 1000. Both orientations (portrait and landscape) are available for all fonts with the ActionLaser 1500.

- 26 symbol sets are available for all fonts.

Resident scalable fonts

Resident scalable fonts are available only with HP III emulation (3/P/Si). The following table lists the attributes of the resident scalable fonts. You can use your software or SelecType to control the attribute values given in the table below in HP III emulation.

Font name	Symbol set	Point size	Typeface	Style	Weight
Epson RomanT	35 sets	0.25-999.75	Epson Roman T	U	Medium
Epson Roman T bold	35 sets	0.25-999.75	Epson Roman T	U	Bold
Epson Roman T italic	35 sets	0.25-999.75	Epson Roman T		Medium
Epson Roman T bold italic	35 sets	0.25-999.75	Epson Roman T		Bold
Epson Sans Serif U	35sets	0.25-999.75	Epson Sans Serif U	U	Medium
Epson Sans Serif U bold	35 sets	0.25-999.75	Epson Sans Serif U	U	Bold
Epson Sans Serif U italic	35 sets	0.25-999.75	Epson Sans Serif U		Medium
Epson Sans Serif U bold italic	35 sets	0.25-999.75	Epson Suns Serif U		Bold
Epson Sans Serif U medium condensed	35 sets	0.25-999.75	Epson Sans Serif U	cu	Medium
Epson Sans Serif U bold condensed	35 sets	0.25-999.75	Epson Sans SerifU	cu	Bold
Epson Sans Serif U medium condensed italic	35 sets	0.25-999.75	Epson Sans Serif U	Cl	Medium
Epson Sans Serif U bold condensed italic	35 sets	0.25-999.75	Epson Sans Serif U	Cl	Bold
ITC Zapf Dingbats	5sets	0.25-999.75	ITCZapf Dingbats	U	Medium

- All of the orientations (portrait, landscape, reverse portrait, and reverse landscape) are available for all the fonts.
- The spacing for all fonts is proportional.
- Style: U=upright, I=italic, CU=condensed upright, CI=condensed italic
- In GL/2 emulation, some font enhancements such as rotation, italic, mirror image, and outline are available. Also, two more fonts (the stick fixed and proportional fonts) are available only in GL/2 emulation.

Font samples

The font samples below show only portrait orientation; the characters are the same in landscape orientation.

Courier	12point	0123456789
Courier bold	**12point**	**0123456789**
Courier italic	***12point***	***0123456789***
Courier	**10point**	**0123456789**
Courier bold	**10point**	**0123456789**
Courier italic	***10point***	***0123456789***
Line printer	8.5point	0123456789

Epson Roman T

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Roman T Bold

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Roman T Italic

ABCDEFGHIJKLMNOPQRSTUVWWZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Roman T Bold Italic

ABCDEFGHIJKLMNOPQRSTUWXYZ
abcdefghijklmnopqrstuvwxyz
0123454789

Epson Sans Serif U

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Sans Serif U Bold

ABCDEFGHIJKLMNOPQRSTUWVXYZ
abcdefghijklmnopqrstuwvxyz
0123456789

Epson Sans Serif U Italic

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Sans Serif U Bold Italic

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyrz
0123456789

Epson Sans Serif U Medium Condensed

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Sans Serif U Bold Condensed

ABCDEFGHIJKLMNOPQRSTUWWYZ
abcdefghijklmnopqrstuwvxyz
0123456789

Epson Sans Serif U Medium Condensed italic

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Epson Sans Serif U Bold Condensed italic

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

ITC Zapf Dingbats

Stick Fixed

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Proportional Stick

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789

Note:
The ActionLaser 1500 printer can print fonts generated by Bitstream® FaceLift™ and Bitstream Fontware® Installation Kits using Bitstream Typeface Packages for the PC. Refer to your FaceLift **or** *Fontware User Guide for instructions on using Bitstream typefaces with HP LaserJet compatible printers.*

Symbol sets

Your printer can access a variety of symbol sets. Many of these symbol sets differ only in the international characters specific to each language. Not all symbol sets are available in all emulations.

The following table lists the resident symbol sets in HP emulation.

Symbol name	Available fonts		
	Bitmap	Scalable	Scalable (ITC Zapf Dingbats)
Roman-	❍	❍	
Norweg 1	❍	❍	
Roman Extension	❍		
French	❍	❍	
HP German	❍	❍	
Italian	❍	❍	
JIS ASCII	❍	❍	
ECM94-1	❍	❍	–
Swedish2	❍	❍	–
ANSI ASCII	❍	❍	–
Norweg2	❍	❍	–
UK	❍	❍	–
French2	❍	❍	–
German	❍	❍	–
HP Spanish	❍	❍	–
Legal	❍	❍	–
Chinese	❍	❍	–
Spanish	❍	❍	–
IRV	❍	❍	–
Swedish	❍	❍	–
Portuguese	❍	❍	–
IBM Portuguese	❍	❍	–
IBM Spanish	❍	❍	–
IBM-US	❍	❍	–
IBM-DN	❍	❍	–
PcMultilingual	❍	❍	–
PsMath		❍	–
Windows		❍	–
PsText		❍	–
VeInternational		❍	–
VeUS		❍	–
MsPublishing		❍	–
VeMath		❍	–
DeskTop		❍	–
Math-8		❍	–
PiFont		❍	–
VeZapfDingbats			❍
PsZapfDingbats			❍
Zd100			❍
Zd200			❍
Zd300			❍

The following symbol set tables show you the available characters in HP emulation and their hexadecimal values. The ID number after the symbol set name provides the unique portion of the ESC command needed to select that particular symbol set.

International Set for ISO Sets

ID	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
0U	#	$	@	[	\	]	^	'	{	|	}	~
0D	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	—
0F	£	$	à	°	ç	§	^	`	é	ù	è	¨
0G	£	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
0I	£	$	§	°	ç	é	^	ù	à	ò	è	ì
0K	#	$	@	[	¥	]	^	`	{	|	}	—
0S	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
1D	§	$	@	Æ	Ø	Å	^	`	æ	ø	å	|
1E	£	$	@	[	\	]	^	`	{	|	}	—
1F	£	$	à	°	ç	§	^	µ	é	ù	è	¨
1G	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
1S	#	$	@	¡	Ñ	¿	°	`	{	ñ	}	~
2K	#	¥	@	[	\	]	^	`	{	|	}	—
2S	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
2U	#	¤	@	[	\	]	^	`	{	|	}	—
3S	#	¤	@	Ä	Ö	Å	^	`	ä	ö	å	—
4S	#	$	§	Ã	Ç	Õ	^	`	ã	ç	õ	°
5S	#	$	´	Ã	Ç	Õ	^	`	ã	ç	õ	~
6S	#	$	·	¡	Ñ	Ç	¿	`	´	ñ	ç	¨

ISO ANSI ASCII (OU)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{								
C			,	<	L	\	l	I								
D			-	=	M	]	m	}								
E			.	>	N	^	n	~								
F			/	?	O	-	o	#								

Roman-8 (8U)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	'	p				¯	â	Å	Á	Þ
1			!	1	A	Q	a	q			À	Ý	ê	î	Ã	þ
2			"	2	B	R	b	r			Â	ý	ô	Ø	ã	·
3			#	3	C	S	c	s			È	.	û	Æ	Ð	µ
4			$	4	D	T	d	t			Ê	Ç	á	å	õ	¶
5			%	5	E	U	e	u			Ë	ç	é	í	Í	¾
6			&	6	F	V	f	v			Î	Ñ	ó	ø	Ì	-
7			'	7	G	W	g	w			Ï	ñ	ú	æ	Ó	¼
8			(	8	H	X	h	x			´	¡	a	Ä	Ò	½
9			)	9	I	Y	i	y			`	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z			^	¤	ò	Ö	õ	Q
B			⌧	,	K	[	k	{			¨	£	ù	Ü	Š	<<
C			¦	<	L	\	l	|		~	¥	ä	É	š	■
D			-	=	M	]	m	}			Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~			Û	ƒ	ö	ß	Ÿ	±
F			/	?	O	_	o	▓			£	ç	ü	Ô	ÿ	

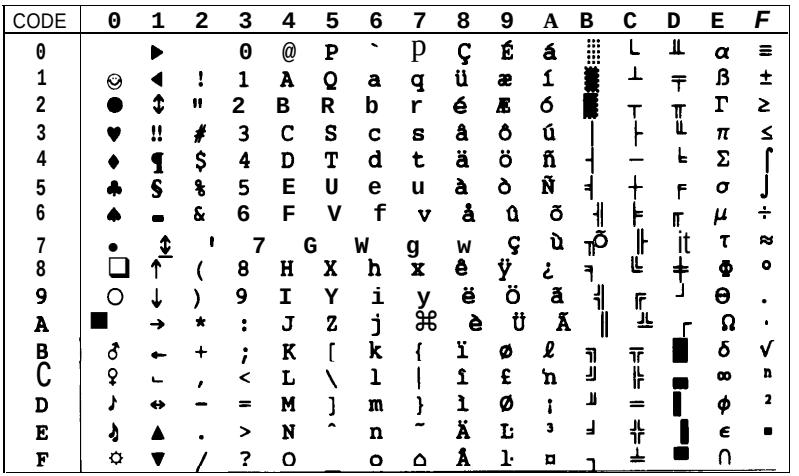
ECMA-94 ***Latin-1 (ON)***

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			¡	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			¨	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			⊡	,	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}				½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F	L		/	?	O	_	o	#			¯	¿	Ï	ß	ï	ÿ

IBM-US (10U)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▶		0	@	P	`	p	Ç	É	á	⁞	└	╙	α	≡
1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	ß	±
2	●	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	!!	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	❑	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	■	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	¢	½	╗	╦	▒	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	¼	╝	╠	▒	∞	n
D	♪	↔	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	♫	▲	.	>	N	^	n	~	Ä	₧	«	╛	╬	▐	ε	■
F	☼	▼	/	?	O		o	⌂	Å	ƒ	»	┐	╧	▀	∩	

IBM-DN (11U)



CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▶		0	@	P	`	p	Ç	É	á	⣿	└	╨	α	≡
1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▓	┴	╤	ß	±
2	●	↕	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	♥	‼	#	3	C	S	c	s	â	ô	ú	▒	├	╙	π	≤
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	╘	Σ	⌠
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	♠	▬	&	6	F	V	f	v	å	û	õ	╢	╞	╓	μ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	Õ	╖	╟	╫	τ	≈
8	❑	↑	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	ã	╣	╔	┘	Θ	·
A	■	→	*	:	J	Z	j	⌘	è	Ü	Ã	║	╩	┌	Ω	·
B	♂	←	+	;	K	[	k	{	ï	ø	ℓ	╗	╦	█	δ	√
C	♀	∟	,	<	L	\	l	|	î	£	ħ	╝	╠	▄	∞	n
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	╜	═	▌	φ	2
E	♫	▲	.	>	N	^	n	~	Ä	Ł	³	╛	╬	▐	ε	■
F	☼	▼	/	?	O	_	o	⌂	Å	ł	¤	┐	╧	▀	∩	

PcMultilingual (12U)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		▶		0	@	P	`	p	Ç	É	á	⣿	└	ð	Ó	-
1	☺	◀	!	1	A	Q	a	q	ü	æ	í	▓	┴	Ð	ß	±
2	●	↕	'2	B	R	b	r	é	Æ	ó	▓	┬	Ê	Ô	‗
3	v	!!	#	3	C	S	c	s	â	ô	ú	▒	├	Ë	a	¾
4	♦	¶	$	4	D	T	d	t	ä	ö	ñ	┤	─	È	õ	¶
5	♣	§	%	5	E	U	e	u	à	ò	Ñ	Á	┼	ı	Õ	§
6	♠	▬	&	6	F	V	f	v	å	û	ª	Â	ã	f	µ	÷
7	•	↨	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	◘	↑	(	8	H	X	h	x	ê	ÿ	¿	©	╚	Ï	Þ	°
9	○	↓	)	9	I	Y	i	y	ë	Ö	®	╣	╔	┘	Ú	¨
A	■	→	*	:	J	Z	j	z	è	Ü	¬	║	╩	┌	Û	·
B	♂	←	+	;	K	[	k	{	ï	ø	½	╗	╦	█	Ù	¹
C	♀	I-	,	<	L	\	l	|	î	£	¼	╝	╠	▄	ý	³
D	♪	↔	-	=	M	]	m	}	ì	Ø	¡	¢	═	¦	Ý	²
E	♫	▲	.	>	N	^	n	~	Ä	X	«	¥	╬	Ì	¯	■
F	☼	▼	/	?	O		o	⌂	Å	ƒ	»	┐	¤	▀	´	

