

EPSON®

9-Pin Dot Matrix Printer

FX-2170

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User's Guide

Printer Update

Please update the information in your User's Guide with the information given below.



On page 1-15, replace the original text with the new information below.

Setting Up Your Software

Refer to the following sections for printer driver installation instructions.

For Microsoft Windows users

If Microsoft Windows is installed on your computer, follow the steps below to install the correct driver for your printer.

If you are using Windows 3.1, follow these steps:

1. **Make sure Windows is running and the Program Manager window is open.**
2. **Insert the floppy disk containing the driver into your floppy disk drive.**
3. **Click File; then click Run.**
4. **Type A: SETUP (or B: SETUP); then click OK.**
5. **Select your printer's name in the Printer Model window and click Continue. The printer driver installs automatically.**
6. **Click OK.**

Installing the driver for Windows 95 users

Follow these steps to install the printer driver using the Windows 95 plug-and play capabilities:

Note:

To install the **driver** using the Windows 95 plug-and play capabilities, your computer's parallel port must be an IEEE-2284 (ECP or EPP compatible) bidirectional parallel port. See **your** computer documentation for more information.

- 1. Make sure plain paper is loaded in the printer and the printer is connected to the computer's parallel port. (The paper is used to perform a test print in step 11.)**
- 2. Turn off your printer and computer, if necessary.**
- 3. Turn on the printer first; then turn on the computer. Your computer begins loading Windows 95.**
- 4. If you defined a password, enter it at the prompt. You see the New Hardware Found screen.**

Note:

If you do not see the New Hardware Found screen, please follow the procedure under "Installing the driver while running Windows 95," the next section.

- 5. Make sure your printer model name is displayed on the screen.** Then **click the** Driver from disk provided by hardware manufacturer **button**. **Do not select any of the other buttons.**

Note:

The next time you turn **on** your computer after installing the driver, Windows 95 may display the New Hardware Found screen again. In this case, click the Do not install a driver radio button; then click **OK**. This screen does not appear again.

6. **Click OK.** You see the **Install From Disk** screen.
7. **Insert the Windows printer driver disk in a disk drive.**
8. **If you inserted the disk in drive A, click OK. Otherwise, change the drive letter in the Copy manufacturer's files from box and click OK.**
9. **At the next screen you can type a unique name for the printer in the Printer name box. We recommend that you keep the model name as shown. The program will copy the files to your hard disk and add an icon to the Printers folder using the printer name you assign.**

To use the printer as the default printer for Windows 95 applications, select Yes. (No is the default setting.)

10. **Click the Next button.**
11. **In the next screen, select YES to print a test page.**
12. **Click the Finish button.**
13. **Choose Yes in the test page confirmation dialog if the page printed correctly. If it did not print correctly, choose No and follow the directions on the screen.**

To access the driver, see "Checking the printer driver settings," page 5 of this supplement.

Installing the driver while running Windows 95

If you are using Windows 95, follow the steps below.

- 1. In the Desktop window, double-click the My Computer icon.**
- 2. Double-click the Printers folder.**
- 3. Double-click the Add Printer icon.**
- 4. Click the Next button.**
- 5. Select the Local printer or Network printer radio button. Then click the Next button.**
- 6. Click the Have Disk button.**
- 7. Insert the floppy disk containing the driver into your computer's floppy disk drive.**
- 8. Type A: WIN 95 (or B: WIN 95); then click OK.**
- 9. Select your printer's name in the dialog box, then click the Next button.**
- 10. Select the port you want to use with this printer.**
- 11. Click the Next button.**
- 12. Select the Yes radio button if you want to make your printer the default printer. Otherwise, select the No radio button.**
- 13. Click the Next button.**
- 14. Click the Yes radio button to print a test page.**
- 15. Click Finish.**
- 16. In the dialog box that appears, choose Yes if the test page printed satisfactorily. If it didn't print satisfactorily, choose No and follow the directions that appear on your screen.**

On page 1-16, add the information below. If you are using Windows 3.1, refer to the information in your User's Guide.

Checking the printer driver settings

If you are using Windows 95, follow these steps to select the appropriate settings.

1. **In the Desktop window, click the Start button.**
2. **Select Settings; then click Printers.**
3. **Right-click on your printer icon.**
4. **Choose Properties.**
5. **Select the paper size you have loaded in the printer from the Paper size list on the Paper menu. If you don't see your paper size, scroll through the list, and select the correct size. The diagram on the screen changes according to the paper size you select.**
6. **Select Portrait or Landscape orientation. The diagram on the screen changes according to the orientation you select.**
7. **Select the paper source.**
8. **Select the resolution on the Graphics menu.**
9. **Make any other settings you wish, and click OK when you are finished.**

On pages 1-18 through 1-20, replace the original information with the new information below.

DOS printer utilities

Your printer driver disk includes the EPSON Remote! and EPSON Calibration utilities. You can use EPSON Remote! to change the printer's default settings from your computer instead of the control panel. EPSON Calibration is used to properly align your printout.

Installing EPSON printer utilities

To install the utilities, follow these steps:

1. **Insert the floppy disk containing the printer utilities into your computer's disk drive.**
2. **From the DOS prompt, type A: SETUP (or B: SETUP); then press Enter.**
3. **In the screen that appears, select your printer's name in the Printer Model window and press Enter. C: EPUTIL appears as the default directory.**
4. **Press Enter. All the necessary files are copied to the EPUTIL directory on drive C.**

Using EPSON printer utilities

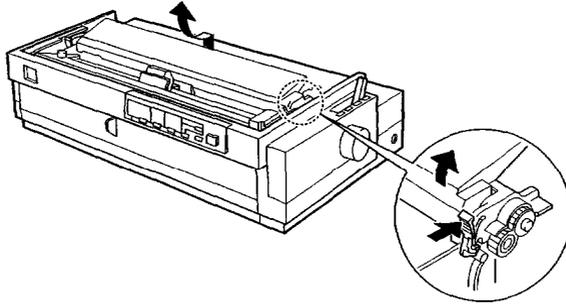
To use your EPSON utilities, follow these steps:

1. **From the DOS prompt, change the current directory to the C drive.**
2. **To use the EPSON Remote! utility, type PRNSET, and press Enter, or to use the EPSON Calibration utility, type CALIBRAT, and press Enter.**
3. **Follow the instructions on the screen to use either utility.**

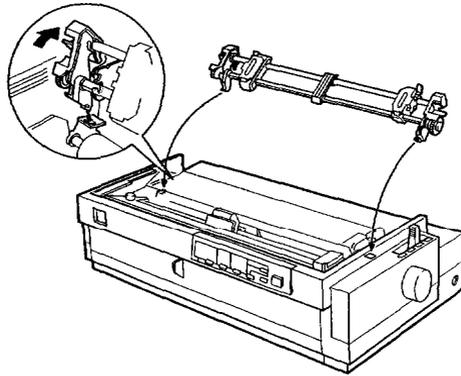
E

On pages 2-11, and 2-12, replace the original illustrations as follows:

1. Please replace the illustration on page 2-11 of your *User's Guide* with the illustration below.



2. Please replace the illustration on the upper portion of page 2-12 of your *User's Guide* with the illustration below.



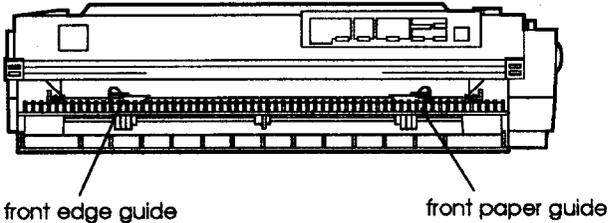
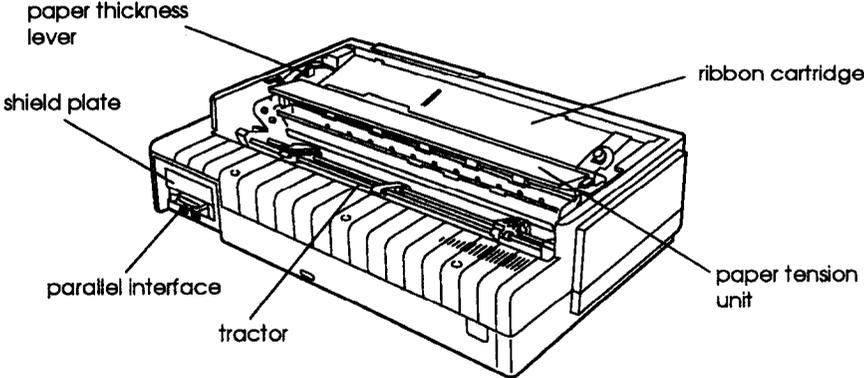
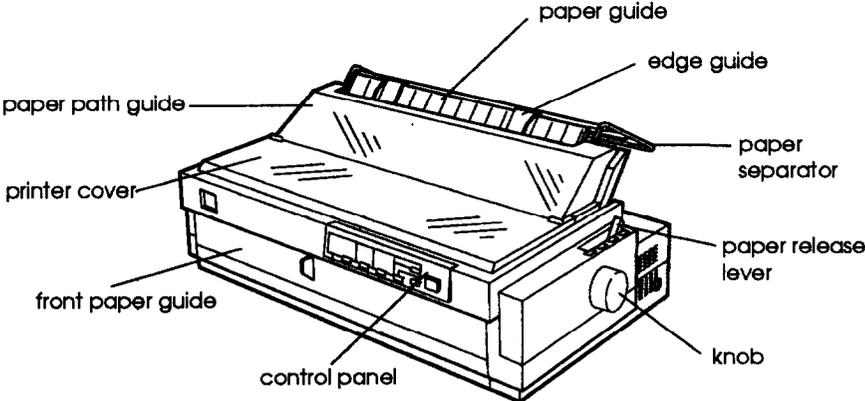
F

On page 5-3, add the information below.

When replacing the ribbon cartridge or ribbon pack, you can use the cartridge and pack listed below, in addition to the products listed in your *User's Guide*.

Ribbon cartridge	S015086
Ribbon pack	S010033

Printer Parts



FCC Compliance Statement
For United States 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 nonshielded 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 the manufacturer could void the user's authority to operate the equipment.

For Canadian Users

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

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

Declaration of Conformity

According to ISO/IEC Guide 22 and EN 45014

Manufacturer: SEIKO EPSON CORPORATION
Address: 3-5, Owa 3-chome, Suwa-shi,
Nagano-ken 392 Japan

Representative: EPSON EUROPE B.V.
Address: Prof. J. H. Bavincklaan 5 1183 AT Amstelveen
The Netherlands

Declares that the Product:

Product Name: Dot Matrix printer
Type Name: FX-2170
Model: P920A

Conforms to the following Directive(s) and Norm(s):

Directive 89/336/EEC:

EN 55022 Class B
EN 50082-1
IEC 801-2
IEC 801-3
IEC 801-4

Directive 73/23/EEC:

EN 60950

Directive 90/384/EEC:

EN 45501

August 1995

M. Hamamoto
President of EPSON EUROPE B.V.

Where to Get Help for United States Users

EPSON provides customer support and service through a nationwide network of Authorized EPSON Customer Care Centers.

EPSON also provides the following support services in the U.S. and Canada through the EPSON ConnectionSM at (800) 922-8911:

- Technical assistance with the installation, configuration, and operation of EPSON products
- Assistance in locating your nearest Authorized EPSON Reseller or Customer Care Center
- Customer Relations
- EPSON technical information library fax service
- Product literature on current and new products

You can purchase ribbons, supplies, parts, documentation, and accessories for your EPSON products from EPSON Accessories at (800) 873-7766 (U.S. sales only). In Canada, call (800) BUY-EPSON for sales locations.

CompuServe® online support

If you have a modem, the fastest way to access helpful tips, specifications, drivers, application notes, and bulletins is through the Epson America Forum on CompuServe.

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

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

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

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

For United Kingdom Users

Use of options

Epson (UK) Limited shall not be liable against any damages or problems arising from the use of any options or consumable products other than those designated as Original Epson products or Epson Approved Products by Epson (UK) Limited.

Safety information

warning:

This appliance must be earthed. Refer to rating plate for voltage and check that the appliance voltage corresponds to the supply voltage.

Important:

The wires in the mains lead fitted to this appliance are coloured in accordance with the following code:

Green and yellow - Earth

Blue -Neutral

Brown - Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The green and yellow wire must be connected to the terminal in the plug which is marked with the letter E or with the earth symbol (G) or coloured green or green and yellow.**
- The blue wire must be connected to the terminal in the plug marked with the letter N or coloured black.**
- The brown wire must be connected to the terminal in the plug marked with the letter L or coloured red.**

If damage occurs to the plug, replace the cord set or consult a qualified electrician.

Replace fuses only with a fuse of the correct size and rating.

Important Safety Instructions

Before using your printer, read the following safety instructions to make sure you use the printer safely and effectively.

- ❑ Turn off and unplug the printer before cleaning. Clean with a damp cloth only. Do not spill liquid on the printer.
- ❑ Do not place the printer on an unstable surface or near a radiator or heat register.
- ❑ Do not block or cover the openings in the printer's cabinet. Do not insert objects through the slots.
- ❑ Use only the type of power source indicated on the printer's label.
- ❑ Connect all equipment to properly grounded power outlets. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.
- ❑ Do not let the power cord become damaged or frayed.
- ❑ If you use an extension cord with the printer, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure the total of all devices plugged into the wall outlet does not exceed 15 amperes.
- ❑ Except as specifically explained in this guide, do not attempt to service the printer yourself.
- ❑ Unplug the printer and refer servicing to qualified service personnel under the following conditions:

If the power cord or plug is damaged; if liquid has entered the printer; if the printer has been dropped or the cabinet damaged; if the printer does not operate normally or exhibits a distinct change in performance. Adjust only those controls that are covered by the operating instructions.