Legal (1U)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	°	p								
1			!	1	A	Q	a	q								
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t								
5			%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			'	7	G	W	g	w								
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	§								
C			,	<	L	®	l	¶								
D			-	=	M	]	m	†								
E			.	¢	N	©	n	™								
F			/	?	O	_	o	▒								

Ventura Math (6M)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	≅	Π	‾	π			◇	®	≤	↓	|	∏
1			!	1	Α	Θ	α	θ			✓	⊃	♦	←	·	™
2			∀	2	Β	Ρ	β	ρ			|	⊇	≥	®	∠	⇐
3			#	3	Χ	Σ	χ	σ			⌈	⌈	∂	"	⌋	⇔
4			∃	4	Δ	Τ	δ	τ			|		ℵ	f		∨
5			%	5	Ε	Υ	ε	υ			|	♣	'	ℑ	{	∑
6			&	6	Φ	ς	φ	ϖ			⌊	⊕	ℜ	©	⌈	™
7			∋	7	Γ	Ω	γ	ω			|	⊗	℘	±	⟩	—
8			(	8	Η	Ξ	η	ξ			⇑	⊆	∞	→		—
9			)	9	Ι	Ψ	ι	ψ			⇒	∪	♠	↑	¬	∅
A			*	:	ϑ	Ζ	φ	ζ			⇓	—	∝	≠	∇	∩
B			+	;	Κ	[	κ	{			⇙	…	•	≡	⌈	∈
C			,	<	Λ	∴	λ	|			⊂	|	/	°	|	©
D			-	=	Μ	]	μ	}			⌋	∧	♥	↔	⌉	∉
E			.	>	Ν	⊥	ν	~			|	↵	×	⌉	⌋	⌉
F			/	?	Ο	_	ο				⌋	≈	ϒ	∫	÷	⟨

Ventura International (13J)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	‘	p			„	‰	â	Å	Á	Œ
1			!	1	A	Q	a	q			À	“	ê	î	Ã	œ
2			"	2	B	R	b	r			Â	”	ô	Ø	ã	¶
3			#	3	C	S	c	s			È	°	û	Æ		†
4			$	4	D	T	d	t			Ê	Ç	á	å		‡
5			%	5	E	U	e	u			Ë	ç	é	í	Í	–
6			&	6	F	V	f	v			Î	Ñ	ó	ø	Ì	–
7			’	7	G	W	g	w			Ï	ñ	ú	æ	Ó	
8			(	8	H	X	h	x			©	¡	à	Ä	Ò	
9			)	9	I	Y	i	y			®	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z			™	¤	ò	Ö	õ	º
B			+	;	K	[	k	{			‹	£	ù	Ü	Š	«
C			,	<	L	\	l	|		›	¥	ä	É	š	•
D			-	=	M	]	m	}			Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~			Û	ƒ	ö	ß	Ÿ	
F			/	?	O	_	o					¢	ü	Ô	ÿ	…

Ventura US (14J)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	‘	p			„	‰				
1			!	1	A	Q	a	q				“				
2			"	2	B	R	b	r				”				¶
3			#	3	C	S	c	s				°				†
4			$	4	D	T	d	t								‡
5			%	5	E	U	e	u								–
6			&	6	F	V	f	v								–
7			’	7	G	W	g	w								
8			(	8	H	X	h	x			©					
9			)	9	I	Y	i	y			®					
A			*	:	J	Z	j	z			™					
B			+	;	K	[	k	{								
C			,	<	L	\	l	|								•
D			-	=	M	]	m	}				§				
E			.	>	N	^	n	~								
F			/	?	O	_	o					¢				…

PS Math (5M)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	≅	Π	‾	π				°	ℵ	∠	◇	
1			!	1	Α	Θ	α	θ			ϒ	±	ℑ	∇	⟨	⟩
2			∀	2	Β	Ρ	β	ρ			′	″	ℜ	®	®	∫
3			#	3	Χ	Σ	χ	σ			≤	≥	℘	©	©	⌠
4			∃	4	Δ	Τ	δ	τ			/	×	⊗	™	™	⎮
5			%	5	Ε	Υ	ε	υ			∞	∝	⊕	∏	∑	⌡
6			&	6	Φ	ς	φ	ϖ			ƒ	∂	∅	✓	⎡	⎤
7			∍	7	Γ	Ω	γ	ω			♣	•	∩	·	⎢	⎥
8			(	8	Η	Ξ	η	ξ			♦	÷	∪	¬	⎣	⎦
9			)	9	Ι	Ψ	ι	ψ			♥	≠	⊃	∧	⎡	⎤
A			*	:	ϑ	Ζ	φ	ζ			♠	≡	⊇	∨	⎢	⎥
B			+	;	Κ	[	κ	{			↔	≈	⊄	⇔	⎣	⎦
C			,	<	Λ	∴	λ	|			←	…	⊂	⇐	⎧	⎫
D			−	=	Μ	]	μ	}			↑	|	⊆	⇑	⎨	⎬
E			.	>	Ν	⊥	ν	~			→	—	∈	⇒	⎩	⎭
F			/	?	Ο	_	ο				↓	↵	∉	⇓	⎪	

PS Text (10J)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	‘	p						–		
1			!	1	A	Q	a	q			¡	–	`		Æ	æ
2			"	2	B	R	b	r			¢	†	´			
3			#	3	C	S	c	s			£	‡	ˆ		ª	
4			$	4	D	T	d	t			/	·	˜			
5			%	5	E	U	e	u			¥		¯			ı
6			&	6	F	V	f	v			ƒ	¶	˘			
7			’	7	G	W	g	w			§	•	˙			
8			(	8	H	X	h	x			¤	¸	¨		Ł	ł
9			)	9	I	Y	i	y			'				Ø	ø
A			*	:	J	Z	j	z			“	”	°		Œ	œ
B			+	;	K	[	k	{			«	»	¸		º	ß
C			,	<	L	\	l	|		‹	…				
D			-	=	M	]	m	}			›	‰	˝			
E			.	>	N	^	n	~			fi		˛			
F			/	?	O	_	o				fl	¿	ˇ			

Math-8 (8M)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	∴	Π	∵	π				‾	⊕	Å	⌈	⌉
1			✓	1	A	P	α	ρ			↑	∀	⊙	⊣	⌊	⌋
2			″	2	B	Σ	β	σ			→	∃	⊗	⊢	⌈	⌉
3			°	3	Γ	T	γ	τ			↓	⊤	⊖	⊧	{	}
4			∞	4	Δ	ϒ	δ	υ			←	⊥	⊘	϶	⌊	⌋
5			÷	5	E	Φ	ϵ	φ			⇑	∪	∧	∫	⌈	⌉
6			∝	6	Z	X	ζ	χ			⇒	∩	∨	∮	⌽	⌋
7			′	7	H	Ψ	η	ψ			⇓	∈	⊻	∠	⌊	⌋
8			(	8	Θ	Ω	θ	ω			⇐	∋	¬	∅	⌥	↓
9			)	9	I	∇	ι	ϑ			↕	∉	∘	ℵ	‖	⟩
A			×	e	K	∂	κ	φ			↔	⊂	·	ℶ	⌇	⌇
B			+	ε	Λ	ς	λ	ϖ			⇕	⊃	•	ℷ	⌇	⌇
C			,	<	M	≤	μ	≃			⇔	⊄	●	ℭ	—	∓
D			−	=	N	≠	ν	≡			⇄	⊅	○	ℑ	=	∓
E			.	>	Ξ	≥	ξ	≇			⇆	⊆	†	ℜ	*	±
F			/	≈	O	_	o	▩				⊇	‡	ℨ	≅	

Pi Font (15U)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				¯	::	℘	⎡	⎤								
1				˘	≙	℘	⎣	⎦								
2			”	ˇ		ℜ	⎛	⎞								
3			,	·		Σ	⎝	⎠								
4			“	↗			⎯	⎯								
5			”	↘			⎯	⎯								
6			‘	↙	f		⎯	⎯								
7			’	↖			⎜	⎜								
8			⟨	△	ℏ		⎜	⎜								
9			⟩	▷			⎜	⎜								
A			™	▽			⎜	⎜								
B			℠	◁		⎢	⎜	⎜								
C			®	◀	ℒ	⎢	□	■								
D			©	§	ℓ	⎥	◇	◆								
E			●	▶		‹										
F				¶		›		▩								

Microsoft Publishing (6J)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0					2		‘					°			Ω	
1			1								´	•	`	`		
2			”			℞					″	•	´	´		
3			3			Š	℅	š			^	•	ˆ	ˆ		
4			4			™					~	°	ˉ	ˉ		
5			5									○	ˉ	ˉ		1
6			7									○	˘	˘	IJ	ij
7			’									▪	·	·	Ŀ	ŀ
8			9									▪	¨	¨	Ł	ł
9			0			Ÿ					fi	■				
A			8			Ž		ž			fl	▫	°	°		
B			†								ff	□	¸	¸		
C			’	„			ℓ				ffi	□				
D			–	‡	–						ffl	‰	˝	˝		
E			…		–	⁶		“		Pt	‹	◆	˛	˛		
F			/		Œ	_	œ			ƒ	›	◇		ˇ	’n	

Windows (9U)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			!	1	A	Q	a	q		‘	¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r		’	¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▩			¯	¿	Ï	ß	ï	ÿ

DeskTop (7J)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	‘	p				“	–	‹	ª	´
1			!	1	A	Q	a	q			¶	”	±	›	º	ˋ
2			"	2	B	R	b	r			§	µ	×	«	æ	ˆ
3			#	3	C	S	c	s			†	‰	÷	»	Æ	¨
4			$	4	D	T	d	t			‡	•	°	,	ð	˜
5			%	5	E	U	e	u			©	●	’	„	Đ	ˇ
6			&	6	F	V	f	v			®	○	”	·	ij	˘
7			’	7	G	W	g	w			™	○	¼	¸	IJ	˝
8			(	8	H	X	h	x			℅	■	½	¿	ł	°
9			)	9	I	Y	i	y			¢	■	¾	Pt	Ł	˙
A			*	:	J	Z	j	z			–	▫	¹	ℓ	œ	¯
B			+	;	K	[	k	{			–	□	²	£	Œ	¸
C			,	<	L	\	l	|			…	'	³	¥	ø	˛
D			-	=	M	]	m	}			fi	¬	/	¤	Ø	
E			.	>	N	^	n	~			fl	¦		*f*	þ	ı
F			/	?	O	_	o	▩				═		ß	Þ	

Ventura ITC Zapf Dingbats (9L)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				✁	✠	☆	❀	❒			➡	➢	❣	④	➧	→
1			✂	✂	✡	✱	❁	❑			↔	⑩	♣	①	↕	➔
2			✂	✃	✢	✲	❂	❒			➡	❶	⑧	⑨	➐	➔
3			✂	✓	✣	✳	❃	▲			⇨	➡	❶	⑦	➠	➙
4			✄	✔	✤	✴	❄	▼			⇨		①	❦		➚
5			☎	✕	✥	✵	❅	◆			⇦	❧	❣	②	⇨	➡
6			✆	✖	✦	✶	❆	◆			⇦	⑥	③	⑩	⇦	➤
7			✇	✗	✧	✷	✳	◗			⇨	⑤	④	⑥	⇨	➔
8			✈	✘	★	✸	✱	|			→	❹	❥	③		➛
9			✉	✚	☆	✹	✻	▌			→	⑨	♥	②	➘	⑦
A			☛	✚	✪	✺	✳	▌			➡	❾	⑩	❶	⑧	⑧
B			☞	✛	☆	✻	✱	❻			❷	❼	❷	❺	➳	❺
C			✌	✜	✯	✼	●	❟			❸	❽	❤	⑤	➴	➢
D			✍	✝	★	✽	○	❝			➳	→	♦	♠	➹	❻
E			✎	✞	★	✾	■	❞			➴	⑩	⑨	➚	➳	➳
F			✏	✟	★	✿	❑				➳	❶	❡	➲	❹	➡

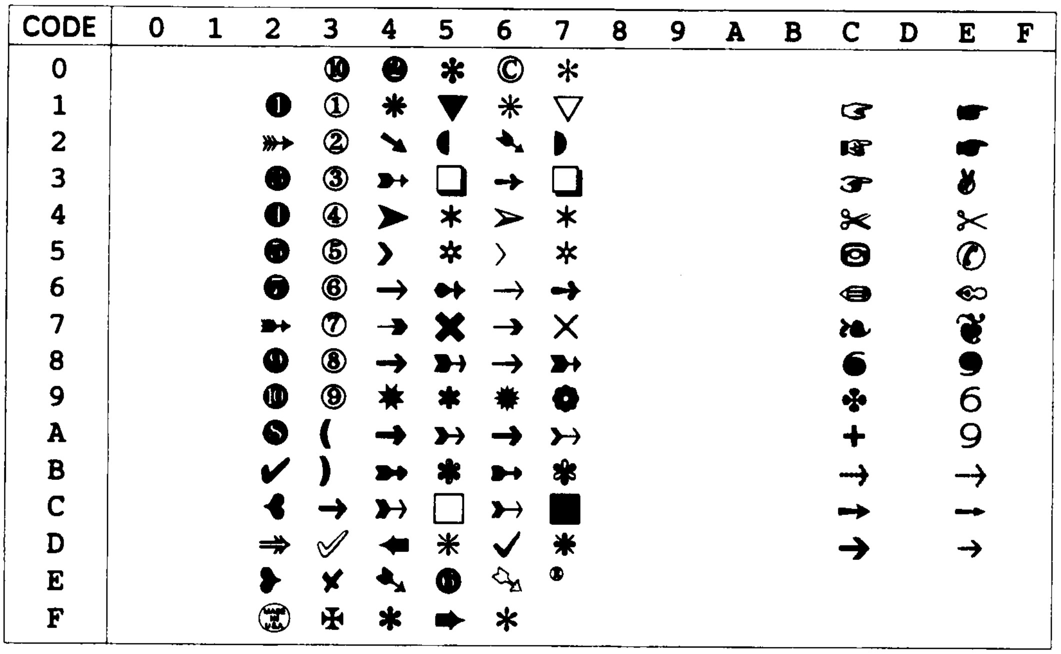
PS ITC Zapf Dingbats (10L)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				✎	✠	☆	❀	❐				⑤	①	❼	➡	
1			✁	✂	✡	✱	❁	❑			¶	⑥	②	❽	➡	⇨
2			✂	✒	✢	✲	❂	❒			❡	⑦	③	❾	➢	➲
3			✁	✓	✣	✳	✽	▲			❢	⑧	④	❿	➢	➳
4			✃	✔	✤	✴	❃	▼			❤	⑨	⑤	➔	➤	➴
5			☎	✕	✥	✵	❄	◆			❥	⑩	⑥	→	➧	➵
6			✆	✖	✦	✶	❅	❖			❦	❶	⑦	↔	➨	➶
7			✇	✗	✧	✷	✳	◗			❧	❷	⑧	↕	➩	➷
8			✈	✘	★	✸	✻	▌			♣	❸	⑨	↘	➧	➸
9			✉	✚	☆	✹	✼	▐			♦	❹	⑩	→	➪	➹
A			☛	✚	✪	✺	✳	▊			♥	❺	❶	➚	➪	➘
B			☞	✛	☆	✻	✼	❻			♠	❻	❷	➘	➫	➴
C			✌	✜	✯	✼	●	❾			①	❼	❸	➔	➬	➷
D			✍	✝	★	✻	○	❝			②	❽	❹	→	➪	➧
E			✎	✞	★	✽	■	❞			③	❾	❺	→	➪	➠
F			✏	✟	★	✿	❑				④	❿	❻	➞	➪	

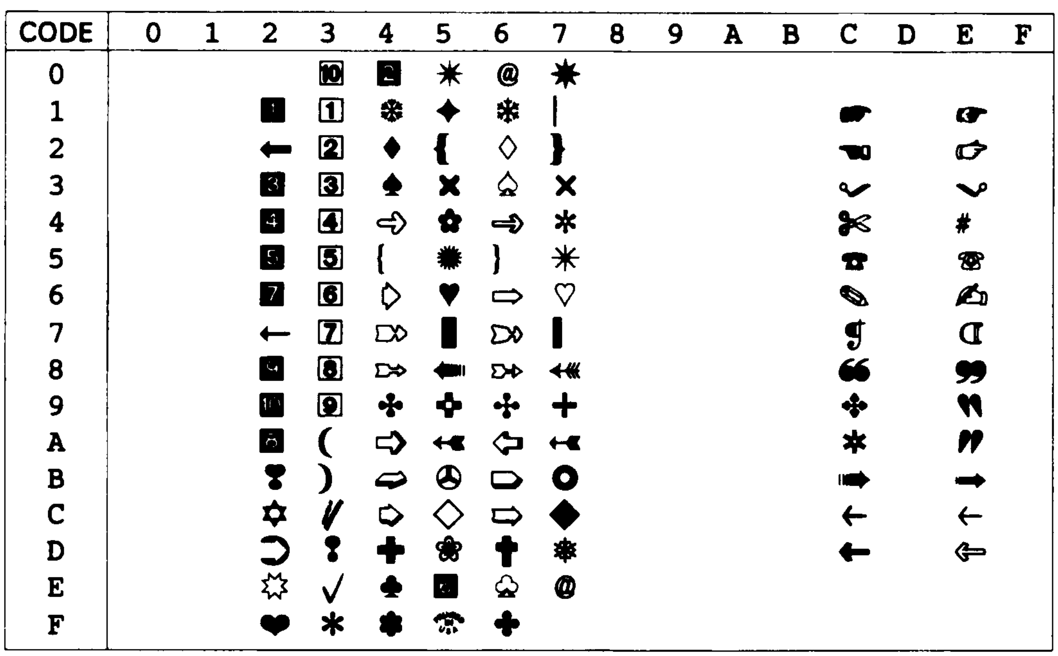
ITC Zapf Dingbats Series 100 (11L)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				⑩	❷	☆	©	✲								
1			❶	①	✯	▲	☆	△					☛		☚	
2			➡	②	→	❩	→	❨					☛		✉	
3			➊	③	➔	†	↞	‡					✂		✁	
4			➍	④	→	★	→	★					✂		✂	
5			➎	⑤	❱	✪	❩	✸					☎		☎	
6			➐	⑥	➔	➛	➔	➛					❡		¶	
7			➡	⑦	→	✚	→	+					❧		❩	
8			➒	⑧	➡	➥	→	➦					❥		❚	
9			➓	⑨	✻	☆	✻	☆					❨		✿	
A			❽	❨	❱	➡	❱	◆					❩		○	
B			✓	❩	→	☆	←	✸					➽		➽	
C			✧	✗	↔	○	↕	●					➼		➼	
D			➢	✓	†	★	✞	★					➽		➽	
E			✈	✗	➔	❻	✘	®								
F			+	§	✶	▶	★									

ITC Zapf Dingbats Series 200 (12L)



ITC Zapf Dingbats Series 300 (13L)



Default Settings

When the printer is initialized, the settings for the HP emulation are reset to the values shown in the table below.

Item	Factory setting	Reset
Paper input	AUTO	SelecType setting
Paper size	Letter (US) or A4 (other)	SelecType setting
Orientation	Portrait	SelecType setting
Copy count		SelecType setting
Page length	66 (US) or 70 (other) lines	Depends on paper size and orientation settings.
VMI	8/48 inch (6 lines per inch)	Page length minus 1 divided by text length values are fixed and depend on the SelecType paper size setting. The page length and text length are measured in inches.
HMI	12/120 inch (10cpi)	Default HMI of the selected font
Top margin	1/2 inch (150 dots)	1/2 inch (150 dots) when SelecType OFFSET is 0.
Text lines	60 (US) or 64 (other) lines	SelecType setting
Text length portrait	60 (US) or 64 (other) lines	SelecType setting
Left margin	Logical page left margin	Logical page left margin
Right margin	Logical page right margin	Logical page right margin
Line termination	CR=CR, LF=LF, FF=FF	CR=CR, LF=LF, FF=FF

Item	Factory setting	Reset
Fonts (both primary and secondary) Symbol set Spacing Pitch Height Style Strokeweight Typeface	 Roman-8 Fixed 10 cpi 12 point Upright Medium Courier	 * * * * * *
Underline	Off	Off
Font ID	0	0
Character code	0	0
Raster graphic resolution	75 dpi	75 dpi
Macro ID	0	0
End of line wrap	Off	Off
Display function	Off	Off
Advanced graphics	H-size=0, V-size=0, ID=0	H-size=0, V-size=0, ID=0

* Font numbers are saved in EEPROM, and font attributes are selected with the SelecType SYMSET option.

HP Emulation Command Summary

This section lists the printer commands supported by HP emulation. For more information on printer commands, see the Hewlett-Packard LaserJet IIP III Printer Technical Reference Manual.

Note:
To use these printer commands, your software package must be capable of passing these non-printable commands to the printer. The method in which each software uses these commands varies from one software to another.

All commands closely emulate the HP LaserJet series III except for the following:

ESC &l # A can be used to select the following eight paper sizes: Executive, Letter, Legal, A4, Monarch, Com-10, International DL, and International C5. This command overrides the PAGE SIZE setting in SelecType. Other paper sizes cannot be specified with this command.

ESC &1#H works differently whether it is used in INPUT AUTO or not. When you set INPUT AUTO, this command can only be used to specify single sheet paper feeding when the value of # is 2,3, or 6. The printer returns to INPUT AUTO with any other values. When you set INPUT STD or OPT, the values for # produce the effects listed in the following table.

#	Epson ActionLaser	HP LaserJet series
0	Eject current page	Eject current page
1	Feed from standard paper bin	Feed from standard tray
2	Feed from standard paper bin	Manual feed
3	Feed from standard paper bin	Envelope feed
4	Feed from optional lower paper cassette	Feed from optional cassette
6	Feed from standard paper bin	—

ESC &1 # P sets the page length and paper size. The paper sizes available with this command are Letter, A4, Legal, and Executive.

The following commands are available in 3/P/Si emulation but not in LJ-2P emulation:

ESC &a#P	Print direction
ESC *b#Y	Raster Y offset
ESC *rC	End raster graphics (Version C)
ESC *r#T	Raster graphics height
ESC *r#S	Raster graphics width
ESC *v#T	Select pattern
ESC *v#N	Select source transparency mode
ESC *v#O	Select pattern transparency mode
ESC %#B	Enter GL/2 mode
ESC *c#K	Plot horizontal size
ESC *c#L	Plot vertical size
ESC *c#T	Set picture frame anchor point
ESC *c#X	Picture frame horizontal size
ESC *c#Y	Picture frame vertical size

Printer commands arranged by topic

The HP printer commands supported in HP LaserJet series emulation are listed below with the name or description, followed by the ASCII value and then the hexadecimal value above the decimal. (The symbol set and GL/2 mode are in a shorter format.)

Note:
To use these printer commands, your software must allow you to do so. Consult your software reference manual or the software technical support department for assistance.