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Choosing a Place for the Printer

When selecting a place to set up your printer, be sure to follow these guidelines:

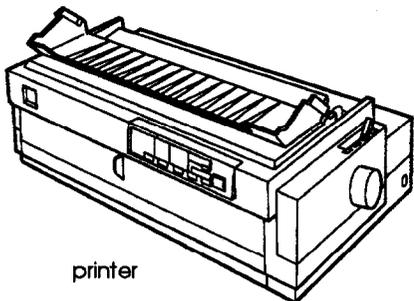
- ❑ Place the printer on a flat, stable surface, close enough to the computer for the interface cable to reach it.
- ❑ Leave adequate room around the printer for easy operation and maintenance.
- ❑ Avoid locations that are subject to direct sunlight, excessive heat, moisture, or dust.
- ❑ Use a properly grounded electrical outlet; do not use an adapter plug.
- ❑ Place the printer where you can easily unplug the power cord.
- ❑ Avoid electrical outlets controlled by wall switches or automatic timers. Accidental disruption of power can erase information in the memory of your printer or computer.
- ❑ Avoid outlets on the same circuit as large motors or other appliances that can cause voltage fluctuations.
- ❑ Keep the entire computer system away from potential sources of electromagnetic interference, such as loudspeakers or the base units of cordless telephones.

If you plan to use a printer stand, follow these guidelines:

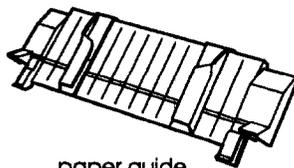
- ❑ Use a stand that supports at least 26 kg (57.8 lbs).**
- ❑ Never use a stand that tilts the printer at an angle of more than 15 degrees from horizontal. If you install a cut-sheet feeder, the stand must keep your printer level.**
- ❑ If you plan to load continuous paper through the bottom of the printer, choose a stand that provides an unobstructed paper path.**
- ❑ Position your printer's power cord and interface cable so they do not interfere with paper feeding. If possible, secure the cables to a leg of the printer stand.**
- ❑ Align the paper stack so that the paper feeds straight into the tractor's sprocket units.**

Unpacking the Printer

Your printer box should include an EPSON printer driver disk and the following items:



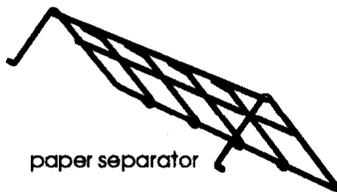
printer



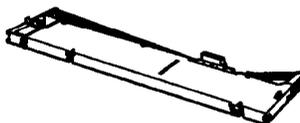
paper guide



power cord
(230 V version only)



paper separator



ribbon cartridge

Note:

In some locations the power cord may be permanently attached to the printer.

Keep the packing materials in case you need to transport your printer.



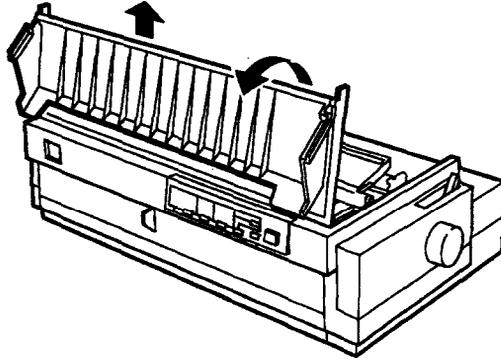
Caution:

There are several versions of the printer designed for different voltages, and it is not possible to adjust the printer for use at another voltage. If the label on the back of the printer does not show the correct voltage for your country, contact your dealer.

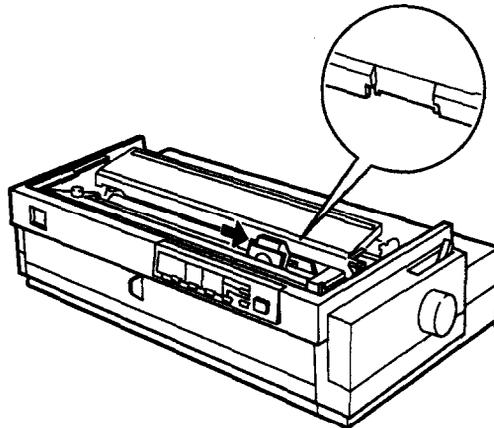
Installing the Ribbon Cartridge

Before installing the ribbon cartridge, make sure that the power cord is not plugged into an electrical outlet.

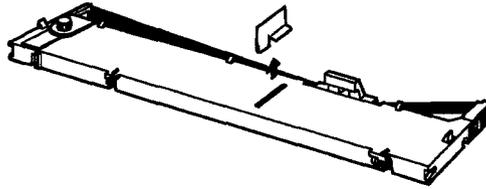
1. Lift the printer cover up and off.



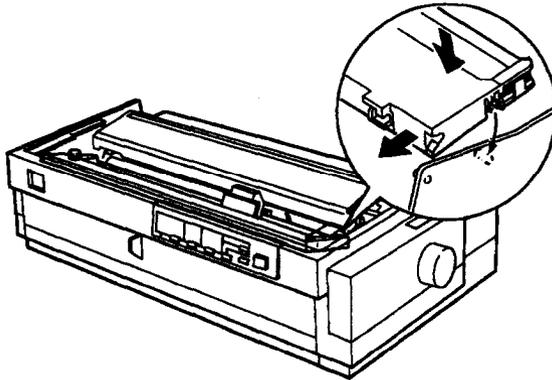
2. Slide the print head to the ribbon installation position (the indented portion of the paper tension unit.)



3. Remove the plastic separator from the middle of the ribbon cartridge and discard the separator.

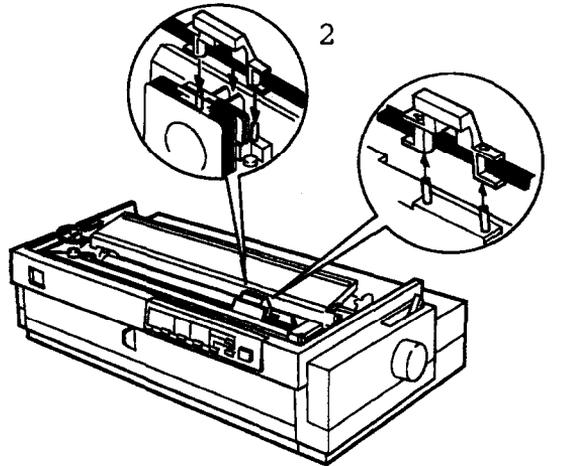


4. Hold the cartridge with the ribbon-tightening knob facing you. Place the bottom edge of the cartridge into the printer so that the notch on each end of the cartridge fits over the small peg on each side of the printer.

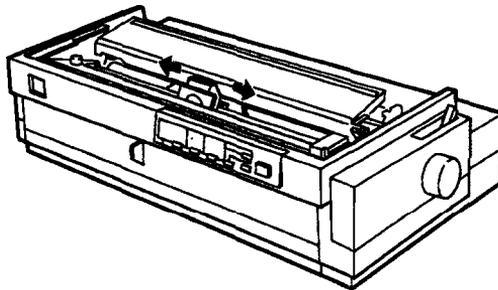


5. Lay the cartridge flat and press gently until it clicks into place on both ends.

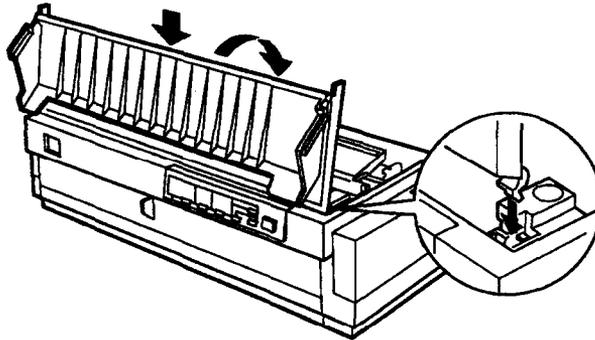
6. Lift the ribbon guide and insert it firmly over the metal pins behind the print head. Press down on the guide until it clicks into place. Make *sure the ribbon is not twisted or creased* and that it is in place behind the print head. Turn the ribbon-tightening knob to remove any slack in the ribbon.



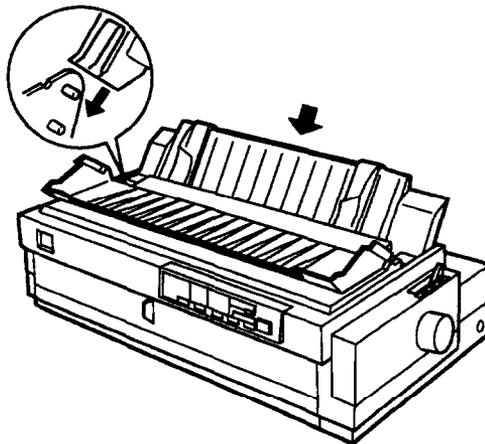
7. Slide the print head from side to side to make sure it moves smoothly.



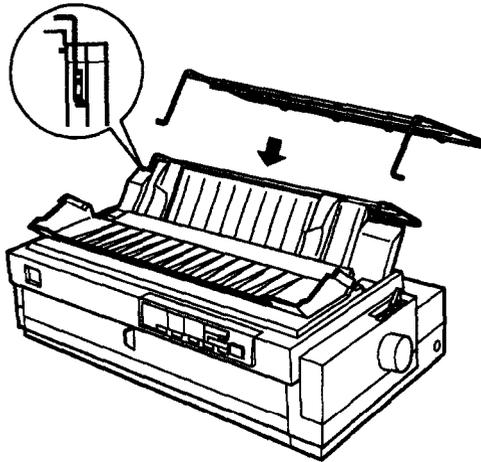
8. Replace the printer cover by first inserting the front tabs into the slots near the front of the printer; then lower it into place.



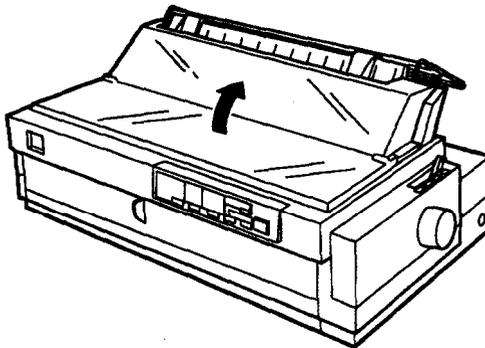
9. Attach the paper guide by sliding the slots on the bottom of the paper guide over the pegs behind the paper tension unit.



10. Insert the paper separator into the paper guide.



11. Lift the paper path guide and rest it against the paper guide.



Note:

Always close the printer cover before printing. The printer stops printing when the cover is open.

Plugging in the Printer

1. **Make sure the printer is turned off.**
2. **Check the label on the back of the printer to make sure the voltage matches that of your electrical outlet.**



Caution:

If the rated voltage and your outlet voltage do not match, contact your dealer assistance. Do not plug in the power cord.

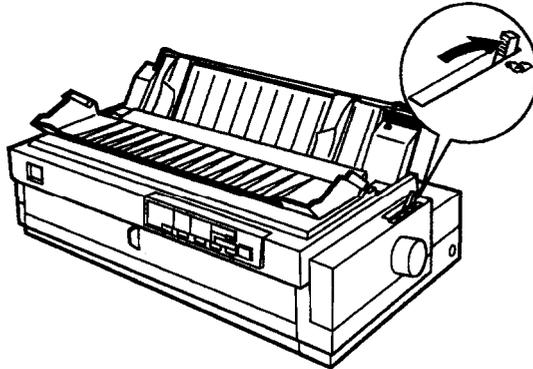
3. **If the power cord is not attached to the printer, connect the appropriate end to the AC inlet on the printer's rear panel.**
4. **Plug the power cord into a properly grounded electrical outlet.**

Running the Self Test

You can run a self test on the printer in near letter quality or draft mode, with either continuous paper or single sheets. You can load the paper from the rear, front, top, or bottom. The following steps describe how to run the test on single-sheet paper, loaded from the top. See Chapter 2 for more information on paper handling.

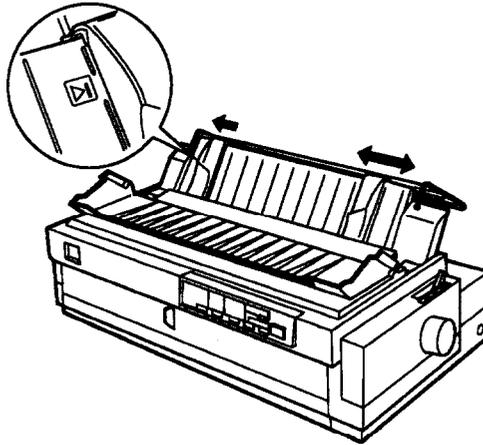
The printer prints the self test in the currently selected font.

1. Make sure the printer is turned off and the paper path guide is open.
2. Move the paper release lever to the single-sheet position.



3. For the near letter quality test, hold down the Load/Eject button while you turn on the printer. For draft printing, hold down the LF/FF button while you turn on the printer.

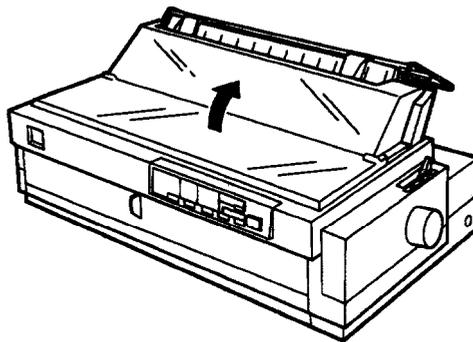
4. Move the left edge guide until it locks in place next to the arrow guide mark. Then adjust the right edge guide to match the width of your paper.



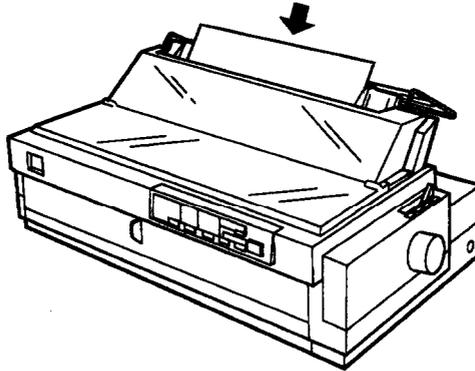
Caution:

Run the self test using paper at least 360 mm (14 inches) wide; otherwise, the print head prints directly on the platen.

5. Lift the paper path guide and rest it against the paper guide.



6. Insert a sheet of paper between the edge guides until it meets resistance. Make sure you adjust the edge guides to match the width of your paper. After a few seconds, the printer feeds the paper to the loading position and begins printing the self test.



Note:

Always close the printer cover before printing. The printer stops printing when the cover is open.

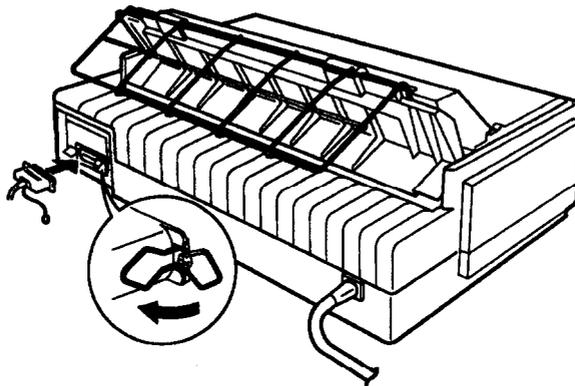
7. To stop the self test temporarily, press the Pause button.
8. To end the self test, press the Pause button, then turn off the printer. Here is part of a typical self test:

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`a.
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`ab
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcd
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdef
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefg
Roman T
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz(!- !
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz(!- !
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz(!- !#
```

Connecting the Printer to Your Computer

If the self test printed correctly, you are ready to connect your printer to the computer. Use a 36-pin cable to connect your computer to your printer's built-in parallel interface. Follow these steps:

1. Make sure both the printer and computer are turned off; then plug the cable connector securely into the printer's parallel interface connector. Squeeze the wire clips together until they lock in place on either side of the connector.



Note:

If your cable has a ground wire, connect it to the ground connector beneath the interface connector.

2. Plug the other end of the cable into the computer. (If there is a ground wire at the computer end of the cable, attach it to the ground connector at the back of the computer.)

Setting Up Your Software

Most software lets you specify the type of printer you use so that you can take full advantage of the printer's features. Your software probably provides an installation or setup section that presents a list of printers.

Microsoft Windows and all Windows programs

If Microsoft® Windows™ is installed on your computer system, follow the steps below to install the correct driver for your printer. Your printer will work correctly for all your Windows programs, such as Word for Windows, Lotus® 1-2-3® for Windows, and CorelDRAW!®.

If Windows is not already installed on your system, run the Windows setup program as described in the documentation that comes with the program. Then follow the steps below to install the correct printer driver.

- 1. Make sure Windows is running and that the Main window is open.**
- 2. Insert the EPSON driver disk into your computer's diskette drive slot.**
- 3. From the File menu choose Run.**
- 4. Type A:\DRIVER\SETUP, and choose OK. (This assumes that drive A is the diskette drive.)**
- 5. Select FX-2170 as the Printer Model and click Continue. The printer driver installs automatically.**
- 6. Click OK.**

Checking the printer driver settings

before you start printing, you should make sure that the driver settings match your document requirements. While many Windows applications override the printer settings made with the driver, some do not. because of this, you must choose the correct settings to get the results you expect.

Be sure to check the following:

- | | |
|--|--|
| <input type="checkbox"/> Resolution | The printing resolution in dots per inch (dpi). |
| <input type="checkbox"/> Paper size | The size of the paper loaded in the printer. |
| <input type="checkbox"/> Orientation | The direction of printing on the page (portrait or landscape). |
| <input type="checkbox"/> Paper source | Tractor, manual feed, or sheet feeder. |

Follow these steps to select the appropriate settings:

1. In the Main window, double-click the control Panel icon.
2. Double-click the Printers icon. Make sure your printer is highlighted.
3. Click the Setup button in the Print Setup menu.
4. Select the paper size you have loaded in the printer from the Paper Size list. If you don't see your paper size in the list, use the arrows on the right to scroll through the list. The diagram on the screen changes according to the paper size you select.
5. Select Portrait or Landscape orientation. The diagram on the screen changes according to the orientation you select.
6. Select the resolution you desire.
7. Select the paper source.

8. Click Options to open the option menu.

You can control intensity by clicking the arrow to darker or lighter; you can control dithering by choosing None, Coarse, or Fine.

Using non- Windows software

Most DOS software programs include drivers for ESC/P printers. Also, DOS programs require you to select from a list of printers to install the printer driver. If your printer is not included in the list, contact your software manufacturer to see if there is an update.

If your printer driver is not available, select the first printer driver available in the list below.

FX-870/1170

FX-850/1050

FX-800/1000

EX-800/1000

FX-85/105

FX-80+/100+

FX-80/100

See the program's documentation for instructions on selecting the driver.

Printer utilities

The following DOS utilities are included with the printer:

- ❑ **Epson Remote! utility allows you to change the printer's default settings from your computer.**
- ❑ **Epson Calibration utility lets you adjust the printing alignment from your computer. Use this utility when the lines in your printout do not appear to be aligned properly.**

Installing Epson Remote!

Follow these steps to install Epson Remote! on your hard disk drive:

- 1. Insert the diskette containing the EPSON Remote! utility into your computer's diskette drive.**
- 2. In DOS, access the drive where you have loaded the diskette.**
- 3. Change the directory to UTILITY (that is, type A:\UTILITY if the diskette is in drive A).**
- 4. Type INSTALL (space) [drive name] (space) [directory name]**

For example, type INSTALL C: EPREMOTE, and press Enter.

Note:

Do not type a backslash (\) between the parameters. Use the space bar.

The installation is completed automatically.

Using Epson Remote!

To make changes to the default settings with Epson Remote!, follow these steps:

1. **Change to the directory you specified, for example:**
C:\EPREMOTE\.
2. **Type PANEL (C:\EPREMOTE\PANEL), and press Enter.**

You'll see the printer settings that can be changed while the printer is on, for example, the bin selection and print direction.

3. **Change the desired settings.**
4. **Press F1 to save the settings. (The settings are then sent to the printer.)**
5. **Press F2 to leave the menu.**
6. **Type PRNSET (C:\EPREMOTE\PRNSET), and press Enter.**

You'll see the printer's default settings, which are described in "Changing the Default Settings" in Chapter 3.

7. **Change the desired settings.**
8. **Press F1 to save your settings and F2 to leave the menu.**

Using Epson Calibration

To run the CALIBRAT.EXE utility program, follow these steps:

1. **Insert the diskette containing the calibration utility into your computer's diskette drive.**
2. **In DOS, access the drive where you have loaded the diskette.**
3. **Change the current directory to UTILITY (that is, type A:\UTILITY if the diskette is in drive A).**
4. **Type CALIBRAT, and press Enter.**
5. **Follow the instructions on the screen to calibrate your printer.**

Note:

You can also copy the program from the diskette to your hard disk. Then change the current directory (or set the path to the directory), type CALIBRAT, and press Enter.

Chapter 2

Paper Handling

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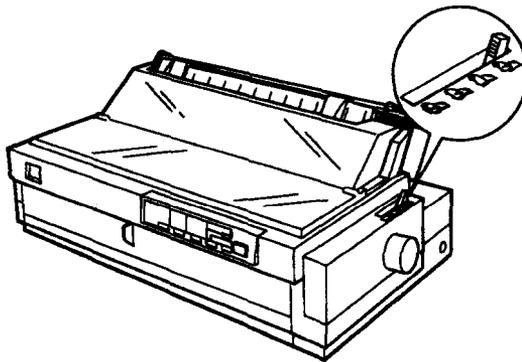
Selecting the Paper Feeding Method

The printer can accommodate almost any type of paper with front, rear, and bottom paper slots plus a tractor that can be mounted in two different positions—front and top.

This chapter explains the various methods of paper handling and includes recommendations on the feeding methods best suited to your specific needs.

Setting the paper release lever

First you need to set the paper release lever for the type of paper and feeding method you want to use. The paper release lever has four positions, with icons indicating the type of paper and paper path for each position.



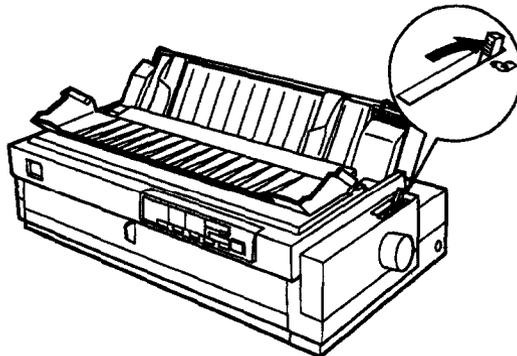
	<p>Single-sheet position-for all single sheets (including envelopes and postcards), whether loaded from front, top, the optional cut-sheet feeders, or the roll paper holder.</p>
	<p>Front push and front push/pull tractor position-for continuous paper when the tractor unit is installed in the front.</p>
	<p>Rear push and rear push/pull tractor position-for continuous paper when the tractor unit is installed in the rear.</p>
	<p>Pull tractor position-for continuous paper when the tractor unit is installed on the top. In this case, you can load paper from the front, rear, or bottom.</p>

Using Single Sheets

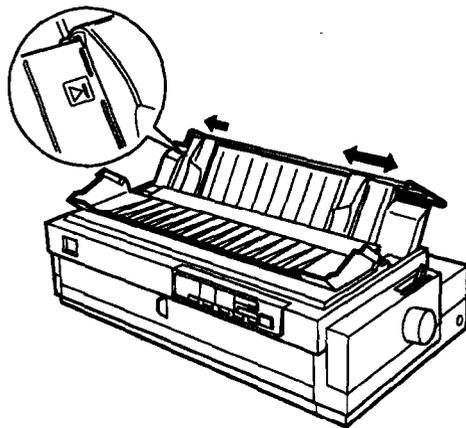
You can print on single sheets of paper from 101 to 420 mm (4.0 to 16.5 inches) wide. You can load single sheets from either the top or front of the printer.

Loading single sheets from the top

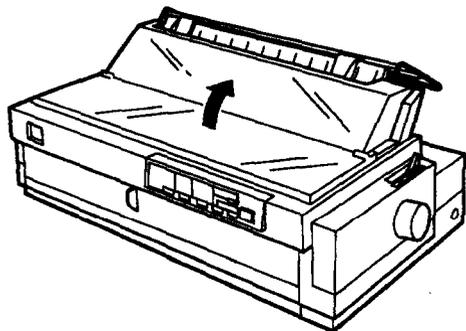
1. **Move the paper release lever to the single-sheet position. Make sure the paper guide is installed and the paper path guide is open.**



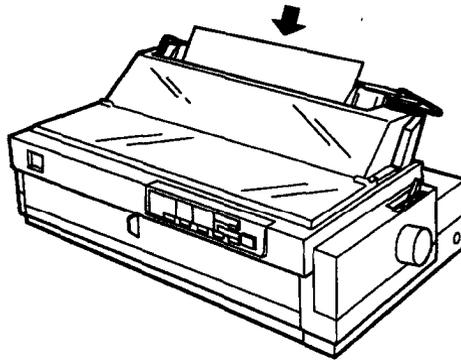
2. Turn on the printer. Slide the left edge guide until it stops next to the arrow on the paper guide. Then adjust the right edge guide to match the width of your paper.



3. Lift the paper path guide and rest it against the paper guide.



4. **Insert the paper firmly between the edge guides until it meets resistance. After a few seconds, the printer advances the paper to the loading position. You are now ready to print.**



Note:

Always close the printer cover before printing. The printer stops printing when the cover is open.



Caution:

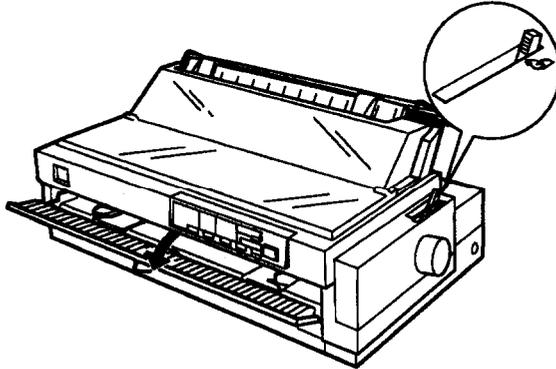
Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage the printer or cause it to lose the top-of-form position.

If the platen turns but the printer doesn't load the paper, completely remove the paper and re-insert it more firmly.

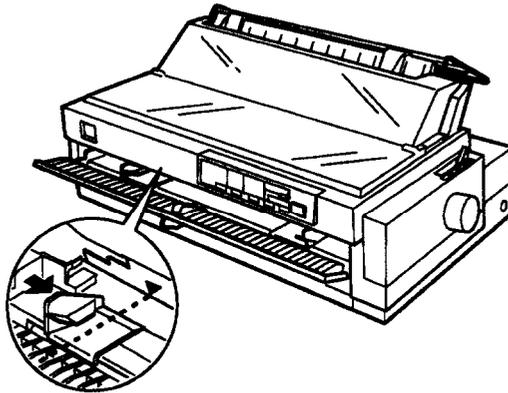
To eject the paper, press the Load/Eject button.

Loading single sheets from the front

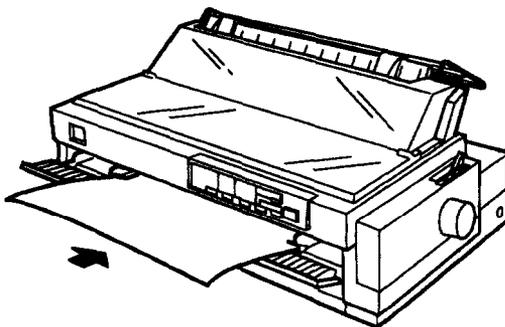
1. Move the paper release lever to the single-sheet position and open the cover. Make sure the paper path guide rests against the paper guide.



2. Turn on the printer.
3. Position the left edge guide as shown below. (Printing starts at the arrow mark.) See the Appendix for more information on the left margin position.



4. While aligning the paper's left and right edges with the edge guides, insert the paper firmly until it meets resistance. After a few seconds, the printer loads the paper to the loading position. You are now ready to print.



Note:

Always close the printer cover before printing. The printer stops printing when the cover is open.



Caution:

Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage the printer or cause it to lose the top-of-form position.

If the platen turns but the printer doesn't load the paper, completely remove the paper and re-insert it more firmly.

To eject the paper, press the Load/Eject button.

Using Continuous Paper

The printer's paper-handling system allows you to load continuous paper through the front, rear, or bottom.

You can print on continuous paper from 101 to 406 mm (4 to 16 inches) wide.

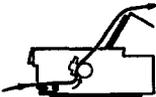
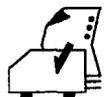
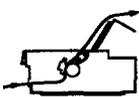
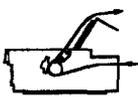
To print on continuous paper, you need to install the tractor unit in the front or pull position. Be sure you set the paper release lever correctly.

Note:

The rear push tractor cannot be removed.

Selecting the tractor position and paper path

The table below lists the different ways to feed continuous paper. Always set the paper release lever to the position indicated for the paper feed method you are using.

Tractor position	Paper release lever position	Paper paths
Front push tractor and front push/pull		 
Rear push tractor and rear push/pull		 
Pull tractor		  

Make sure you align your paper supply with the paper loaded in the tractor so the paper feeds smoothly into the printer.