Name or description	ASCII	Hexadecimal Decimal				
PCL mode control codes:						
Backspace	BS	08 008				
Line feed	LF	0A *010*				
Form feed	FF	0C 012				
Carriage return	CR	0D 013				
Shift out (select secondary font)	s o	0E 014				
Shift in (select primary font)	SI	0F 015				
Escape	ES	1B 027				
Horizontal tab	HT	09 009				
Space	SP	20 032				
Orientation:						
Orientation	ESC&1#0	1B 027	26 038	6C 108	# #	4F 079
Print direction (3/P/Si only)	ESC &a#P	1B 027	26 038	61 097	# #	50 080

Name or description	ASCII	Hexadecimal Decimal				
Page length, paper sire, text length:						
Page length	ESC&1#P	1B 027	26 038	6C 108	# #	50 080
Paper size	ESC&1#A	1B 027	26 038	6C 108	# #	41 065
Text length	ESC&1#F	1B 027	26 038	6C 108	# #	46 070
Margins:						
Top margin	ESC&1#E	1B 027	26 038	6C 108	# #	45 069
Set left margin	ESC&a#L	1B 027	26 038	61 097	# #	4C 076
Set right margin	ESC&a#M	1B 027	26 038	61 097	# #	4D 077
Clear side margins	ESC9	1B 027	39 057			
Offset:						
Left offset registration (3/P/Si only)	ESC&1#U	1B 027	26 038	6C 108	# #	55 085
Top offset registration (3/P/Si only)	ESC&1#Z	1B 027	26 038	6C 108	# #	5A 090
Vertical line spacing:						
Set vertical motion index	ESC&1#C	1B 027	26 038	6C 108	# #	43 067
Set lines per inch	ESC&1#D	1B 027	26 038	6C 108	# *#*	44 *68*
Half-line feed:						
Half-line feed	ESC=	1B 027	3D 061			
Specialized printer control:						
Printer reset	ESCE	1B 027	45 069			
Select number of copies	ESC&1#X	1B 027	26 038	6C 108	# #	58 088
Exit LaserJet mode	ESC%#X	1B 027	25 037	# #	58 088	

Name or description	ASCII	Hexadecimal Decimal				
Miscellaneous:						
Horizontal motion index	ESC&k#H	1B 027	26 038	6B 107	# #	48 072
Line termination	ESC&k#G	1B 027	26 038	6B 107	# #	47 071
End of line wrap	ESC &s#C	1B 027	26 038	73 115	# #	43 067
Paper input control	ESC&1#H	1B 027	26 038	6C 108	# #	48 072
Cursor positioning:						
Horizontal (columns)	ESC&a#C	1B 027	26 038	61 097	# #	43 067
Vertical (lines)	ESC&a#R	1B 027	26 038	61 097	# #	52 082
Horizontal (decipoints)	ESC&a#H	1B 027	26 038	61 097	# #	48 072
Vertical (decipoints)	ESC&a#V	1B 027	26 038	61 097	# #	56 086
Horizontal (dots)	ESC*p#X	1B 027	2A 042	70 112	# #	58 088
Vertical (dots)	ESC*p#Y	1B 027	2A 042	70 112	# #	59 089
Underline:						
Enable auto-underlining	ESC &d # D	1B 027	26 038	64 100	# #	44 068
Disable auto-underlining	ESC &d@	1B 027	26 038	64 100	40 064	
Display functions, transparent print data:						
Enable display functions	ESC Y	1B 027	59 089			
Disable display functions	ESC ***Z***	1B 027	5A 090			
Transparent print data	ESC&p#X[data]	1B 027	26 038	70 112	# #	58 088

Name or description	ASCII	Hexadecimal Decimal				
Perforation skip mode:						
Perforation skip mode	ESC&l#L	1B 027	26 038	6C 108	# #	4C 076
Font management:						
Specify font ID	ESC*c#D	1B 027	2A 042	63 099	# #	44 068
Specify character code	ESC*c#E	1B 027	2A 042	63 099	# #	45 069
Font and character control	ESC*c#F	1B 027	2A 042	63 099	# #	46 070
Download character	ESC(s# W[data]	1B 027	28 040	73 115	# #	57 087
Create font (font descriptor)	ESC)s#W[data]	1B 027	29 041	73 115	# #	57 087
Designate downloaded font (primary)	ESC(#X	1B 027	28 040	# #	58 088	
Designate downloaded font (secondary)	ESC)#X	1B 027	29 041	# #	58 088	
Font default (primary)	ESC (3@	1B 027	28 040	33 051	40 064	
Font default (secondary)	ESC)3@	1B 027	29 041	33 051	40 064	
Specify symbol set ID	ESC*c#R	1B 027	2A 042	63 099	# #	52 082
Define symbol set	ESC(f#W[data]	1B 027	28 040	66 102	# #	57 087
Symbol set control	ESC*c#S	1B 027	2A 042	63 099	# #	53 083
Spacing	ESC(s#P	1B 027	28 040	73 115	# #	50 080
Pitch (cpi)	ESC(s#H	1B 027	28 040	73 115	# #	48 072
Point size	ESC(s#V	1B 027	28 040	73 115	# #	56 086
Style	ESC(s#S	1B 027	28 040	73 115	# #	53 083
Stroke weight	ESC(s#B	1B 027	28 040	73 115	# #	42 066

Name or description	ASCII	Hexadecimal Decimal				
Font management: **(continued)**						
Typeface	ESC(s#T	1B 027	28 040	73 115	# #	54 084
Font pitch	ESC&k#S	1B 027	26 038	6B 107	# #	53 083
Macros:						
Macro ID	ESC&f#Y	1B 027	26 038	66 102	# #	59 089
Macro control	ESC&f#X	1B 027	26 038	66 102	# #	58 088
Push/Pop position:						
Push/Pop position	ESC&f#S	1B 027	26 038	66 102	# #	53 083
Rastergraphics:						
Raster graphics resolution	ESC*t#R	1B 027	2A 042	74 116	# #	52 082
Raster graphics presentation	ESC*r#F	1B 027	2A 042	72 114	# #	46 070
Start raster graphics	ESC*r#A	1B 027	2A 042	72 114	# #	41 065
Raster Y offset (3/P/Si only)	ESC*b#Y	1B 027	2A 042	62 098	# #	59 089
Set raster compression mode	ESC*b#M	1B 027	2A 042	62 098	# #	4D 077
Transfer raster graphics	ESC*b#W[data]	1B 027	2A 042	62 098	# #	57 087
Raster graphics height (3/P/Si only)	ESC*r#T	1B 027	2A 042	72 114	# #	54 084
Raster graphics width (3/P/Si only)	ESC*r#S	1B 027	2A 042	72 114	# #	53 083
End raster graphics Version B	ESC *rB	1B 027	2A 042	72 114	42 066	
End raster graphics (3/P/Si only) Version C	ESC*rC	1B 027	2A 042	72 114	43 067	

Name or description	ASCII	Hexadecimal Decimal				
Advanced graphics:						
Select pattern (3/P/Si only)	ESC*v#T	1B 027	2A 042	76 118	# #	54 084
Select source mode (3/P/Si only) transparency	ESC*v#N	1B 027	2A 042	76 118	# #	4E 078
Select pattern mode (3/P/Si only) transparency	ESC*v#O	1B 027	2A 042	76 118	# #	4F 079
Horizontal rectangle size (dots)	ESC *c # A	1B 027	2A 042	63 099	# #	41 065
Vertical rectangle size (dots)	ESC*c#B	1B 027	2A 042	63 099	# #	42 066
Horizontal rectangle size (decipoints)	ESC *c # H	1B 027	2A 042	63 099	# #	48 072
Vertical rectangle size (decipoints)	ESC*c#V	1B 027	2A 042	63 099	# #	56 086
Print graphics	ESC*c#P	1B 027	2A 042	63 099	# #	50 080
Specify graphic pattern	ESC*c#G	1B 027	2A 042	63 099	# #	47 071
Define pattern	Esc*c#W[data]	1B 027	2A 042	63 099	# #	57 087
Set pattern reference point	ESC*p#R	1B 027	2A 042	70 112	# #	52 082
User-defined pattern control	ESC*c#Q	1B 027	2A 042	63 099	# #	51 081
Vector graphics (3/P/Si only):						
Enter GL/2 mode	ESC%#B	1B 027	25 037	# #	42 066	
Plot horizontal size	ESC*c#K	1B 027	2A 042	63 099	# #	4B 075
Plot vertical size	ESC*c#L	1B 027	2A 042	63 099	# #	4C 076
Set picture frame anchor point	ESC *c # T	1B 027	2A 042	63 099	# #	54 084
Picture frame horizontal size	ESC *c # X	1B 027	2A 042	63 099	# #	58 088
Picture frame vertical size	ESC *c # Y	1B 027	2A 042	63 099	# #	59 089

Symbol set selection:	**Primary**	Secondary
HP Math 7	ESC (0A	ESC)0A
HP Line Draw-7	ESC (0B	ESC)0B
HP Large Characters	ESC (0C	ESC)0C
ISO 60: Norwegian v1	ESC (0D	ESC)0D
150 61: Norwegian v2	ESC (1D	ESC)1D
HP Roman Extension	ESC (0E	ESC)0E
ISO 4: United Kingdom	ESC (1E	ESC)1E
ISO 25: French	ESC (0F	ESC)0F
ISO 69: French	ESC (1F	ESC)1F
HP German	ESC (0G	ESC)0G
150 21: German	ESC (1G	ESC)1G
HP Greek8	ESC (8G	ESC)8G
Hebrew-7	ESC (0H	ESC)0H
Hebrew-8	ESC (8H	ESC)8H
ISO 15: Italian	ESC (0I	ESC)0I
Pc Portuguese (CP860)	ESC (33I	ESC)33I
PC Can French (CP863)	ESC(34I	ESC)34I
PC Nordic (CP865)	ESC (35I	ESC)35I
PC USA (CP437)	ESC (39I	ESC)39I
Microsoft Publishing	ESC (6J	ESC)6J
DeskTop	ESC (7J	ESC)7J
Document	ESC (8J	ESC)8J
PS Text	ESC (10J	ESC)10J
Ventura International	ESC (13J	ESC)13J
Ventura US	ESC (14J	ESC)14J
150 41: JIS ASCII	ESC (0K	ESC)0K
ISO 13: Katakana	ESC (1K	ESC)lK
150 57 Chinese	ESC (2K	ESC)2K
Kana-8	ESC (8K	ESC)8K
Korean-8	ESC (9K	ESC)9K
Line Draw-7	ESC (0L	ESC)0L
HP Block Characters	ESC (1L	ESC)1L
Tax Line Draw	ESC (2L	ESC)2L
Line Draw-8	ESC (8L	ESC)8L
Ventura ITC Zapf Dingbats	ESC (9L	ESC)9L
PS ITC Zapf Dingbats	ESC (10L	ESC)10L
ITC Zapf Dingbats Series 100	ESC (11L	ESC)11L
ITC Zapf Dingbats Series 200	ESC (12L	ESC)12L
ITC Zapf Dingbats Series 300	ESC (13L	ESC)13L

Symbol set selection: **(continued)**	**Primary**	**Secondary**
Math-7	ESC (0M	ESC)0M
Tech-7	ESC (1M	ESC)lM
PS Math	ESC (5M	ESC)5M
Ventura Math	ESC (6M	ESC)6M
Math-8	ESC (8M	ESC)8M
ECMA-94 Latin 1 (ISO 8859/1)	ESC (0N	ESC)0N
ECMA-94 Latin 2 (ISO 8859/2)	ESC (2N	ESC)2N
ECMA-128 Latin 5 (ISO 8859/9)	ESC (5N	ESC)5N
ECMA-113/88 Latin/Cyrillic (ISO 8859/5.2)	ESC (10N	ESC)10N
OCRA	ESC (0O	ESC)0O
OCRB	ESC (1O	ESC)1O
OCRM	ESC (2O	ESC)2O
APL (Typewriter paired)	ESC (0P	ESC)0P
APL (Bit paired)	ESC (1P	ESC)lP
Math-8a	ESC (0Q	ESC)0Q
Math-8b	ESC (1Q	ESC)lQ
Pi Font-a	ESC(2Q	ESC) 2Q
OCR-B Extended	ESC (3Q	ESC)3Q
PC LINE	ESC (4Q	ESC)4Q
Cyrillic ASCII (ECMA-113/96, ISO 8859/5)	ESC (0R	ESC)0R
Cyrillic	ESC (1R	ESC)lR
PC Cyrillic	ESC (3R	ESC)3R
ISO 11: Swedish for names	ESC (0S	ESC)0S
HP Spanish	ESC (1S	ESC)lS
ISO 17: Spanish	ESC (2S	ESC)2S
ISO 10: Swedish	ESC (3S	ESC)3S
ISO 16: Portuguese	ESC (4S	ESC)4S
ISO 84: Portuguese	ESC (5S	ESC)5S
ISO 85: Spanish	ESC (6S	ESC)6S
HP European Spanish	ESC (7S	ESC)7S
HP Latin Spanish	ESC (8S	ESC)8S
HP-GL Download	ESC (16S	ESC)16S
HP-GL Drafting	ESC (17S	ESC)17S
HP-GL Special Symbols	ESC (18S	ESC)l8S
Thai-8	ESC (0T	ESC)0T
Turkish-8	ESC (8T	ESC)8T
ISO 6: ASCII	ESC (0U	ESC)0U

Symbol set *selection:* (continued)	**Primary**	**Secondary**
Legal	ESC (1U	ESC)1U
ISO 2: International Reference Version	ESC (2U	ESC)2U
HPL Language Set	ESC (5U	ESC)5U
OEM-l	ESC (7U	ESC)7U
Roman-8	ESC (8U	ESC)8U
Windows	ESC (9U	ESC)9U
PC-8	ESC (10U	ESC)10U
PC-8 D/N (Danish/Norwegian)	ESC (11U	ESC)11U
PC-850	ESC (12U	ESC)12U
Pi Font	ESC (15U	ESC)15U
PC-852	ESC (17U	ESC)17U
Arabic	ESC (0V	ESC)0V
Arabic-8	ESC (8V	ESC)8V
3 of 9 Barcode	ESC (0Y	ESC)0Y
Industrial 2 of 5 Barcode	ESC (1Y	ESC)1Y
Matrix 2 of 5 Barcode	ESC (2Y	ESC)2Y
Interleaved 2 of 5 Barcode	ESC (4Y	ESC)4Y
CODABAR Barcode	ESC (5Y	ESC)5Y
MS1/Plessey Barcode	ESC (6Y	ESC)6Y
Code 11 Barcode	ESC (7Y	ESC)7Y
UPC / EAN Barcode	ESC (8Y	ESC)8Y

GL/2 mode

Configuration and status group:

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

Line and fill attributes group:

Line attributes	LA
Line type	LT
User defined line type	UL
Select pen	SP
Pen width	PW
Pen width unit selection	WU
Fill type	FT
Screened vectors	SV
Raster fill definition	RF
Anchor comer	AC
Symbol mode	SM
Transparency mode	TR

Vector group:

Pen down	PD
Pen up	PU
Plot absolute	PA
Plot relative	PR
Arc absolute	AA
Arc relative	AR
Absolute arc three point	AT
Relative arc three point	RT
Circle	CI
Polyline encoded	PE

Polygon group:

Edge rectangle absolute	EA
Edge rectangle relative	ER
Fill rectangle absolute	RA
Fill rectangle relative	RR
Edge wedge	EW
Fill wedge	WG
Polygon mode	PM
Edge polygon	EP
Fill polygon	FP

Charactergroup:

Standard font definition	SD
Alternate font definition	AD
Primary font (stantard font)	FI
Secondary font (alternate font)	FM
Select standard font	SS
Select alternate font	SA
Scalable or bitmap font	SB
Absolute direction	DI
Relative direction	DR
Absolute character size	SI
Relative character size	SR
Character slant	SL
Character fill mode	CF
Label	LB
Define label terminator	DT
Label origin	LO
Define variable text path	DV
Extra space	ES
Character plot	CP
Transparent data	TD

Dual context extension:

Enter PCL mode	ESC %A
Reset	ESCE

Printer Job Language (PJL):

ESC %-12345X	Universal exit language/Start of PJL
@PJL ENTER LANGUAGE = PCL <LF>	Enter PCL
@PJL ENTER LANGUAGE = PostScript < LF >	Enter PostScript
@PJL Comment [Comment String] < LF >	Comment Command

Epson GL/2 Mode

Introduction

Epson GL/2 mode features some plotter commands. In this mode, you can use your printer with plotter applications.

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

This mode is available only with ActionLaser 1500 or the upgraded ActionLaser 1000 with the PCL5/RITech board.

Epson GL/2 mode is similar to GL/2 mode included in the HP LaserJet III emulation. The table below shows the differences between Epson GL/2 mode and GL/2 mode included in the HP LaserJet III emulation.

	EpsonGL/2	HP LaserJet III
PCL mode	Does not exist	Exists as the initial mode
Paper eject	Supports PG. AF commands	Supported in PCL
Auto eject	SelecType setting	Not available
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, EJL, and ES	Supported	Supported
Advance Full Page (PG. AF)	Supported	Not supported

Using the SD and AD commands, you can select all the fonts available in HP LaserJet III emulation.

Two modes of Epson GL/2

Epson GL/2 mode has two operational modes. One is the LJ3-GL/2 mode, another is the GL-like mode.

- ❑ LJ3-GL/2 mode
  This mode emulates GL/2 mode of the HP LaserJet series III emulation. While in this mode you can enter GL/2 mode without sending the ESC %#B (Enter GL/2 mode) command. If your application software cannot send the ESC %#B command, then use this mode.

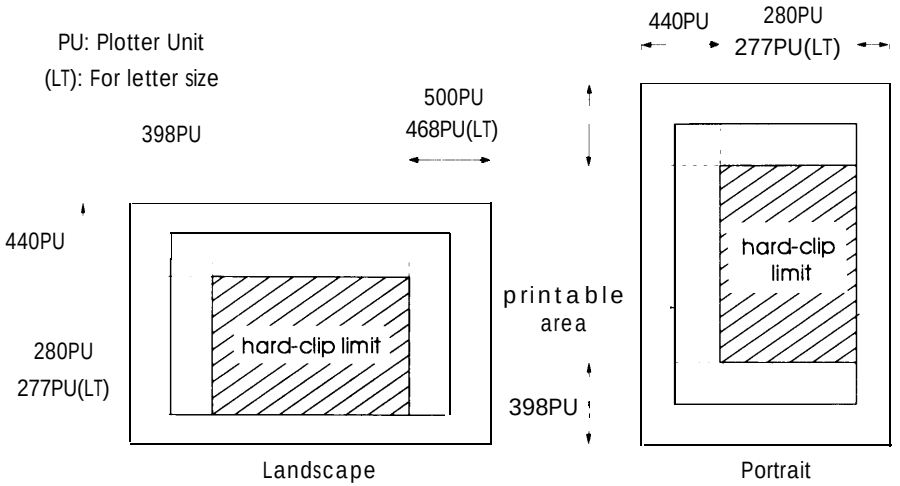
  If your application software supports LaserJet series printers, you do not need to use this mode.

- ❑ GL-like mode
  This mode emulates some of the HP-GL® plotter commands. It features all of the commands of the LJ3-GL/2 mode, plus two additional commands.

The table below shows the differences of these modes.

	LJ3-GL/2 mode	GL-like mode
Plotter unit	1/1016 inch	1/1021 inch
Printable areas (Picture frame)	Same as LaserJet III 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

. The area of hard-clip limit is on the next page.



SelecType options

This section lists the menus and options available when you use SelecType Level 1 in Epson GL/2 mode.

The menus are as follows:

INPUT*
PAGE SIZE”
COPY”
STATUS SHEET*
SUB CONFIG.*
SYSTEM CONFIG.*

* See Chapter 4 for information about these menus.

In Epson GL/2 mode, the SUB CONFIG. option includes eight submenus.

Menu/submenu	Available options
♦ **SUB CONFIG.**	▶ **EMUL.** **ORIENT.** **SCALE** **ORIGIN** **PEN** **END** **JOIN** **AUTOEJECT**

EMUL.-Selects the mode LJ3-GL/2 or GL-like.

Menu/submenu		Available options
EMUL.	♦ **LJ3=GL/2**	▶ **LJ3=GL/2 *** **GL-like**

ORIENT.-Determines the rotation of **the** coordinate system.

Menu/submenu		Available options
ORIENT.	♦ **PORT**	▶ **PORT** • **(portrait)** **LAND** (landscape)

If you select GL-like mode in EMUL., this option is always set to LAND.

SCALE-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.

Menu/submenu			Available options
SCALE	♦ **OFF**	▶	**OFF"** **A0, A1, A2, A3** or **A4 (to XXX)*** **LT** (to XXX)*

- XXX is the setting that you set with PAGE SIZE option. You cannot set the SCALE option to same size as PAGE SIZE

ORIGIN-Sets the origin for the plotter-unit coordinate system; to the lower left corner (CORNER) or to the center of the hard-clip limit (CENTER).

Menu/submenu			Available options
ORIGIN	♦ **CORNER**	▶	**CORNER*** **CENTER**

PEN-Selects the pen and its line width.

First, you can select the pen using a number, as indicated with the underline.

Menu/submenu			Available options
PEN → **0 X.XXmm**		▶	0 (white) • **1 (black)**

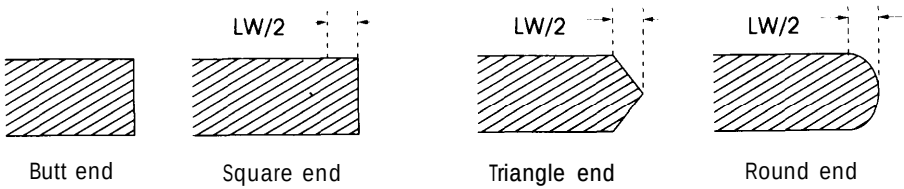
Then, you can select the pen line width (the number indicated with the underline) in increments of 0.05 mm, in a range from 0.05 mm to 5.00 mm.

Menu/submenu			Available options
PEN X	♦ **2.50mm**	▶	**0.05mm to 5.00mm**

END-Determines the type of line-ending.

Menu/submenu		Available options
END	♦ **BUTT**	▶ **BUTT***
		SQUARE
		TRIANGLE
		ROUND

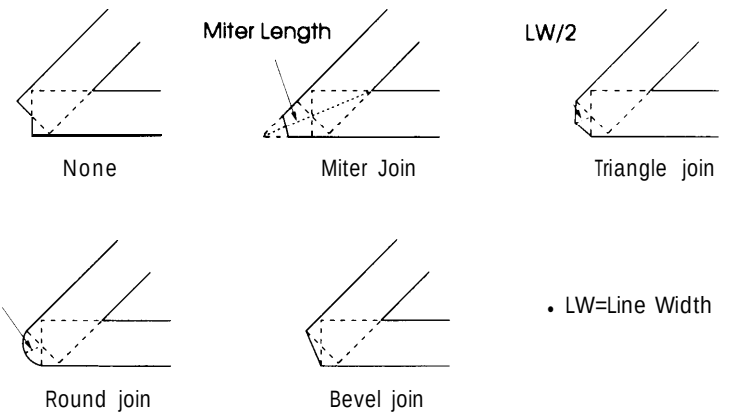
Option of the END	Type of end	Function
BUTT	Butt end	No addition
SQUARE	Square end	Adds a square end with a length of half the line width
TRIANGLE	Triangular end	Adds a triangular end with a length of half the line width
ROUND	Round end	Adds a semicircular end with a radius of half the line width



JOIN-Defines the join shape.

Menu/submenu		Available options
JOIN	♦ **MITER**	▶ **MITER***
		M/B
		TRIANGLE
		ROUND
		BEVEL
		NONE

Option of the JOIN	Type of joining	Function
NONE	None	No effect
MITER	Miter join	Line endings are either pointed or pointed with the end cut off
M/B	Miter/Bevel join	Line endings are pointed or filled in depending on the miter level
TRIANGLE	Triangle join	Line endings are bluntly pointed
ROUND	Round join	Line endings are round
BEVEL	Bevel join	Line endings are tilled in



AUTOEJECTDetermines the timing of the auto eject function. If OFF, the paper does not auto eject. Otherwise, the paper ejects within the specified time period if no data is received.

Menu/submenu	Available options
AUTOEJECT ♦ OFF	**▶ OFF***
	10 to 60

Epson GL/2 mode commands summary

LJ3=GL/2 mode

Configuration and status group:	
IP	Input P1 and P2
IR	Input relative P1 and P2
SC	Scale
IW	Input window
RO	Rotate coordinate system
IN	Initialize
DF	Default values
PG	Advance full page
AF	Advance full page
Line and fill attributes group:	
LA	Line attributes
LT	Line type
UL	User defined line type
SP	Select pen
PW	Pen width
WU	Pen width unit selection
FT	Fill type
SV	Screened vectors
RF	Raster fill definition
AC	Anchor comer
SM	Symbol mode
TR	Transparency mode
Vector group:	
PD	Pen down
PU	Pen up
PA	Plot absolute
PR	Plot relative
AA	Arc absolute
AR	Arc relative
AT	Absolute arc three point
RT	Relative arc three point
CI	Circle
PE	Polyline encoded

Polygon group:

EA	Edge rectangle absolute
ER	Edge rectangle relative
RA	Fill rectangle absolute
RR	Fill rectangle relative
EW	Edge wedge
WG	Fill wedge
PM	Polygon mode
EP	Edge polygon
FP	Fill polygon

Charactergroup:

SD	Standard font definition
AD	Alternate font definition
FI	Primary font (standard font)
FN	Secondary font (alternate font)
SS	Select standard font
SA	Select alternate font
SB	Scalable or bitmap font
DI	Absolute direction
DR	Relative direction
SI	Absolute character size
SR	Relative character size
SL	Character slant
CF	Character fill mode
LB	Label
DT	Define label terminator
LO	Label origin
DV	Define variable text path
ES	Extra space
CP	Character plot
TD	Transparent data

Dual context extension:

ESC E	Reset

GL -Like mode

The following two commands are added to LJ3-GL/2 mode.