If you feed paper through the bottom paper slot, use a printer stand that has a large enough opening for paper to feed from the bottom without obstruction.

Changing tractor positions

You can use the removable tractor unit as either a front push tractor or a pull tractor; you just change the tractor position according to your paper feeding method.

Note:

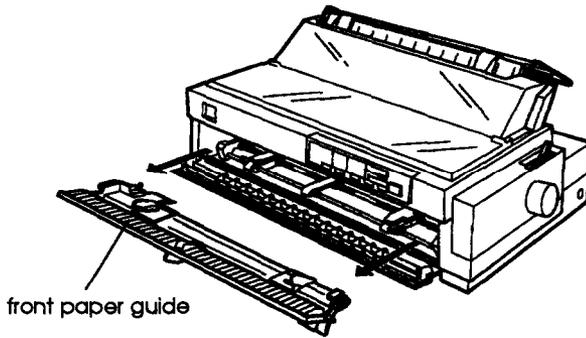
The rear push tractor cannot be removed.

Using the front push tractor position

Before installing the tractor in the front position, you need to remove it from its current position (top) by pressing the tractor's lock tabs while you lift it off the printer.

- 1. Make sure the printer is turned off.**

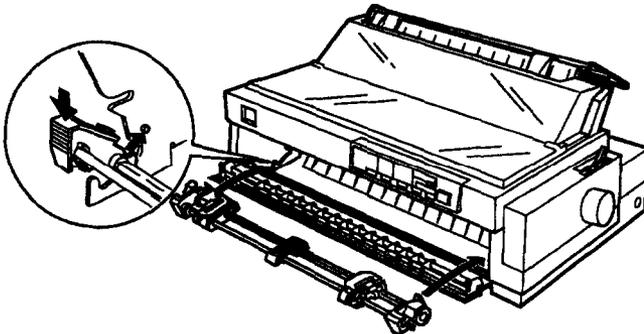
2. **Open the front paper guide and remove it by grasping the fins on both sides and pulling it straight out of the printer.**



Note:

When loading multipart forms that are bound on only one side by line gluing, always use the rear push tractor. This type of form cannot be fed from the front push tractor.

3. **Push the tractor into the printer's mounting slot as shown below. You are now ready to load continuous paper with the front push tractor.**

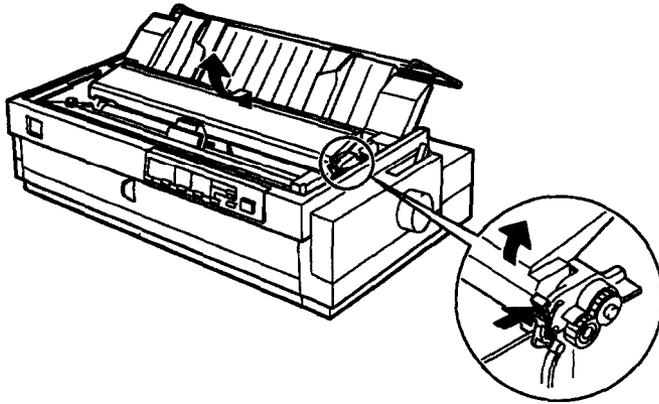


To remove the tractor unit, press its lock tabs, tilt it forward, and lift it out of the printer.

Using the pull tractor position

Before installing the tractor in the top position, you need to remove it from its current position (front) by pressing the tractor's lock tabs while you lift it off the printer.

- 1. Make sure the printer is turned off.**
- 2. Lift the printer cover and paper guide up and off the printer.**
- 3. Grasp both ends of the clear plastic paper-tension unit, raise the front of the unit, and lift it off the printer.**



Note:

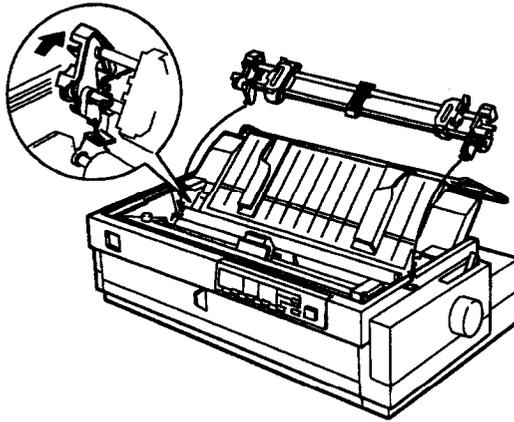
Check the paper thickness lever position to ensure that it wasn't moved during pull tractor installation. See "Adjusting the paper thickness lever" later in this chapter for the correct lever position.



Warning:

Never move the print head while the printer is turned on; this can damage the printer. Also, if you just used the printer, the print head may be hot. Let it cool for a few minutes before touching it.

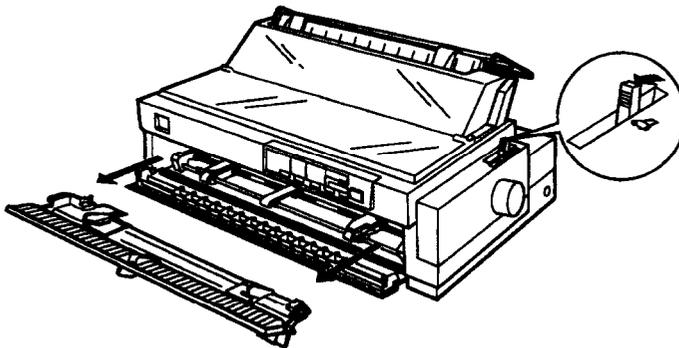
4. Push the tractor into the printer's mounting slot as shown below.



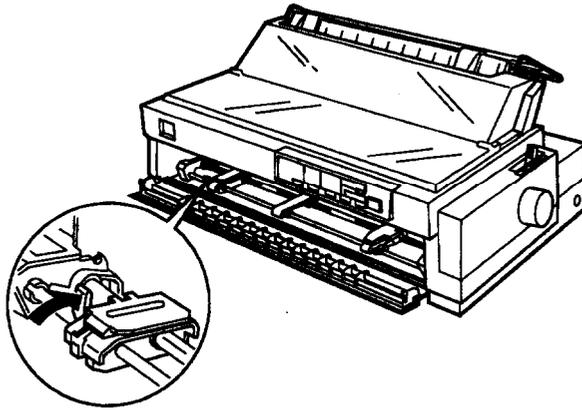
To remove the tractor unit, hold down its lock tabs, tilt it back, and lift it off the printer.

Loading the front push tractor

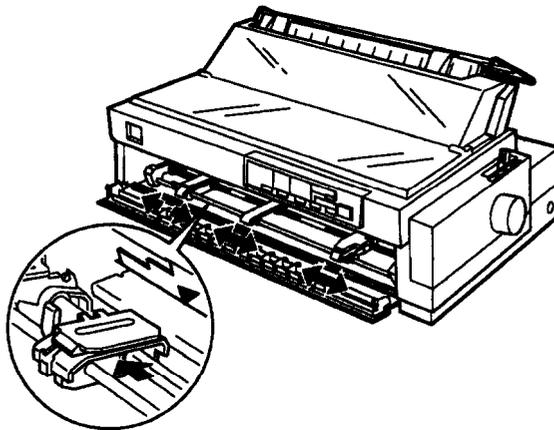
1. Make sure the printer is turned off.
2. Remove the front paper guide as shown below. Make sure the tractor is in the front mounting slot and the paper release lever is set to the front push tractor position.



3. Release the sprockets by pushing the sprocket locks backward.

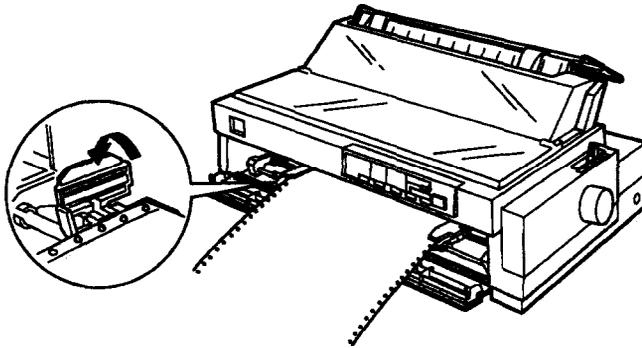


4. Position the left sprocket as shown below. (Printing starts at the arrow mark.) See the Appendix for more information on the left margin position.

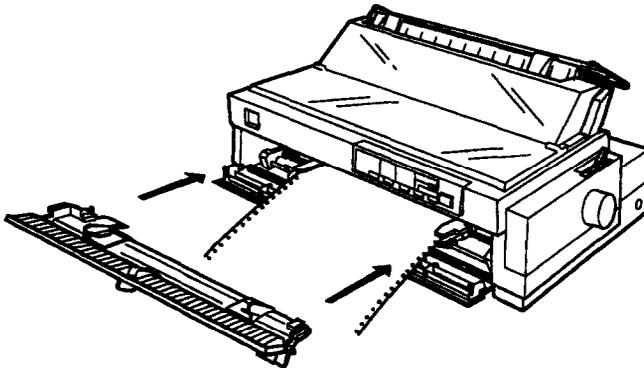


5. Lock the sprocket in place. Then slide the right sprocket to match the width of your paper, but do not lock it.

6. Make sure your paper has a clean, straight edge. Then open the sprocket covers and fit the holes of the paper over the tractor pins.



7. Close the sprocket covers.
8. Slide the right sprocket to remove any slack in the paper; then lock it in place.
9. Attach the front paper guide.



10. Slide the left and right edge guides to the center of the paper guide.

11. Turn on the printer. When the printer receives data, it automatically loads the paper before printing.

Note:

- ❑ Always close the printer cover before printing. The printer stops printing when the cover is open.
- ❑ You can also advance the paper to the loading position by pressing the Load/Eject button.
- ❑ Advance the paper behind the printer guide as shown below. Make sure the paper path guide rests against the paper guide.



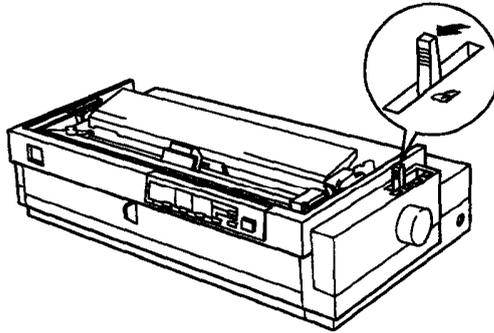
Caution:

Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage **the printer or cause** it to lose the tap-of-form position.

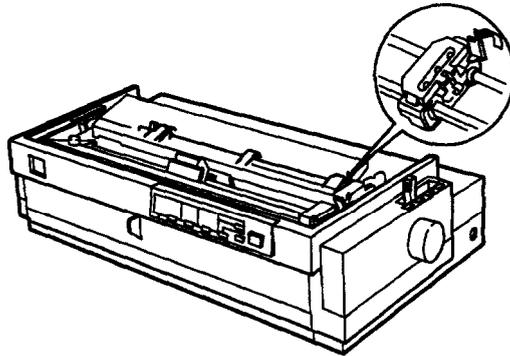
Loading the rear push tractor

1. Make sure the printer is turned off.
2. Remove the printer cover and paper guide.

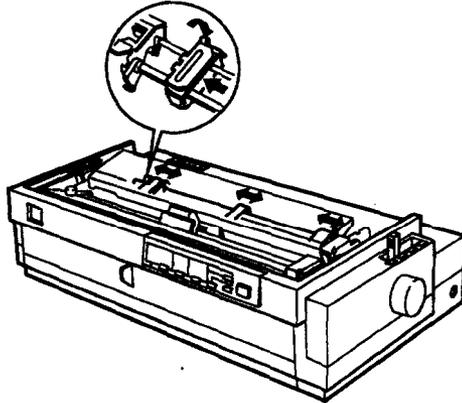
3. Make sure the paper release lever is set to the rear push tractor position.



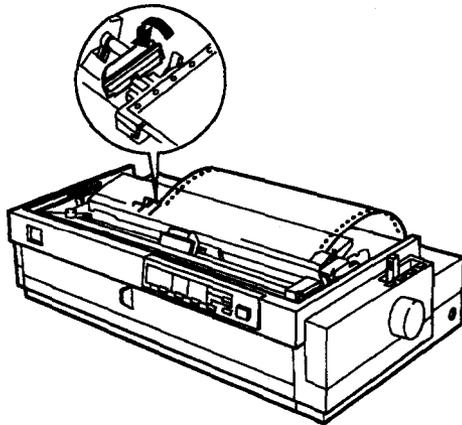
4. Release the sprockets by pushing the sprocket locks forward.



5. Slide the left sprocket to the left margin of the paper using the scale on the printer as shown below. (Printing starts at the “0” mark. See the Appendix for more information on the left margin position.) Then slide the right sprocket to match the width of your paper, but do not lock it.



6. Make sure your paper has a clean, straight edge. Then open the sprocket covers and fit the holes of the paper over the tractor pins.

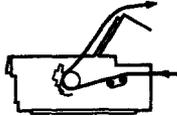


7. Close the sprocket covers.

8. **Slide the right sprocket to remove any slack in the paper, then lock it in place.**
9. **Attach the printer cover and paper guide.**

Note:

Advance the paper behind the printer guide as shown below. Make sure the paper path guide rests against the paper guide.



10. **Slide the left and right edge guides to the center of the paper guide.**
11. **Turn on the printer. When the printer receives data, it automatically loads the paper before printing.**

Note:

- Always close the printer cover before printing. The printer stops printing when the cover is open.*
- You can also advance the paper to the loading position by pressing the Load/Eject button.*

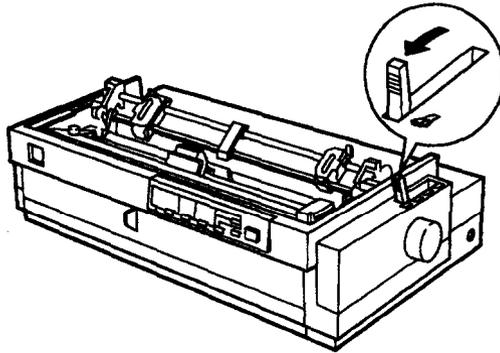


Caution:

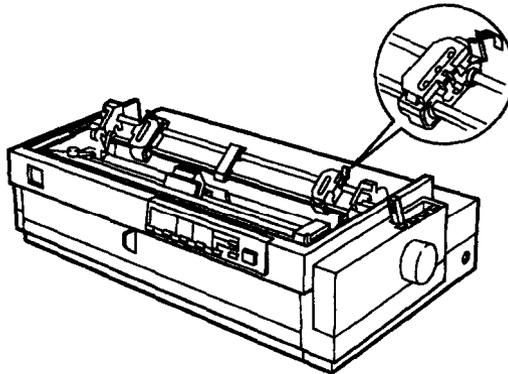
Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage the printer or cause it to lose the top-of-form position.

Loading the pull tractor

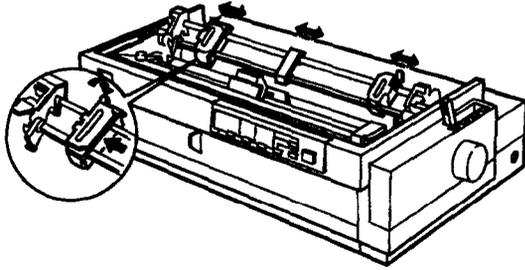
1. **Make sure the printer is turned off.**
2. **Remove the printer cover and paper guide.**
3. **Make sure the tractor is in the pull tractor position and the paper release lever is set to the pull tractor position.**



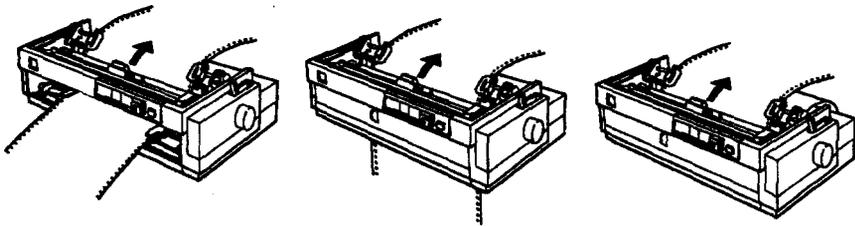
4. **Release the sprockets by pushing the sprocket locks forward.**



5. Slide the left sprocket to the left margin of the paper using the scale at the rear of the tractor as a guide. (Printing starts at the "0" mark. See the Appendix for more information on the left margin position.) Then slide the right sprocket to match the width of your paper, but do not lock it.



6. Make sure your paper has a clean, straight edge. Open the sprocket covers and insert paper from either the top, rear, or bottom paper slot. Then fit the holes of the paper over the tractor pins.

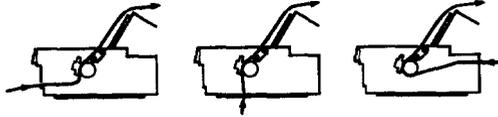


7. Close the sprocket covers.
8. Slide the right sprocket to remove any slack in the paper; then lock it in place.

9. Attach the printer cover and paper guide.

Note:

Advance the paper behind the printer guide as shown below. Make sure the paper path guide rests against the paper guide.



10. Slide the left and right edge guides to the center of the paper guide.

11. Turn on the printer. When the printer receives data, it automatically loads the paper before printing.

Note:

- Always close the printer cover before printing. The printer stops printing when the cover is open.*
- You can also advance the paper to the loading position by pressing the Load/Eject button.*



Caution:

Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage the printer or cause it to lose the top-of-form position.

Loading the push/pull tractor

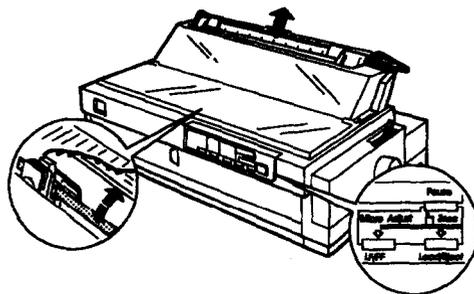
To use the push and pull tractors in combination, you must first purchase the optional pull tractor. See Chapter 4 for more information on printer options.

Note:

The standard rear push tractor cannot be removed.

To load paper in the tractor, follow these steps:

1. Make sure the tractor is in the push/pull tractor position and the paper release lever is set to either the front push or rear push tractor position.
2. Load paper in the front or rear push tractor as described in the previous sections.
3. Push the LF/FF button to advance the paper to the next page.
4. Fit the paper to the pull tractor's sprocket as described in the previous section.
5. Move the paper release lever to the pull tractor position, and use micro adjust (described in the next chapter) to remove any slack in the paper.



6. Move the paper release lever back to the push tractor position.
7. Attach the paper guide and printer cover.

8. Slide the left and right edge guides to the center of the paper guide.
9. Raise the paper path guide and rest it against the paper guide.

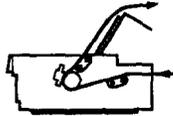
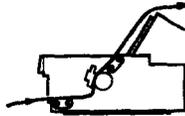


Caution:

Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage the printer or cause it to lose the top-of-form position.

Note:

- ❑ Always close the printer cover before printing. The printer stops printing when the cover is open.
- ❑ Advance the paper behind the printer guide as shown below. Make sure the paper path guide rests against the paper guide.



Removing paper from the tractor

1. To remove continuous paper, press the Tear Off/Bin button to feed the paper's perforation to the tear-off edge of the printer cover.

Note:

If the page perforation is not properly aligned with the tear-off edge, you can adjust the tear-off position using micro adjust. See Chapter 3.

2. Tear off the paper.
3. Press the Load/Eject button to feed the continuous paper backward out of the printer and into the standby position.

**Caution:**

*Make sure you tear off your printed document before **pressing** the Load/Eject button. Reverse feeding several pages at a time may cause a paper jam.*

Switching Between Continuous Paper and Single Sheets

When using the push tractor in the front or rear position, you can easily switch between continuous and single-sheet printing without removing the paper.

Switching to single sheets

To switch from continuous paper to single sheets, follow these steps:

- 1. If any printed sheets remain in the printer, press the Tear Off /Bin button to advance the paper to the tear-off position.**
- 2. Tear off the printed pages.**

**Caution:**

- Always tear off paper before back-feeding paper through the printer; back-feeding too many sheets can cause a paper jam.*
 - Never back-feed labels. Labels can easily come off their backing and jam the printer.*
- 3. Press the Load/Eject button. The printer feeds the continuous paper backward to the standby position. The paper is still attached to the push tractor but is no longer in the paper path.**
 - 4. Move the paper release lever to the single-sheet position.**
 - 5. Adjust the edge guides to match the width of your paper.**

You can now load single sheets as described in “Using Single Sheets,” earlier in this chapter.

Switching to continuous paper

To switch from single sheets back to continuous paper, follow these steps:

1. If a single sheet is in the paper path, press the Load/Eject button to eject it.
2. Move the paper release lever to the push or pull tractor position.

The printer advances the continuous paper to the loading position when it receives data.

Printing on Special Paper

In addition to printing on single sheets and continuous paper, your printer can print on a wide variety of other paper types, such as envelopes, labels, postcards, roll paper, and multipart forms. before printing on special types of paper, you need to change the paper thickness setting.

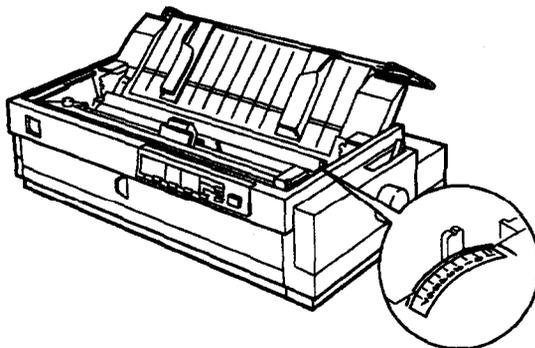


Caution:

- ❑ When printing on labels or multipart forms, make sure that your software **settings** keep the printing entirely within the printable area.
- ❑ Always return the paper **thickness** lever to position 0 when you return to printing on ordinary paper.

Adjusting the paper thickness lever

Set the paper thickness lever to match the thickness of your paper according to the table below.



Paper type	lever position
Thin paper	0 or 1
Ordinary paper (single sheets or continuous)	0
Multipart forms (carbonless) 2 sheets (original + 1 copy)	1