CS	Designate standard character set
CA	Designate alternate character set

Available symbol sets for these commands:

ASCII, JIS ASCII, Roman Extension, Katakana, International Reference Version, Swedish, Swedish for Names, Danish/Norwegian, German, French, United Kingdom, Italian, Spanish, Portuguese, Norwegian Version 2

Appendix C

LQ and FX Emulation Modes

Introduction

Your printer has the ability to emulate an Epson LQ-2500, FX-800/1000, or FX-86e/286e printer. This means that you can use your printer with software that supports only Epson LQ or FX printers and print without having to modify the software controlling your printer.

Besides allowing you to use software for LQ or FX printers, you also gain the advantages of the quality text, sharper graphics, and faster printing provided by this printer.

Operating as an LQ or FX printer

Before you can operate your printer as an LQ or FX printer, you need to change the printer emulation setting using the EMULATION menu in SelecType Level 2. See Chapter 4 for details on using SelecType.

Operating the printer in LQ or FX emulation offers options not available with most LQ or FX printers, including SelecType control over almost all printer features and laser quality output.

SelecType Options

This section lists unique menus and options available when you use SelecType in either LQ or FX emulation. See Chapter 4 for more information on SelecType.

ORIENT.

The orientation option selects the direction in which the characters are printed on a page. You can choose portrait (vertical) or landscape (horizontal) orientation.

Menu/submenu		Available options
♦ **ORIENT.**	**PORT**	▶ **PORT (Portrait)**
		LAND (Landscape)

FONT

The FONT options selects a font by typeface.

Menu/submenu		Available options
♦ **FONT**	**COURIER**	▶ **Courier**
		Prestige
		DL

The factory setting is Courier. After selecting the desired font, you can also adjust the character spacing and size of the font with the PITCH and CONDENSED settings in the SUB CONFIG. option submenu.

Note:
Resident and optional fonts specially designed for the HP emulation cannot be used in the LQ or FX emulations.

SUB CONFIG.

When you set up your printer to operate in LQ or FX emulation, the SUB CONFIG. option includes the submenus shown below:

Menu/submenu	Available options	
♦ **SUB CONFIG.**	▶ **PITCH**	**CGTABLE**
	CONDENSED	**COUNTRY**
	L-MARGIN	**J-REPRINT**
	R-MARGIN	**AUTO CR**
	T-MARGIN	**ZERO CHAR**
	TEXT	**WIDE PAGE**
	SKIPBOTTOM	**B-IMAGE**

PITCH-You can select a character pitch of 10,12, or 15 characters per inch (cpi), or choose proportional spacing.

Menu/submenu		Available options
♦ **PITCH**	**10 CPI** ▶	**10, 12, 15, or PROP**

CONDENSED-Use this option to change 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.

Menu/submenu		Available options
♦ **CONDENSED OFF**	↗	OFF or ON

L-MARGIN-Use this option to set the left margin. Margin units are determined by the current pitch (characters per inch) and the condensed setting (ON or OFF). The factory setting is 0.

Menu/submenu			Available options
♦ **L-MARGIN**	**0**	▶	0 to available

If you select proportional, 10 cpi and condensed, determine margin units. If you change the setting of ORIENT., PAGE SIZE, or WIDE PAGE (when PAGE SIZE is set to A4 or F4), the left margin defaults to 0.

R-MARGIN-Use this option to set the right margin. Margin units are determined by current pitch (characters per inch) and the condensed setting (ON or OFF). The factory setting is 80.

Menu/submenu		Available option
♦ **R-MARGIN**	80	▶ 1 to available

If you select proportional, 10 cpi and condensed, determine margin units. If you change the setting of ORIENT., PAGE SIZE, or WIDE PAGE (when PAGE SIZE is set to A4 or F4), the right margin defaults to the setting in the following table:

Paper size	Condensed	Portrait			Landscape		
		10 cpi	12 cpi	15 cpi	10 cpi	12 cpi	15 cpi
A4	OFF	77	93	116	111	134	167
	ON	133	155	116	191	223	167
A4 (80 col)	OFF	80	96	120	111	134	167
	ON	137	160	120	191	223	167
A5	OFF	53	63	79	77	93	116
	ON	91	106	79	133	155	116
B5	OFF	66	80	100	96	115	144
	ON	114	133	100	164	192	144
Letter	OFF	80	96	120	105	126	157
	ON	137	160	120	180	210	157
Legal	OFF	80	96	120	155	162	202
	ON	137	160	120	231	270	202
Half Letter	OFF	50	60	75	80	96	120
	ON	85	100	75	137	167	120
Executive	OFF	67	81	101	100	120	150
	ON	115	135	101	171	200	150

Paper size	Condensed	Portrait			Landscape		
		10 cpi	12 cpi	15 cpi	10 cpi	12 cpi	15 cpi
G Legal	OFF	80	96	120	125	150	187
	ON	137	160	120	214	250	187
G Letter	OFF	75	90	112	100	120	150
	ON	125	150	112	171	200	150
F4	OFF	77	93	116	124	149	187
	ON	133	155	116	214	249	187
F4 (80 col)	OFF	80	96	120	124	149	187
	ON	137	160	120	214	249	187

T-MARGIN-Use this option to specify the distance from the top of the sheet to the baseline of the first printable line. This is measured in 0.05-inch increments. The factory setting is 0.50 inches.

Menu/submenu		Available options
♦ **T-MARGIN**	**0.50**	▶ **0.50-150** (inch)

TEXT-Use this option to set the page length. The unit of measure for this option is 1/6th of an inch. The factory setting is 66 (line spacing is 6 lines per inch).

Menu/submenu		Available options
♦ **TEXT**	**66LINES**	▶ **1** to available

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

SKIPBOTTOM-When you set SKIPBOTTOM to ON, the printer inserts the number of line spaces specified by the ESC N (skip over perforation) command between the last line printed on the page and the first printable line on the next page. The total number of lines skipped equals the T-MARGIN setting plus the amount of skip over perforation set with ESC N. Since most application programs insert their own top and bottom margins, use this feature only if your program does not provide them.

Menu/submenu	Available options
♦ **SKIPBOTTOM OFF**	▶ **ON** or **OFF**

CGTABLE-Use the character generator table option to select the graphics character table, the italics table, or the download table. The graphics table contains graphic characters for printing lines, corners, 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. The download table is not available when you are in FX emulation mode.

Menu/submenu		Available options	
♦ **CGTABLE**	**PcUSA**	▶ **PcUSA**	**PcNord**
		PcMulti	**DLoad**
		PcPort	**ITALIC**
		PcCanF	

COUNTRY-Use this option to select one of the thirteen international symbol sets. See Available Fonts and Character Tables later in this appendix for samples of the characters in each country symbol set.

Menu/submenu			Available options	
♦ **COUNTRY**	**USA**	▶	**USA**	**Spain1**
			France	**Japan**
			German	**Norway**
			UK	**Denmk2**
			Denmark	**Spain2**
			Sweden	**LatinA**
			Italy	

J-REPRINT-Use this option to reprint after a paper jam. When it is set to ON and a page jams in the printer, the page is reprinted after you clear the jam. If this option is set to OFF, the jammed page does not reprint automatically, but complex pages may print faster.

Menu/submenu			Available options
♦ **J-REPRINT**	**OFF**	▶	ON or OFF

AUTO CR-Use the automatic carriage return option to perform a carriage-return line-feed (CR-LF) operation whenever the print position exceeds the right margin. If AUTO CR 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.

Menu/submenu			Available options
♦ **AUTO CR**	**ON**	▶	ON or OFF

ZERO CHAR-This option determines whether the printer prints a slashed zero (Ø) 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.

Menu/submenu		Available options
♦ ZERO CHAR	0 ▶	Ø or 0

WIDE PAGE-When this option is ON, you can print up to 80 characters at 10 cpi across an A4- or F4-size page. When it is OFF, you can print up to 77 characters at 10 cpi. This setting is valid only when PAGE SIZE is set to A4 or F4. If you change the WIDE PAGE setting when sizes other than A4 or F4 are selected with the PAGE SIZE option, L-MARGIN automatically defaults to 0 and the R-MARGIN and the TEXT LINES return to the default setting for the currently selected paper size.

Menu/submenu	Available options
♦ WIDE PAGE ON	▶ ON or OFF

B-IMAGE-With B-IMAGE 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.

Menu/submenu		Available options
♦ B-IMAGE	DARK ▶	DARK LIGHT BCODE

The BCODE setting converts bit images 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 bit image graphics.

Available Fonts and Character *Tables*

This section describes the resident fonts and character tables available in the LQ and FX emulations.

Resident fonts

The printer offers a variety of resident fonts in the LQ and FX emulations. The following table lists the resident fonts available in the LQ and FX emulations and shows samples of text printed with them.

Font name	Pitch (cpi)	Orientation	Sample
Courier	10	Portrait	**ABCDEFGHIabcdefg012345**
Courier bold	10	Portrait	**ABCDEFGHIabcdefg012345**
Courier	12	Portrait	**ABCDEFGHIJabcdefghij012345**
Courier bold	12	Portrait	**ABCDEFGHIJabcdefghij012345**
Line printer	16.66	Portrait	ABCDEFGHIJKLMNabcdefghijklmn0123456789
Prestige	12	Portrait	ABCDEFGHIJabcdefghij012345
Prestige	20	Portrait	ABCDEFGHIJKLMNabcdefghijklmn0123456789

- Using your application program. you can make the bold font for Prestige 12 and 20.
- Using your application program, you can make all fonts italics.

Character tables

This section provides character tables for the character sets available in the LQ and FX emulations. The tables show both the characters and their hexadecimal values.

Epson Italic Character Table

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				*0*	*@*	*P*	`	*p*
1			!	1	A	Q	a	q			*!*	*1*	*A*	*Q*	*a*	*q*
2			"	2	B	R	b	r			*"*	*2*	*B*	*R*	*b*	*r*
3			#	3	C	S	c	s			*#*	*3*	*C*	*S*	*c*	*s*
4			$	4	D	T	d	t			*$*	*4*	*D*	*T*	*d*	*t*
5			%	5	E	U	e	u			*%*	*5*	*E*	*U*	*e*	*u*
6			&	6	F	V	f	v			*&*	*6*	*F*	*V*	*f*	*v*
7			'	7	G	W	g	w			*'*	*7*	*G*	*W*	*g*	*w*
8			(	8	H	X	h	x			*(*	*8*	*H*	*X*	*h*	*x*
9			)	9	I	Y	i	y			*)*	*9*	*I*	*Y*	*i*	*y*
A			*	:	J	Z	j	z			*	*:*	*J*	*Z*	*j*	*z*
B			+	;	K	[	k	{			*+*	*;*	*K*	*[*	*k*	*{*
C			,	<	L	\	l	¦			*,*	*<*	*L*	**	*l*	*¦*
D			-	=	M	]	m	}			*-*	*=*	*M*	*]*	*m*	*}*
E			.	>	N	^	n	~			*.*	*>*	*N*	*^*	*n*	*~*
F			/	?	O	_	o				*/*	*?*	*O*	*_*	*o*	

Note:
You can print italics when either the italic character table or the extended graphics character table is selected.

Epson Extended Graphics Character Table

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ü	æ	í	▒	┴	╤	β	±
2			"	2	B	R	b	r	é	Æ	ó	▒	┬	╥	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	▒	├	╙	π	≤
4			$	4	D	T	d	t	ä	ö	ñ	▒	─	╘	Σ	⌠
5		§	%	5	E	U	e	u	à	ò	Ñ	▒	┼	╒	σ	⌡
6			&	6	F	V	f	v	å	û	ª	▒	╞	╓	μ	÷
7			'	7	G	W	g	w	ç	ù	º	▒	╟	╫	τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿	▒	╚	╪	Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐	▒	╔	┘	θ	∙
A			*	:	J	Z	j	z	è	Ü	¬	▒	╩	┌	Ω	·
B			+	;	K	[	k	{	ï	¢	½	▒	╦	█	δ	√
C			,	<	L	\	l	¦	î	£	¼	▒	╠	▐	∞	^{n}
D			−	=	M	]	m	}	ì	¥	¡	▒	═	▌	ø	^{2}
E			.	>	N	^	n	~	Ä	₧	«	▒	╬	▄	∈	■
F			/	?	O	_	o		Å	ƒ	»	▒	╧	▀	∩	

Epson International Character Sets

	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
U.S.A	#	$	@	[	\	]	^	‘	{	¦	}	~
France	#	$	à	°	ç	§	^	‘	é	ù	è	¨
Germany	#	$	§	Ä	Ö	Ü	^	‘	ä	ö	ü	ß
United Kingdom	£	$	@	[	\	]	^	‘	{	¦	}	~
Denmark I	#	$	@	Æ	Ø	Å	^	‘	æ	ø	å	~
Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spain I	₧	$	@	¡	Ñ	¿	^	‘	¨	ñ	}	~
Japan(English)	#	$	@	[	¥	]	^	‘	{	¦	}	~
Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain II	#	$	á	¡	Ñ	¿	é	‘	í	ñ	ó	ú
Latin America	#	$	á	¡	Ñ	¿	é	ü	í	ñ	ó	ú

Default Settings

When the printer is initialized, the settings for the LQ and FX emulations are reset to the values shown in the table below.