3 sheets (original + 2 copies)	3
4 sheets (original + 3 copies)	4
5 sheets (original + 4 copies)	5
6 sheets (original + 5 copies)	6
Labels. Postcards	2
Envelopes	4 to 5

Note:

- ❑ *When operating your printer under low temperature conditions (5°C or less), set the lever one position lower to improve print quality.*
- ❑ *When operating your printer under high temperature conditions (35°C or more), set the lever one position higher to improve print quality.*

Multipart forms

Your printer can print on both single-sheet and continuous multipart forms. You can load single-sheet multipart forms in both the front and top paper slots. You can load continuous multipart forms from the front, rear, and bottom.

Note:

Use only carbonless multipart forms.

You can use multipart forms of up to six parts, including the original. Make sure you set the paper thickness lever to the proper position.

You load multipart forms the same way as single sheets or continuous paper. For best results with continuous multipart forms, you should use the tractor installed in the pull tractor position and load paper from either the front or rear tractor. When you load paper from the front, you must use the optional pull tractor because the rear push tractor cannot be removed.

For details, see “Using Single Sheets” or “Loading Continuous Paper,” earlier in this chapter. Also be sure to set the loading position as described in “Micro Adjust” in Chapter 3.



Caution:

- ❑ *When printing multipart forms, make sure the printing stays entirely within the printable area of the forms. (For more information on the printable area, see the Appendix.)*
- ❑ *Use multipart forms only under normal operating conditions.*
- ❑ *When loading single-sheet multipart forms that are bound at the top by linegluing, always use the top paper path. (If you plan to print on forms that are joined at either the top or side by line gluing, use the front paper path.)*
- ❑ *Load multipart forms that are free of wrinkles and waves.*

Labels

When selecting labels for printing, always choose the type mounted on a continuous backing sheet with sprocket holes for use with a tractor. Do not try to print labels as single sheets because the shiny backing sheet does not feed properly.

Load labels from either the front or bottom (not rear) paper slots with the tractor in the pull tractor position. You load them the same way that you load continuous paper, except you set the paper thickness lever to position 2. See “Using Continuous Paper” earlier in this chapter for details.



Caution:

- ❑ Never *feed labels backward with the Load/Eject or Tear Off/Bin buttons. Labels can easily peel off the backing and jam the printer.*
- ❑ *Since labels are especially sensitive to temperature and humidity, use them only under normal operating conditions.*
- ❑ *Do not leave labels loaded in the printer between jobs; they curl around the platen and may jam when you resume printing.*
- ❑ *To remove labels from the paper path after you finish printing, first tear off the labels at a point before the paper slot. Then use the LF/FF button to advance the remaining labels out of the printer.*

Envelopes

You can load envelopes only from the top paper slot, following the guidelines below:

- ❑ **Always set the paper thickness lever to position 4 to 5 to match the thickness of the envelope.**
- ❑ **Always feed an envelope by pushing the wide edge into the printer until it meets resistance.**



Caution:

- ❑ *Use envelopes only under normal operating conditions.*
- ❑ *Printing on the edge of an envelope can damage the print head. Make sure the printing stays entirely within the printable area of the envelopes. See the Appendix **for** details.*

Postcards

You can load postcards from the front and top paper slots. Load cards only under normal operating conditions. Set the Card mode using the Tear Off/Bin button. See the Tear Off/Bin light and button descriptions in Chapter 3 for more information.

Note:

When the length of the card is less than 14.8 cm (5.8 inches), use the top paper slot. See the Appendix for details.

Use postcards only under normal operating conditions.

Roll paper

Load roll paper from the top paper slot. See “Roll paper holder” in Chapter 4 for more information.

Chapter 3

Using the Printer

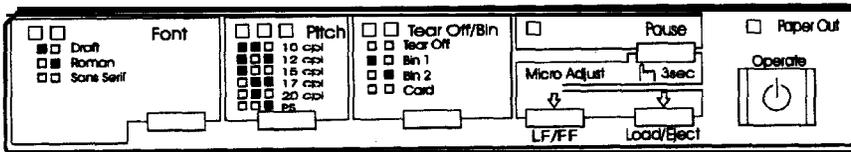
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This chapter covers basic operation of your printer, including the control panel lights and buttons, the printer's default settings, and other functions.

Control Panel

The indicator lights on the control panel let you monitor the current status of the printer, and the buttons let you control many printer settings.



Lights

Paper Out (**red**)

On when the printer runs out of paper or paper is jammed.

Pause (**orange**)

On when the printer is not ready to print data, paper is out *or jammed*, or the cover is open. The Pause light is off, unless you press the Pause button to pause printing. The Pause light flashes when the micro adjust function is enabled or the print head is too hot.

Tear Off /Bin (two lights, green)

The Tear Off /Bin selection status is displayed by two lights:

<input type="checkbox"/> <input type="checkbox"/>	Tear off position
<input checked="" type="checkbox"/> <input type="checkbox"/>	Bin 1
<input type="checkbox"/> <input checked="" type="checkbox"/>	Bin2
<input type="checkbox"/> <input type="checkbox"/>	Card

= Flashing, = On, = Off

- Both lights are off when continuous paper is not in the tear-off position.
- You can print postcards in Card mode.

Font (two lights, green)

The font selection status is displayed by two font lights on the control panel:

<input checked="" type="checkbox"/> <input type="checkbox"/>	Draft
<input type="checkbox"/> <input checked="" type="checkbox"/>	Roman
<input type="checkbox"/> <input type="checkbox"/>	sans serif

Pitch (three lights, green)

The pitch selection status is displayed by three pitch lights:

<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	10 cpi
<input checked="" type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	12 cpi
<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	15 cpi
<input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	17 cpi
<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	20 cpi
<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	PS (Proportional spacing)

= On, = Off

Note:

All of the lights above are on when a fatal error occurs.

Buttons

Operate

Press this button to turn the printer on or off.

Pause

Press this button to temporarily stop printing and to resume printing. Holding it down for at least 3 seconds when the printer is in the standby mode enables the micro adjust function. Pressing it again disables this function. See “Micro Adjust” later in this chapter for details.

Load/Eject

Press this button to load single-sheet or continuous paper to the loading position. However, the printer normally loads paper automatically. If single-sheet paper is already in the loading position, use this button to eject the sheet. If continuous paper is in the loading or tear-off position, press this button to feed it backward to the standby position.

LF/FF (line feed/form feed)

Press this button briefly to feed the paper forward one line. Hold the button down to eject a single sheet of paper or advance continuous paper to the top of the next page. You can also use this button to load a single sheet of paper from the cut-sheet feeder or to feed continuous paper from the standby position to the loading position.

Tear Off /Bin

Pressing this button moves a page to the tear-off position, and pressing it again moves the next page to the top-of-feed position. When cut sheets are used, pressing it selects the cut-sheet feed bin number. Use the Card mode (Bin 1 selected) to print on postcards.

Font

Press this button to select one of the following fonts:

Draft, Roman, Sans Serif

Pitch

Press this button to select one of the following pitches:

10 cpi, 12 cpi, 15 cpi, 17 cpi, 20 cpi, or proportional spacing (PS).

Note:

The typestyle samples on the control panel are meant as guides only; actual printed results may differ slightly.

Other control panel features

The control panel also gives you to access to several other functions. To activate the functions listed below, turn on the printer while pressing one of buttons, as follows:

Load/Eject	Performs a near letter quality self test. See Chapter 1 for details.
LF/FF	Performs a draft self test. See Chapter 1 for details.
Pitch	Activates the Default Setting mode. See “Changing the Default Settings” in this chapter.
Load/Eject and LF/FF	Prints a data dump. All the input data are printed as hexadecimal numbers and corresponding characters. See “Problems and Solutions” in Chapter 6.
Pause	Starts the Bid adjustment. See “Bid Adjustment” in this chapter.

Changing the Default Settings

The default settings control many basic functions of the printer. While you can control many of these functions through your software or printer driver, you may sometimes need to change a default setting from the printer's control panel through the Default Setting mode.

To enter Default Setting mode, hold down the Pitch button while turning on the printer. The printer prints an instruction sheet. Follow the instructions on this sheet, and in this section, to change settings using the Default Setting mode.

Selecting an instruction sheet language

Follow these steps to select the language in which you want to print the rest of the Default Setting mode instructions:

1. **Press the Pitch button until the Pitch lights indicate the language you want to select.**
2. **Press the Tear Off /Bin button to save your selection.**
3. **Press the Font button to print out the instruction.**

Selecting items and changing settings

Follow the steps below to select items and change their settings. The available items and settings are listed on the instruction sheet and in the table on the next page.

1. Press the Pitch button until the Pitch lights indicate the item you want to change.
2. Press the Tear Off/Bin button until the setting you want to use for that item is indicated by the Tear Off/Bin and Pause lights.
3. Repeat steps 1 and 2 for any additional items you want to change. Each time you press the Tear Off/Bin button, the printer saves the settings you selected.
4. When you finish changing the settings, turn off the printer.

The following table lists the items you can change and their available settings. Default settings are bold. Each item is described in the following section.

Item	Settings
Character table	Standard model: Italic, PC 437, PC 850, PC 860, PC 863, PC 865, PC 861, BRASCII, Abicomp, ISO Latin 1, Roman 8 All other models: Italic, PC 437, PC 437 Greek, PC 850, PC 852, PC 853 , PC 855, PC 857, PC 866, PC 869, ISO Latin 1T. ISO 8859-7. MAZOWIA, Code MJK, Bulgaria, Estonia, PC774, ISO Latin 2, PC 866 LAT.
International character set for italic table	Italic U.S.A. Italic France, Italic Germany, Italic U.K., Italic Denmark, Italic Sweden, Italic Italy, Italic Spain
Page length for front tractor	3, 3.5, 4, 5.5, 6, 7, 8, 8.5, 11, 70/6, 12, 14.17 inches

Item	Settings
Page length for rear tractor	3, 3.5, 4, 5.5, 6, 7, 8.5, 11,70/6, 12, 14, 17 inches
High speed draft	On Off
Print direction	BI-d., Uni-d.
Software	ESC/P, IBM 2381 plus
Interface mode	Auto, Parallel I/F, Option I/F
Auto interface wait time	10 sec.. 30 sec.
Input buffer	On, Off
Skip-over-perforation	on.011
Auto tear off	On. Off
Auto line feed	on, off
Auto CR '2	on, Off
0 slash	On, Off
Buzzer	On, Off
Roll paper	On, Off

Default setting item functions

This section describes each of the default setting item functions.

Character table

Your printer has 11 standard character tables as well as tables for 19 other countries. See the Appendix for character samples.

International character set for Italic table

You can change 8 characters in the Italic character table to suit your printing needs. Since these characters are often used in other languages, they are named after countries and are referred to as international character sets. See the Appendix for character samples.

Page length for front and rear tractor

For paper fed through the front or rear tractor, you can set the page length to one of the following: 3, 3.5, 4, 5.5, 6, 7, 8, 8.5, 11, 70/6, 12, 14, or 17 inches.

High speed draft

When you select high speed draft, the printer can print up to 440 cps (characters per second) at 10 cpi in draft mode. If you select normal speed draft, it prints up to 330 cps at 10 cpi in draft mode.

Print direction

You can select auto print direction, unidirectional printing, or bidirectional printing. Printing is normally bidirectional; however, unidirectional printing allows for precise vertical printing alignment.

Software

When you select ESC/P, the printer operates in the EPSON ESC/P mode. When you select IBM, the printer emulates an IBM printer.

Interface mode

The printer has two interfaces: parallel and Type-B (optional). You can choose parallel, optional, or automatic for the interface mode.

Auto interface wait time

The printer determines which interface is receiving data and switches to that interface until the end of the print job (when no data is received from the selected interface for the amount of time specified). You can specify either 10 seconds or 30 seconds.

Input buffer

The input buffer stores data sent from your computer. The input buffer can store up to 64KB of data, so you can free your computer for other tasks while the printer prints. When the buffer is off, the buffer can store no data, so the computer must wait for the printer to print each character before sending the next.

Skip over perforation

This feature is available only when continuous paper is selected. When you turn on this feature, the printer provides a one-inch (25.4 mm) margin between the last line printed on one page and the first line printed on the next page. because most application programs set their own top and bottom margins, you should use this feature only if your program does not provide them.

Auto tear-off

When you use continuous paper with the front or rear push tractor, this feature advances the paper perforation to the tear-off position, where you can then easily tear off the printed page. When the printer again receives data, it automatically advances the paper to the top-of-form position and starts printing, so you can use all of the next sheet. When auto tear-off is disabled (off), you must perform the tear-off function manually by pressing the Tear Off /Bin button. See “Tear Off” later in this chapter for more information.

Auto line feed

When auto line feed is on, the printer accompanies each carriage return (CR) code received with a line feed (LF) code.

Auto carriage return

When the auto carriage return feature is on, each line feed (LF) code or ESC J (n/216-inch line feed) code is accompanied by a carriage return (CR) code and the printer moves the next print position to the left margin. When this feature is off, you must send the CR code after the line feed code to move the print position to the left margin. This feature is available in IBM emulation mode only.

0 slash

The zero character has a slash (Ø) when this setting is on; it has no slash (0) when the setting is off. This allows you to easily distinguish between an uppercase “O” character and a zero.

Buzzer (Beep)

The printer beeps when some errors occur. See “Troubleshooting” in Chapter 6 for more information.

Roll paper

When you turn on this mode, roll paper is not recognized as single-sheet paper even if the paper release lever is set to the single-sheet position. This means that the paper is not ejected and advanced forward to the next page with the LF/FF button.

Micro Adjust

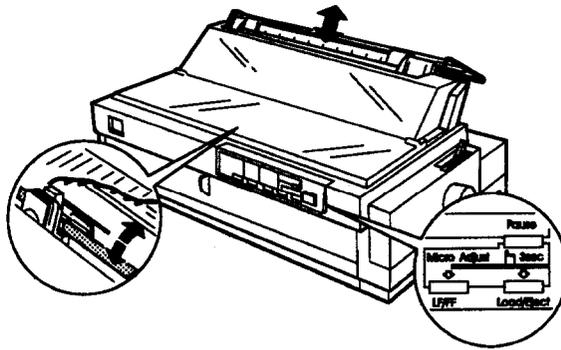
The micro adjust feature allows you to move paper forward or backward in 1/216-inch increments. You can use this feature to adjust the loading and tear-off positions.

This section explains how to use micro adjust. See the next section for information on adjusting the tear-off position.

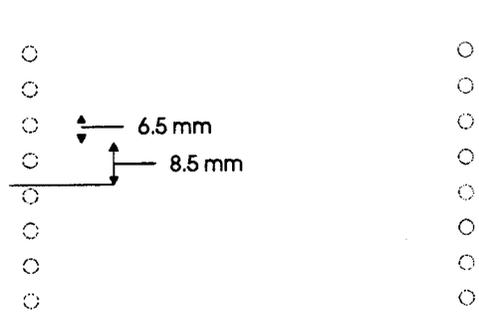
The loading position is the position of the paper after it has been automatically loaded by the printer. If your printing appears too high or low on the page, change the loading position with the micro adjust feature as follows:

1. Make sure the printer is turned on. If necessary, lift the printer cover up so you can see the paper position.
2. Load either continuous or single-sheet paper. (Load continuous paper by pressing the Load/Eject button.)
3. Hold down the Pause button for three seconds. The Pause light starts flashing.

4. Press the Load/Eject [] button to move the loading position down on the page, or press the LF/FF [] button to move the loading position up on the page.



For continuous paper, mark a point 6.5 mm above the perforation and position the paper as shown. This gives you an 8.5 mm margin.



Note:

- ❑ The printer has a minimum and maximum loading position. If you try to advance the loading position beyond these limits, the printer beeps and the paper stops moving.
- ❑ When the paper reaches the factory-set loading position, the printer beeps and paperfeeding pauses briefly. Use the factory setting as a reference point when adjusting the loading position.

5. **Press the Pause button or send data to the printer to leave the micro adjust mode.**

Note:

For both cut sheet and continuous paper, the printer remembers this new position even after it has been turned off and back on.

Tear-Off

After you have finished printing, you can use the tear-off feature to advance continuous paper on the push tractor to the tear-off edge of the printer. You can then easily tear off printed sheets. When you resume printing the printer automatically feeds paper back to the loading position so you can save paper that would normally be lost between documents.

You can use the tear-off feature in two ways: by setting the default setting to select auto tear-off mode, or by pressing the Tear Off /Bin button on the control panel.

If the perforation between pages is not aligned with the tear-off edge, you can adjust the tear-off position using the micro adjust feature as described in the previous section.



Caution:

- Never use the tear-off feature to reverse-feed labels; they may come off their backing and jam the printer.*
- Never reverse-feed continuous paper when using the pull tractor; the paper could come off the pull tractor and jam the printer.*

Using auto tear-off mode

When you select the auto tear-off mode default setting, the printer advances continuous paper to the tear-off position when you finish printing.

The printer advances paper to the tear-off position only when the printer receives a full page of data or a form-feed command and no more data is received for three seconds.

Select tear-off using the Default Setting mode as described earlier in this chapter. Also make sure the page length for continuous paper is selected correctly in the Default Setting mode. Be sure you turn off the printer to exit from the Default Setting mode, and then turn it on again.

1. Print on continuous paper loaded on the front or rear push tractor (as described in Chapter 2). When you finish printing, the printer advances the perforation of the final printed page to the tear-off position.
2. Tear off all printed pages.
3. When you resume printing, the printer automatically feeds the paper back to the loading position and begins printing. If the perforation does not meet the tear-off edge, you can adjust the tear-off position using the micro adjust feature as described in the previous section.

You can leave auto tear-off mode on even when you are using single sheets because the mode is disabled when you move the paper release lever to the single-sheet position.

Note:

Don't turn on the auto tear-off mode when using the pull tractor. Set auto tear-off mode to off in the Default Setting mode, or avoid touching the Tear Off/Bin button when using the pull tractor.

Using the Tear Off/Bin button

Whether or not the printer is in auto tear-off mode, you can use the Tear Off/Bin button to advance continuous paper to the tear-off position by following the steps below:

1. **Make sure printing has finished. Then press the Tear Off/Bin button until the two lights on the control panel start flashing. The printer advances the paper to the tear-off edge.**
2. **Tear off all printed pages. If the perforation is not aligned with the tear-off edge, adjust the tear-off position using the micro adjust feature. See “Micro Adjust,” earlier in this chapter.**
3. **When you resume printing the printer feeds the paper back to the loading position and begins printing. (You can also manually feed the paper back to the loading position by pressing the Tear Off /Bin button.)**

Bi-d Adjustment

When using bidirectional printing, you may notice that the lines in your printout are not properly aligned. To correct this problem, use the printer’s Bid Adjustment mode as follows:

1. **Make sure continuous paper is loaded in the printer.**
2. **Hold down the Pause button while you turn on the printer. The instructions for adjusting Bid alignment are printed, along with the first set of alignment patterns.**
3. **Follow the instructions on the printout.**
4. **After completing Bid adjustment, turn off the printer.**

Barcode Printing

Your printer has powerful barcode printing capabilities and includes the following resident barcode fonts: EAN-13, EAN-8, Interleaved 2 of 5, UPC-A, UPC-E, Code 39, Code 128, and POSTNET. See the Appendix for more information about the Barcode Print command.

Chapter 4

Using Printer Options

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This chapter describes how to use optional equipment with your printer, including cut-sheet feeders, a pull tractor, a roll paper holder, and interface cards.

Cut-Sheet Feeders

Two cut-sheet feeders are available for use with your printer.

Printer model	High capacity (Bin 1)	Second bin (Bin 2)
Fx-2170	C80673*	C80674*

The asterisk (*) is a substitute for the last digit, which varies by country. Contact your local EPSON dealer for the part number in your country.

By connecting both cut-sheet feeders, you can operate them as a double bin cut-sheet feeder. This allows you to load two different types of paper. See “Assembling the double bin cut-sheet feeder” later in this chapter.

Before you install your cut-sheet feeder, assemble it by following the instructions in the manual that comes with it.

Note:

The second bin cut-sheet feeder can only be used in combination with the high capacity cut-sheet feeder.

Installing the high capacity cut-sheet feeder

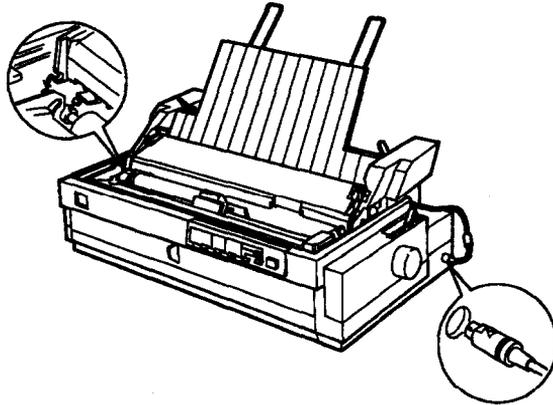
- 1. Make sure the printer is turned off.**
- 2. Remove the paper guide and the printer cover.**

3. If the standard tractor is installed in the pull tractor position, remove it. If the optional pull tractor is installed, remove it. In either case, make sure the paper tension unit is not installed.

Note:

Store the paper guide and optional pull tractor in a safe place; you will need them if you remove the cut-sheetfeeder.

4. Move the printer head to the ribbon installation position.
5. Hold the cut-sheet feeder in both hands and press back the latch levers on each side. Fit the notches in the cut-sheet feeder over the mounting posts on the printer. Release the latch levers and lower the cut-sheet feeder until it rests on the printer.



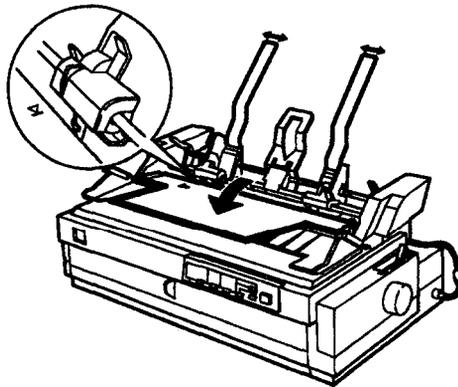
6. Insert the cable into the connector as shown above.
7. Replace the printer cover.

You are now ready to load paper with your cut-sheet feeder. To remove the cut-sheet feeder, reverse the steps above.

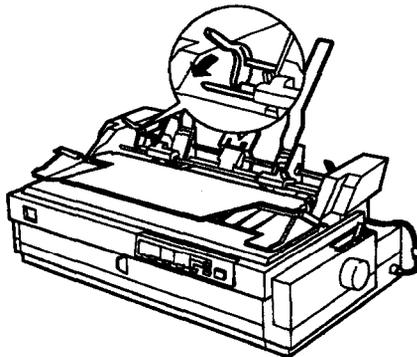
loading paper with the high capacity cut-sheet feeder

Load paper using the high capacity cut-sheet feeder as follows:

1. Turn off the printer.
2. Push down the center support. Slide the left paper guide so it is aligned with the arrow mark on the back side of the center support. Next, slide the right paper guide to match the width of your paper. Slide the paper stacker midway between the paper guides.



3. Pull the paper-set levers all the way forward until the paper guides retract and lock open to allow for paper loading.



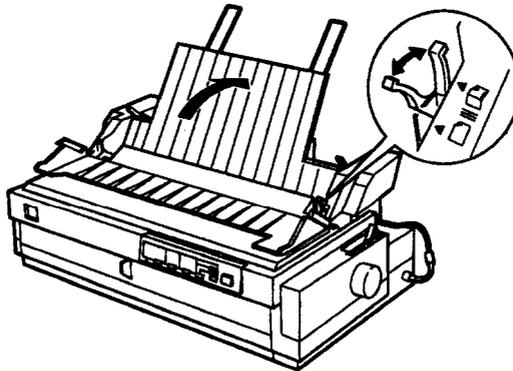