Item	Factory setting	Reset value
Paper input	Standard paper bin	SelecType setting
Paper size	A4	SelecType setting
Page length	66 lines	Depends on the paper size and orientation settings
Top of form	0.5 inch	SelecType setting
Left margin	Left edge of the printable area	SelecType setting or left edge of the printable area
Right margin	80 columns (10 cpi)	Depends on the default right margin set with SelecType
Horizontal tab settings	Every eight characters. (The character width is 10 cpi.)	Every eight characters. (The character width depends on the SelecType condensed print menu setting.)
Vertical tab settings	Every 1/6 inch	Every 1/6 inch
VFU channel	Channel 0	Channel 0
Character spacing	10 cpi	Depends on the condensed print menu setting
International character set	USA	SelecType setting
Typeface	Courier	SelecType setting
Proportional spacing	Fixed	SelecType setting
Character table (ESC t)	On (ESC t1)	SelecType setting
Condensed	Off	SelecType setting

Item	Factory setting	Reset value
Underline, Superscript, Subscript, Double-width, Bold	Off	Off
Italic	Upright	Upright
Intercharacter spacing	0	0
Justification	Off	Off
DC 1, DC 3	DC 1	DC 1
MSB	Enable	Enable

LQ and FX Emulation *Command Summary*

This section lists the control codes and escape sequences supported in the LQ and FX emulations. Some LQ 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.

The following commands are either not available or are ignored in the LQ or FX emulation:

ESC<	Unidirectional mode (one line)
ESC8	Disable paper end detector
ESC9	Enable paper end detector
ESCU	Select print direction
ESCs	Set/cancel half-speed printing
ESCr	Select color printing
ESCi	Incremental view
ESCe	Set increment tab
ESCf	Vertical/parallel skip
ESC (-	Select line
ESC q	Select style
CAN	Cancel line

The following commands are available in FX emulation but not in LQ emulation:

ESC1	7/72-inch line feed
ESC^	Select 9-pin graphics mode
ESCI	Select character code table

The following commands are available in LQ emulation but not in FX emulation:

ESC+	Select n/360-inch line spacing

The printer commands listed below function in a slightly different way when used in the LQ or FX emulations. Also, many of the commands that control the print position use approximations because of the difference in print density between the LQ and FX printers.

ESCG/ESCE

These commands produce identical bolding effects on your printer. On an actual LQ series printer, these two commands create slightly different effects and can be combined to produce darker characters.

SI/ESC SI

These commands print 10 cpi characters in a 16.66 cpi font, and 12 cpi characters in a 20 cpi font. On an actual LQ/FX series printer, these commands condense the font.

ESC x

This command is normally used to select between draft and LQ quality with an LQ or FX printer. However, this command has no effect on your printer's print quality since all characters are printed at 300 dpi (dots per inch).

ESC w

This command produces double-height characters but differs between LQ and FX emulations, as follows:

LQ emulation-If you send the ESC w command when the printer position is set at the first line of the logical page, LQ printers print only the bottom half of the characters. Your printer prints the entire characters.

FX emulation-When combining ESC w and ESC W to produce double width, double-height characters, FX printers do not increase the stroke weight for vertical lines. Your printer in FX emulation does increase the vertical line width. Also, when this command is sent with the print position set at the first line of the page, FX printers change the baseline position in order to print the entire character. For your printer, the baseline is not changed.

ESC &, ESC K, ESC L, ESC Y, ESC Z, ESC, and ESC ^*

This printer uses an image processing technique that emulates, as closely as possible, the image densities available on FX and LQ printers. Because of this process, the graphics commands listed above do not produce exactly the same output on this printer that they would on an FX or an LQ printer.

ESC C, ESC C0

When you send the ESC or ESC CO command to change the page length on the LQ or FX printers, you can print more than one page on the same sheet of paper. Because your printer processes data page-by-page, each page must be printed on a separate sheet of paper, so exact LQ or FX emulation cannot be provided. Problems will occur when the page length set with the ESC C or ESC CO command differs from the actual page length.

DEL

The printer handles the DEL command as a BS command. Print portion return is the same as for an FX or LQ printer, although your printer does not clear previous characters.

ESC EM

Your printer supports 1,2, and R for *n*.

Printer commands arranged by topic

The following section lists and describes all FX and LQ commands by topic.

Printer operation:

ESC@	Initialize printer
DC1	Select printer
DC3	Deselect printer
ESC EM	Control paper loading/ejecting
BEL	Beeper

Data control:

CR	Carriage return
DEL	Delete character
ESC=	Set MSB to 0
ESC>	Set MSB to 1
ESC#	Cancel MSB control

Vertical motion

FF	Form feed
ESCC	Set page length in lines
ESC CO	Set page length in inches
ESCN	Set skip over perforation
ESCO	Cancel skip over perforation
LF	Line feed
ESC0	Select 1/8inch line spacing
ESC1	Select 7/72-inch line spacing
ESC2	Select 1/6-inch line spacing
ESC3	Select n/180-inch line spacing (LQ) Select n/216-inch line spacing (FX)

Vertical motion: (continued)

ESCA	Select n/60-inch line spacing (LQ) Select n/72-inch line spacing (FX)
ESC+	Select n/360-inch line spacing (LQ only)
ESCJ	Perform n/180-inch line feed (LQ) Perform n/216-inch line feed (FX)
ESCj	Perform n/216-inch reverse feed (FX)
VT	Tab vertically
ESCB	Set vertical tabs
ESCb	Set vertical tabs in channel
ESC/	Select vertical tab channel

Horizontal motion:

Margins	
ESC$	Set absolute horizontal print position
ESC\	Set relative horizontal print position
ESC1	Set left margin
ESCQ	Set right margin
BS	Backspace
HT	Tab horizontally
ESCD	Set horizontal tabs

Overall printing sty/e:

ESCx	Select letter quality or draft
ESCk	Select typestyle family
ESC!	Master select

Print size and character width:

ESCg	Select 15 cpi
ESCP	Select 10 cpi
ESCM	Select 12 cpi
ESCp	Turn proportional mode on/off
SI	Select condensed mode
ESC SI	Select condensed mode
DC2	Cancel condensed mode
SO	Select double-width mode (one line)
ESC SO	Select double-width mode (one line)
DC4	Cancel double-width mode (one line)
ESCW	Turn double-width mode on/off
ESCw	Turn double-height mode on/off

Font enhancement:

ESCE	Select emphasized mode
ESCF	Cancel emphasized mode
ESCG	Select double-strike mode
ESCH	Cancel double-strike mode
ESCS	Select superscript/subscript mode
ESCT	Cancel superscript/subscript mode
ESC4	Set italic mode
ESC5	Cancel italic mode
ESC-	Turn underline mode on/off

Word processing:

ESCa	Select justification
ESC SP	Set intercharacter space

Character handling:

ESCt	Select character table
ESCR	Select an international character set
ESC&	Define user-defined characters
ESC:	Copy ROM to RAM
ESC %	Select user-defined set
ESCI	Printable code area expansion (FX only)
ESC6	Enable printable characters
ESC7	Enable upper control code

Graphics:

ESCK	Select singledensity graphics mode
ESCL	Select double-density graphics mode
ESCY	Select high-speed double-density graphics mode
ESCZ	Select quadruple-density graphics mode
ESC*	Select graphics mode
ESC?	Reassign graphics mode
ESC^	Select 9-pin graphics mode (FX only)

Glossary

application program

Any software program designed to carry out a particular task. For example, word processing and graphics packages are application programs.

ASCII

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

baud rate

A measure of the speed of data transmission. It is used when setting up the serial interface on the computer and printer.

bit

A binary digit (0 or l), which is the smallest unit of information used by a printer or computer.

bitmap font

A font that has already been defined with specific attributes such as size and weight. *See also outline font.*

bold

A print enhancement that produces darker than normal characters and is typically used to add emphasis to a document. Bold is also offered as a font attribute. See also *weight.*

buffer

See memory.

byte

A unit of information consisting of eight bits. A byte usually corresponds to one character or code.

cache

The area of memory that stores internally generated fonts.

character set

A collection of letters, numbers, and symbols.

character spacing

Refers to two methods for horizontal character placement: fixed-pitch and proportional spacing.

characters per inch (cpi)

A measure of the size of fixed-pitch 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.

data dump mode

See hex dump mode.

default

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

download font

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

dpi

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

driver

The part of an application 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.

electrophotographic process

The printing method used by your printer. In this process, a low-power laser is used to expose selected portions of a revolving photosensitive drum. Toner is then attracted to the exposed areas of the drum to form a mirror image of the page to be printed. The toner adhering to the drum is then transferred to the surface of the paper where it is fused in place using a process combining heat and pressure.

ESC (escape) code

A special control code used to begin most printer commands.

feature print

A method of checkingthe operation of the printer. When a feature print is performed with the SelecType, the printer prints out the printer's features.

fixed pitch

Refers to the character spacing of a font in which the width is the same for all characters, as distinguished from proportional spacing. For fixed-pitch fonts, narrow characters such as lowercase i take up as much space as wider characters such as uppercase W.

font

The complete character set of a given design and size. A font is specified by the following parameters: orientation, symbol set, spacing, pitch, point size, typeface, style, and weight.

hex dump mode

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

identify (IC) cards

Optional cards that can be plugged into the printer's card slot. They contain different printer emulations (operating modes) so that your printer can emulate another printer.

imaging cartridge

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

initialization

Returns the printer to its defaults (fixed set of conditions).

input buffer

A portion of RAM used as a temporary holding area for data received from the computer until it is printed. Also known as printer memory.

interface

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

italic

A typestyle in which the characters slant. *This sentence is italicized.*

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.

LCD

Liquid Crystal Display. The screen on the control panel that displays the printer's current status or available options or available settings.

line space

The distance between lines of text.

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 download fonts and graphics) is stored temporarily until it is printed out. See also RAM, and *ROM*.

nonvolatile memory

The portion of the printer's memory that is not lost when you turn off the printer.

off line

When the printer is off line, it cannot communicate with the computer.

on line

When the printer is on line, it 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

See scalable font.

parallel interface

See interface.

parity

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

pitch

A measure of character width. Characters can be fixed pitch, where the width is the same for all characters, or proportionally spaced, with varying widths. Pitch is a measure of the number of characters per inch (cpi) for fixed-pitch fonts.

point size

The height of a particular typeface 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 can emulate existing printers, such as LaserJet IIP, LaserJet III, LQ, and FX.

proportional spacing

Printing in which character width varies from character to character. For example, a capital W receives much more space than a lowercase i. The result looks more like a typeset book than a typewritten draft.

RAM

Random Access Memory. The portion of the printer's memory used as an input buffer and for storing user-defined characters, downloaded fonts, and graphics images. Information stored in RAM is volatile and is lost when printer power is interrupted.

reset

To return a printer to its defaults, either by a command, interface signal, RESET button, or by turning the printer off and on.

RITech

Resolution Improvement Technology. This feature makes the jagged edge of printed lines or shapes smooth.

ROM

Read Only Memory. The portion of the printer's memory that is permanent. Information stored in ROM is used to control how the printer operates. Resident fonts are also stored in ROM.

scalable font

A font defined by mathematical equations. Scalable fonts allow certain attributes, such as size and orientation, to be changed. Also called outline font.

SelecType

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

serial interface

See interface.

status sheet

A report that lists the settings and other printer information. You can print this report using the SelecType feature.

symbol set

A collection of symbols (letters, numbers, and special characters) used by a font. Symbols are assigned to specific codes in a character table.

toner

A dry, powder-like substance composed of resin and pigment. Toner is used to form the image during the printing process.

typeface

A set of characters all of a single design in which the characters share common features such as body shape. The typeface is given a name such as Courier.

weight

The boldness or thickness of a character. Weight is selected as a font parameter.