4. Fan a stack of paper (up to 150 sheets); then tap the side and bottom of the stack on a flat surface to even it up.



Caution:

Do not use labels in the cut-sheet feeder.

5. Insert the paper along the left paper guide.
6. Adjust the position of the right paper guide so that it matches your paper's width. Make sure the position of the guide allows the paper to move up and down freely.
7. Push back the paper-set levers to clamp the paper against the guide rollers.
8. Lift up the center support and select single sheet or continuous paper by moving the paper selection lever as shown below.



Note:

When the cut-sheet feeder is installed, you can still load single sheets using the top paper guide or the front paper slot.

The cut-sheet feeder loads paper when you send data to the printer (as long as the Pause light is not on). You can also load paper by pressing the Load/Eject button.

Assembling the double bin cut-sheet feeder

You can connect the high capacity cut-sheet feeder to the second bin cut-sheet feeder to create a double bin cut-sheet feeder. See the cut-sheet feeder option manuals for more information.

You cannot use the second bin feeder without the high capacity feeder.

- 1. Install the assembled double bin cut-sheet feeder on the printer. See “Installing the high capacity cut-sheet feeder” in the previous section.**
- 2. Select the bin number by pressing the Tear Off/Bin button. The light of the currently selected bin comes on.**

Note:

You may be able to specify the bin number using your application programs. See your software manuals for details.

Switching between continuous paper and the cut-sheet feeder

You can easily switch between continuous paper and cut-sheet feeder operation without removing the continuous paper.

Switching to continuous paper

- 1. If any single sheets are in the paper path, press the Load/Eject button to eject them.**
- 2. Move the paper release lever to the push tractor position.**
- 3. Move the paper selection lever to the continuous paper position.**

Note:

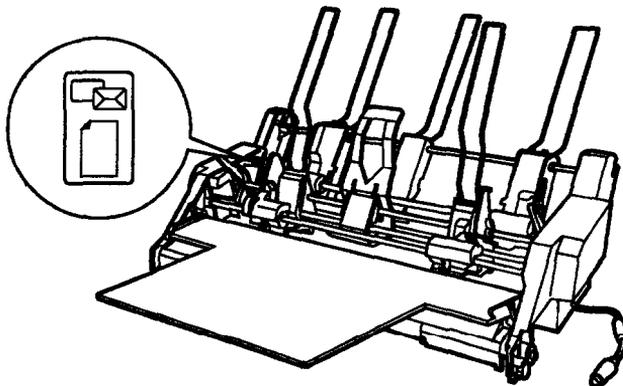
When you print several pages of continuous paper, guide the paper over the center support and out the back of the printer, as it prints.

Switching to the cut-sheet feeder

1. **If any printed continuous paper remains in the printer, press the Tear Off/Bin button to advance the paper to the tear-off position.**
2. **Tear off the printed pages.**
3. **Press the Load/Eject button. The printer feeds the paper backward to the standby position. The paper is still attached to the push tractor but is no longer in the paper path.**
4. **Move the printer's paper release lever to the single-sheet position.**
5. **Move the cut-sheet feeder's paper selection lever to the single-sheet position.**

Selecting single-sheets, postcards, or envelopes

You can select either single-sheet paper, postcards, or envelopes using the lever on the first bin. You'll see the icons next to the lever. Move the lever to the proper position before loading your paper.



Pull Tractor

The optional pull tractor (C80032*) provides optimum continuous paper handling. (The asterisk (*) is a substitute for the last digit of the product number, which varies by country.)

The pull tractor is especially useful with continuous multipart forms. For best results, use the optional pull tractor along with your standard tractor installed in the front push tractor position. See Chapter 2 for instructions.

Note:

You cannot remove the rear push tractor. When you load continuous paper from the front paper path with the pull tractor on top, you can install the optional pull tractor in the pull tractor position.

Loading paper with the push tractor and the optional pull tractor

- 1. Make sure the printer is turned off and the standard tractor is installed in the push tractor position.**
- 2. Remove the paper tension unit by lifting it up and off the printer.**
- 3. Install the optional pull tractor in the pull tractor position as described in “Using the pull tractor position” in Chapter 2.**

Note:

The optional pull tractor cannot be installed in the rear push tractor position.

- 4. Make sure that the paper release lever is in the push tractor position.**
- 5. Load the paper in the push tractor as described in Chapter 2.**
- 6. Press the LF/FF button to advance the paper to the next page.**

7. Fit the paper to the pull tractor's sprocket.
8. Move the paper release lever to the pull tractor position and use micro adjust, described in Chapter 3, to remove any slack in the paper.
9. Move the paper release lever back to the push tractor position.
10. Attach the paper guide and printer cover. Raise the paper path guide and rest it against the paper guide.

Note:

When you are using more than one continuous paper source, guide the paper over the paper guide and feed it out the back of the printer, as it prints.



Caution:

Do not use the knob on the right side of the printer except to clear paper jams when the printer is off. Otherwise, you may damage the printer or cause it to lose the top-of-form position.

Roll Paper Holder

The optional roll paper holder (#8310) allows you to use your printer with 8.5-inch roll paper like that used with telex machines. Before you use roll paper, set the default setting of roll paper to on. See “Changing the Default Settings” in Chapter 3 for details.

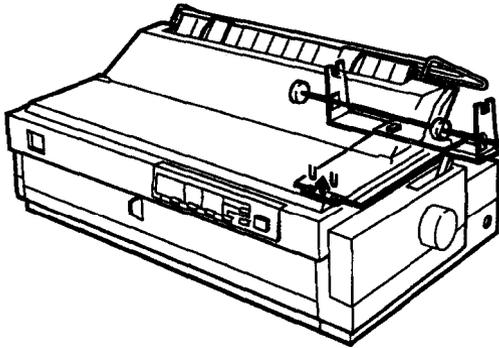
To use the roll paper holder, follow the steps below.

Note:

This option is not available in all countries.

1. **Turn off the printer and make sure the paper release lever is at the single-sheet position.**

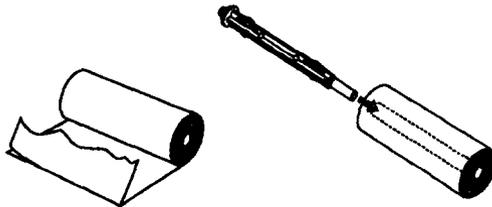
2. Position the roll paper holder beneath the printer as shown below. Fit the two holes in the base onto the two positioning pegs on the bottom of the printer.



Caution:

Be careful to avoid dropping the roll paper holder when lifting the printer. Only the printer's weight holds it in place.

3. Cut the leading edge of the roll paper straight across. Slide the roll paper holder shaft through the center of the paper roll.

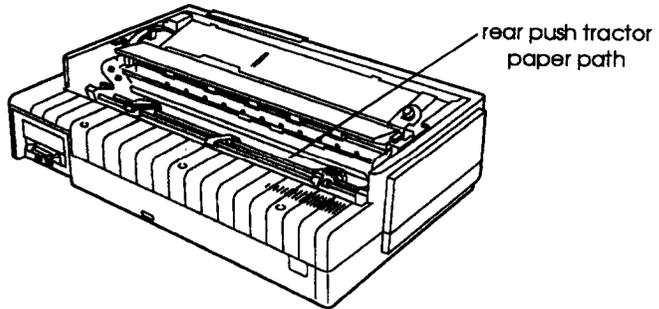


4. Set the shaft and paper roll onto the roll paper holder so that paper feeds from the bottom of the roll.

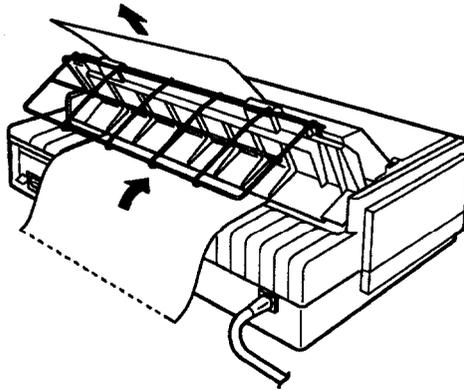
5. **Bring the leading edge of the paper up over the rear push tractor and insert it into the printer path until you feel resistance.**

Note:

Use the rear push tractor paper path as shown below.



6. **Install the paper guide and the printer cover.**
7. **Turn on the printer. The roll paper loads automatically.**



Interface Cards

You can use optional interface cards to supplement your printer's built-in parallel interface. The EPSON interface cards below are compatible with your printer. (Not all interfaces are available in all countries.)

Model number	Name
C82305* / C82306*	Serial interface card
C82307* / C82308*	32KB intelligent serial interface card
C82310* / C82311*	32KB intelligent parallel interface card
C82312*	LocalTalk interface card
C82313*	32KB IEEE-488 interface card
C82314*	Coax interface card
C82315*	Twinax interface card
C82331*	Ethernet interface card

The asterisk (*) is a substitute for the last digit, which varies by country.

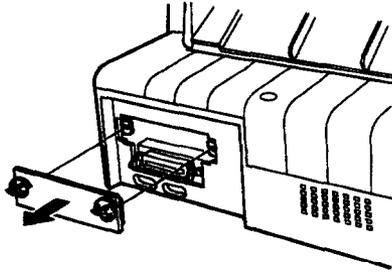
If you are unsure whether you need an optional interface or would like to know more about interfaces, contact your dealer.

Installing an interface card

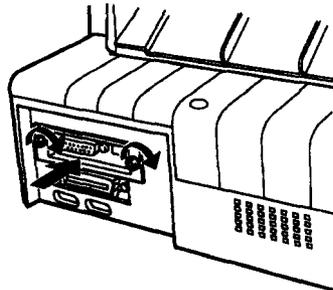
Follow the steps below to install an optional interface card.

- 1. Make sure the printer is turned off. Unplug the printer's power cord and disconnect the interface cable.**

2. Remove the screws from the shield plate on the back of the printer and remove the plate.



3. Slide the interface card along the slots on both sides of the interface compartment. Push in firmly to make sure you fully insert the connector at the back of the interface card into the printer's internal socket. Then re-insert the screws and tighten them.



To remove the interface card, reverse the steps above.

The C82305 or C823306* serial interface card*

To use the C82305* or C82306* serial interface card, see the sections below to set the correct baud rate, handshake timing, and error handling. For all other data transfer conventions, such as word structure and communications protocol, see the C82305* or C82306* interface card manual.

Selecting a baud rate

You can select from the following baud rates: 300, 600, 1200, 2400, 4800, 9600, and 19200 bps (bits per second). To set the baud rate, see the bit-rate selection table in the C82305* or C82306* interface card manual.

Handshake timing

When the unused area for data in the input buffer drops to 256 bytes, the printer outputs an X-OFF code or sets the DTR flag to 1 (MARK) to indicate that it cannot receive data. When the unused area increases to 512 bytes, the printer outputs an X-ON code or sets the DTR flag to 0 (SPACE) to indicate that it is ready to receive data.

Chapter 5

Maintenance and Transportation

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Replacing the Ribbon 5-3
Transporting the Printer 5-4

Cleaning the Printer

To keep your printer operating at its best, you should clean it thoroughly several times a year. Follow these steps:

1. **Make sure the printer is turned off. Then remove any paper as well as the paper guide and tractor unit. Also remove the optional pull tractor and cut-sheet feeders, if installed.**
2. **Use a soft brush to carefully brush away all dust and dirt from the outer case.**
3. **If the outer case or paper guide is still dirty, clean it with a soft, clean cloth dampened with mild detergent dissolved in water. Keep the printer cover in place and close the paper-guide cover to prevent water from getting inside the printer.**



Warning:

Be careful not to get water on the printer mechanism or electronic components.



Caution:

- Never use alcohols or thinners to clean the printer; these chemicals can damage the components and the case.*
- Do not use a hard or abrasive brush.*
- Do not spray the inside of the printer with lubricants; unsuitable oils can damage the mechanism. Contact your dealer if lubrication is needed.**

Replacing the Ribbon

When printing becomes faint, you need to replace the ribbon cartridge. Use the EPSON ribbon cartridges listed below for best results. Genuine EPSON ribbons are designed to work properly with your EPSON printer; their high quality ensures proper operation and a long life for the print head and other printer parts. Using any other ribbon may damage your printer.

Printer model	Ribbon cartridge	Ribbon pack
FX-2170	S015085	S010032

To replace the ribbon cartridge, follow the steps in “Installing the Ribbon Cartridge” in Chapter 1.

Note:

- ❑ *Do not use a ribbon cartridge designed for 24-pin printers.*
- ❑ *The ribbon pack can be replaced only four times, after which you must replace ribbon cartridge itself.*

Transporting the Printer

If you need to transport your printer some distance, carefully repack it using the original box and packing materials, as described below:

- 1. Turn off the printer.**
- 2. Unplug the power cord from the electrical outlet; then disconnect the interface cable from the printer.**
- 3. Remove the paper guide.**
- 4. Remove the optional pull tractor, cut-sheet feeder, or roll-paper holder if installed.**
- 5. Remove the ribbon cartridge.**
- 6. Remove the paper-tension unit. Attach the protective locking clip to the paper-tension unit, and then replace the paper tension unit.**
- 7. Make sure the standard tractor is installed in the push tractor position.**
- 8. Repack the printer, ribbon cartridge, paper guide, and power cord in the original packing materials and place them in the printer's original box.**

Chapter 6

Troubleshooting

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Most printer problems have simple solutions.

You can check the operation of your printer using the self test. See “Running the Self Test” in Chapter 1. If the self test works properly, the problem probably lies in the computer, software, or interface cable. If the self test does not work, contact your dealer or qualified service person for assistance.

Note:

If you are an experienced user or a programmer, you can print a hexadecimal dump to isolate communication problems between the printer and computer. To print a hex dump, turn off the printer. Next, hold down the LF/FF and Load/Eject buttons while you turn on the printer. Then send data from your computer. The printer prints all the codes it receives in hexadecimal format.

Power Supply

This section describes solutions for problems related to the power supply.

Power is not being supplied

The lights on the control panel do not go on.

Check that the power cord is properly plugged into the electrical outlet.

If the electrical outlet is controlled by an outside switch or automatic timer, use a different outlet.

Plug another electrical device, such as a lamp, into the outlet to determine whether the outlet is operating properly.

The lights come on briefly and then go off. The lights stay off even when the power is turned on again.

Check that the printer's voltage rating matches the voltage of your electrical outlet. If the voltages do not match, unplug the printer and contact your dealer immediately. Do not reconnect the power cord to an electrical outlet.

Printing

See this section if you have problems printing.

The printer does not print

The Pause light is off but nothing is printed.

Check that the software is installed properly for your printer. Check the software's printer settings.

Check both ends of the interface cable. Make sure the cable meets both the printer and computer specifications.

The Pause and Paper Out lights are flashing and the printer beeps three times.

The printer may be out of paper. Load paper in the printer.

The printer sounds like it is printing, but nothing is printed.

The ribbon cartridge may not be installed properly. Follow the steps in Chapter 1 to make sure it is installed correctly.

The ribbon may be worn out. Replace the ribbon cartridge.

The printer makes a strange noise, beeps five times, and then abruptly stops printing.

Turn off the printer and let the print head cool. Then, check for a paper jam, a ribbon jam, or other problems. Try to print again. If the printer still does not print correctly, contact your dealer.

The printer beeps several times.

An error has occurred. Turn off the printer and turn it on again.

If the printer beeps three times, check to see if the paper has run out or the printer cover is open.

If the printer beeps five times, check for a paper jam and make sure the paper release lever is in the correct position.

If the printer beeps once, you may have tried an invalid control panel operation. Review the control panel functions in Chapter 3.

If the printer still does not work correctly, turn it off and contact your dealer or qualified service person.

The print is faint or uneven

Printed characters have parts missing at the bottom.

The ribbon cartridge may not be installed properly. See Chapter 1 for installation instructions.

The printout is faint.

The ribbon may be worn out. Replace the ribbon cartridge as described in Chapter 1.

The paper thickness lever may not be set properly. See “Adjusting the paper thickness lever” in Chapter 2.

Dots are missing in printed characters or graphics

A line of dots is missing in the printout.

The print head is damaged. Stop printing and contact your dealer to have the print head replaced.

Dots are missing in random positions.

Either there is too much slack in the ribbon or the ribbon has come loose. Reinstall the ribbon cartridge as described in Chapter 1.

Printed characters are not what you expect

The typestyles or characters you sent with your software did not print.

Check that the software is correctly configured for your printer. For instructions, see “Setting Up Your Software” in Chapter 1.

The font selected on the control panel does not print.

Your software may be overriding your control panel setting. Select the font in your software program.

The print position is not what you expect

Printing starts too high or too low on the page, or the bottom part of one page is printed at the top of the next page.

You can adjust the loading position using the LF/FF button in the micro-adjust mode. See “Micro Adjust” in Chapter 3.

When you print on single sheets, if the printer prints the first page of your file correctly but then prints too low on the next page, or prints the last few lines from one page onto the next, change some of the settings in your application programs, as follows:

1. When you install an application program, it normally asks you what printer you are using. Make sure you choose the correct printer. See your user’s guide for the right printer to choose.
2. Many programs include an option to set the maximum lines per page. If your program has a lines-per-page setting and you are using standard 8 $\frac{1}{2}$ x 11-inch paper, set the lines per page to 61, except for the ActionPrinter™ T-1000, for which you use 58.

Note:

To find the right lines-per-page setting for paper that is not 8 $\frac{1}{2}$ x 11, create a test document using your application program. Set your top and bottom margins to 0 and then create a file of numbered lines from 1 to 66. When you print your file, notice the last number printed on the first page. This is your maximum lines-per-page setting.

3. If your program doesn’t have a lines-per-page setting, try decreasing the top margin or increasing the bottom margin, or both, until you get the results you want.

4. You can also try adjusting the form length setting. For a standard 8 1/2 x 11-inch page, try setting the form length at 10 inches.
5. Some programs also let you indicate whether you are using single sheets or continuous paper. Make sure you choose single sheets.

Page length does not match the length of the paper.

Check the page length set by your software and adjust it if necessary.

If you are using continuous paper, change the page length using the Default Setting mode. See "Changing the Default Settings" in Chapter 3.

Regular gaps occur in the printout.

Skip-over-perforation may be on. Set skip-over-perforation to Off in the Default Setting mode. See "Changing the Default Settings" in Chapter 3.

Paper Handling

See this section if you have problems with paper.

Single sheets do not feed properly

Paper does not feed.

Continuous paper may be left in the printer. Remove the continuous paper. Set the paper release lever to the single-sheet position and insert a new sheet.

Paper feeding is crooked or the paper jams.

Turn off the printer and pull out the paper. Insert a new sheet straight into the paper guide. Be sure, you're using the right type of paper. See the paper specifications in the Appendix.

Make sure that the printer cover is closed.

Paper does not eject completely.

Use the LF/FF button to eject the page.

Make sure the printer cover is closed.

The paper may be too long. Use paper that is within the specified range. See the paper specifications in the Appendix.

Continuous paper does not feed properly

The tractor does not feed the paper.

Check that the paper release lever is pulled forward to the continuous paper position. If not, move the lever to the correct position.

The paper may have come off the tractor. Re-attach the paper to the tractor.

Paper feeding is crooked or the paper jams.

Make sure the paper guide is in the upright position.

The position of your paper supply may be preventing it from feeding straight. Make sure the paper supply is not obstructed.

Make sure your paper supply is positioned within 1 meter (3 feet) of the printer.

Make sure the printer cover is closed.

Check that the holes on the sides of the paper are aligned with each other. Also, make sure the sprockets are locked and their covers are closed.

Check that the paper size and thickness are within the specified ranges. See the paper specifications in the Appendix.

The paper does not eject properly.

Tear off the paper entering the printer, then press the LF/FF or Load/Eject button to feed the paper forward. See “Tear-Off” in Chapter 3.

When you switch between single sheets and continuous paper, the printer beeps several times and the Pause light comes on.

You may have tried to change the paper release lever position while paper was still in the printer. Return the paper release lever to the original position and eject the paper. Then change the lever position.

Options

See this section if you have problems with optional equipment.

The paper does not feed properly with the cut-sheet feeder

The paper does not feed.

The cut-sheet feeder may be incorrectly installed. Reinstall it as described in Chapter 4.

You may have loaded too many sheets in the cut-sheet feeder's bin. Make sure the bin contains no more than 150 sheets.

Paper may be jammed near the print head. Look for a paper jam and remove it.

Make sure the edge guide positions on the paper guide of the cut sheet feeder are correct. Position the edge guides at the diamond-shaped guide marks.

There may be only one sheet left in the bin. Add more paper.

Two or more sheets feed at one time.

You may have loaded too many sheets in the cut-sheet feeder's bin. Make sure the bin contains no more than 150 sheets.

You may have forgotten to fan the stack of paper before loading it into the bin, Remove the paper, fan it, and re-load it.

The paper feed is crooked.

The paper may be old or creased. Use only new, clean sheets of paper.

There may be too much paper in the stacker.

Make sure the paper guides are set correctly and your paper is the proper size and quality. See the Appendix for paper specifications.

One page of your document has printed on two pages.

Check that the page-length setting and lines-per-page setting in your software are correct. Also see “Changing the Default Settings” in Chapter 3.

The desired paper type does not load when switching between the cut-sheet feeder and the push tractor.

The paper release lever may not be in the proper position. Pull the lever forward to load continuous paper or push the lever back to load single sheets.

Continuous paper does not feed properly when using the pull tractor with the push tractor

Paper feed is crooked or the paper jams.

The pull tractor and push tractor sprockets are not aligned correctly. When using both tractors, be sure that the sprockets on both are positioned evenly.

The paper may have too much slack. Adjust the position of the sprockets to take up any slack along the width of the paper. Remove slack lengthwise by rotating the knob of the pull tractor.

Appendix

Specifications, Command Summary, and Character Tables

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Printer Specifications

Printing

Printing method: 9-pin impact dot matrix

Printing speed:

Quality	Characters per inch	Characters/second/line
High speed draft	10	440
D r a f t	10	330
	12	396
	15	330
Draft condensed	17	283
	20	330
Draft emphasized	10	165
Near letter quality	10	66
	12	79
	15	66

- The paper thickness lever position or an overheated print head may slow down the printing speed.

Printable columns:

<i>character sizes</i>	Maximum printed characters per column
10 cpi	136
12 cpi	163
15 cpi	204
17 cpi condensed	233
20 cd condensed	272

Printing direction:	Bidirectional logic-seeking for text and graphics
Line spacing:	1/6 inch or programmable in increments of 1/216 inch
Paper feed speed:	47 msec in 1/6-inch feed 0.127 m/sec. in continuous feed (5.0 inches/sec. in continuous feed)
Buffer:	OK byte or 64K byte* * Depends on default settings
Character tables:	11 standard, 19 other character tables
Character sets:	13 international character sets
Bit map fonts:	3 bit map fonts
Barcode fonts	8 fonts

Paper

Single sheets (CSF):	both front and rear entry
Width:	101 to 420 mm (4.0 to 16.5 inches)
Length:	Front: 147 to 420 mm (5.8 to 16.5 inches) Rear: 101 to 420 mm (4.0 to 16.5 inches)
Thickness:	0.065 to 0.14 mm (0.0025 to 0.0055 inch)
Weight:	52.3 to 90 g/m ² (14 to 24 lb)
Single sheets (multipart)*:	both front and rear entry
Width:	101 to 420 mm (4.0 to 16.5 inches)
Length:	Front: 147 to 420 mm (5.8 to 16.5 inches) Rear: 101 to 420 mm (4.0 to 16.5 inches)
Copies:	1 original + 5 copies
Thickness:	0.12 to 0