Index

R

S

T

U

V

W

X

EPSON® ActionLaser™
1000/1500

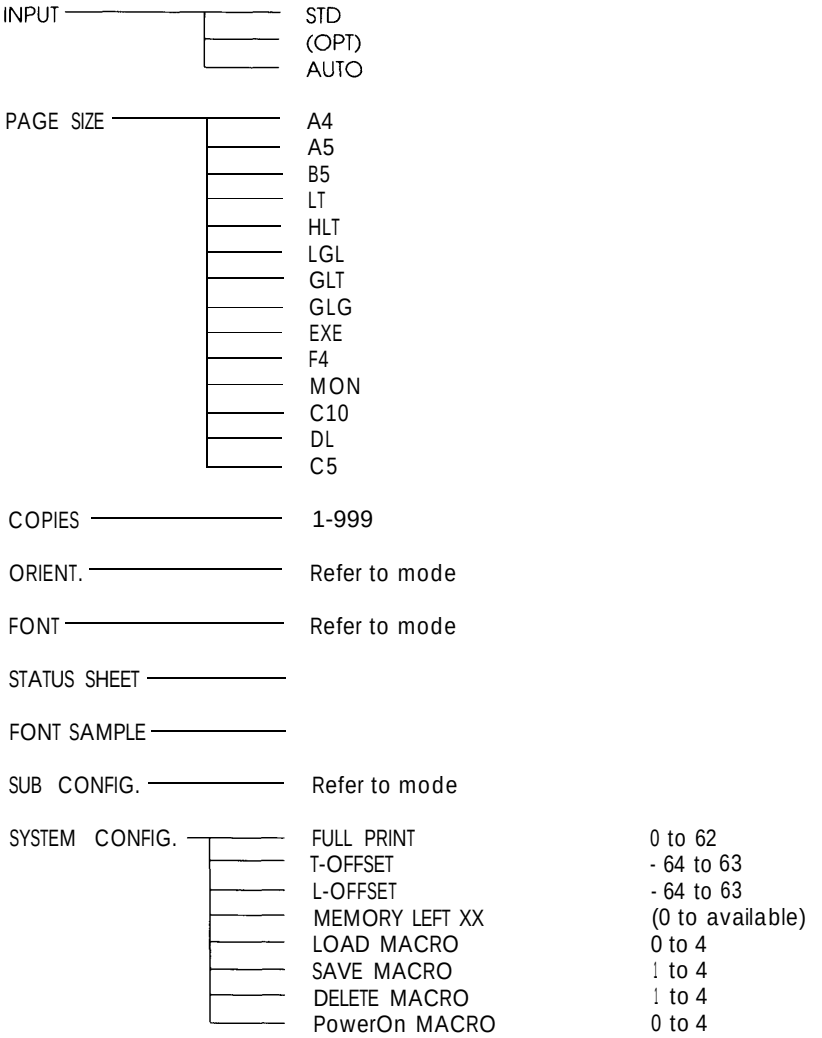
Quick Reference

SelecType Map

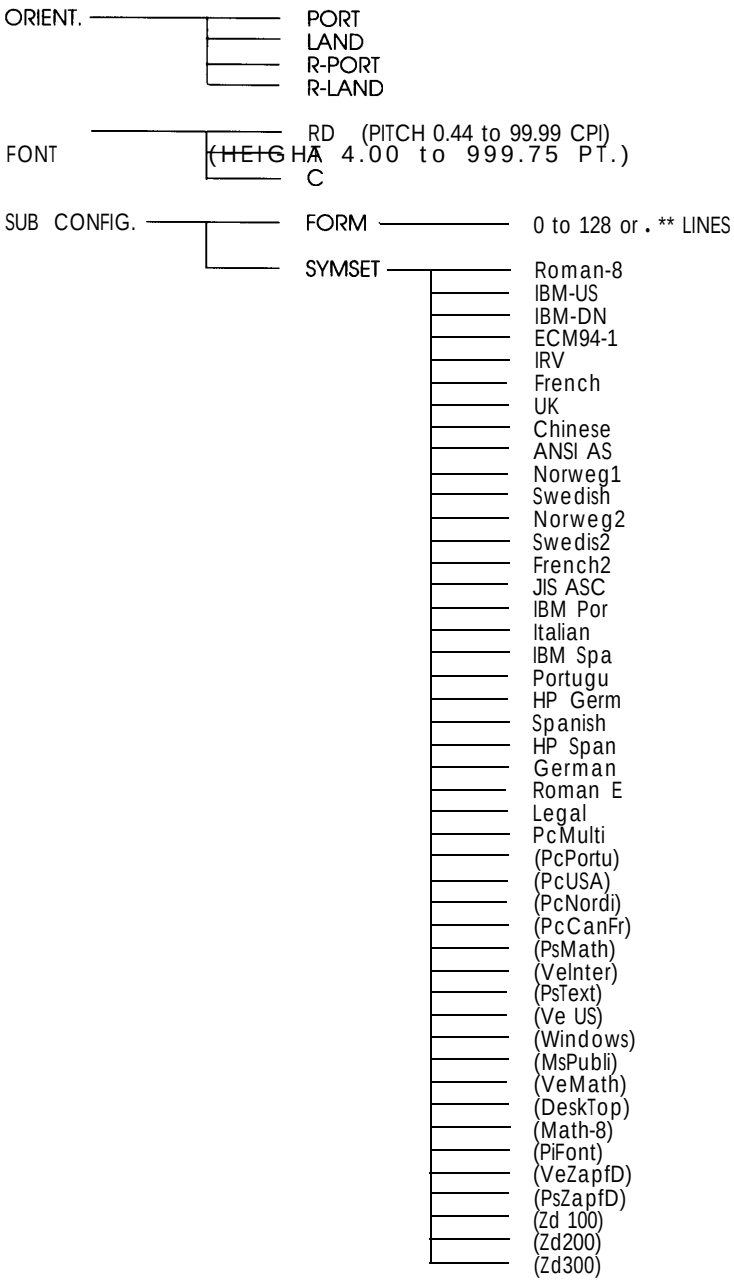
The following menu maps show the possible menus and options in SelecType. Mode-specific options, those marked "refer to mode," are listed under each printer mode later on this card. See Chapter 4 for a description of each option.

Key
( ) - Only available with option
[ ] -Only available with 3/P/Si mode
* - Only available when a font is downloaded
** - Only available on the ActionLaser 1500.

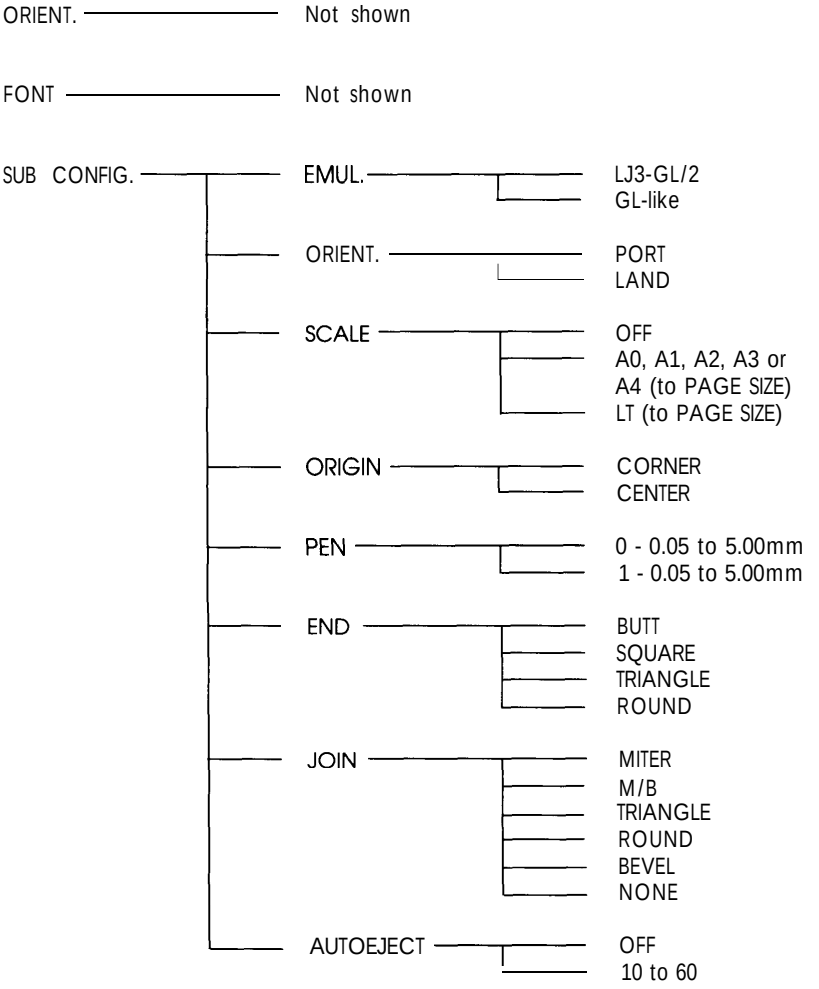
SelecType Level 1



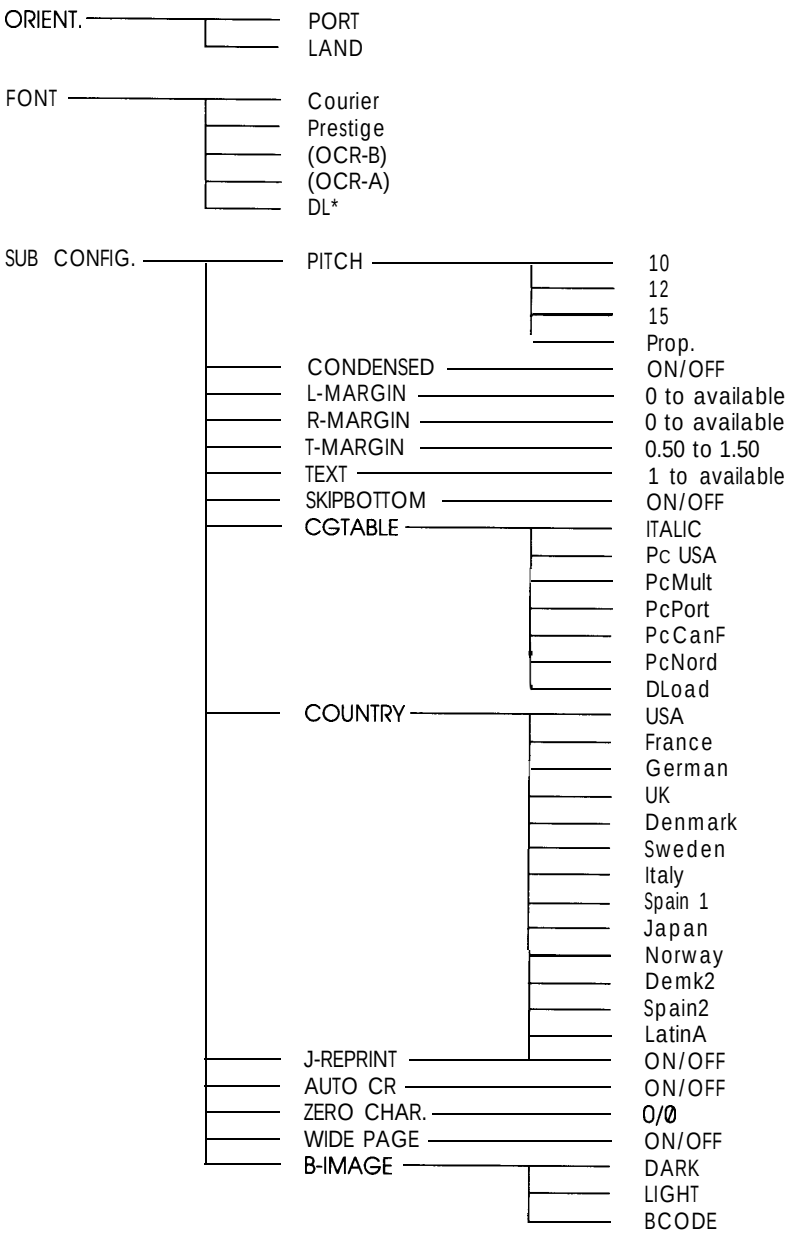
SelecType Level 1 LJ-2P and 3/P/Si modes



SelecType Level 1 in Epson GL/2 mode



SelecType Level 1 in LQ and FX modes



Epson America, Inc.
20770 Madrona Avenue
Torrance, CA 90503

Printed in Japan 93.0: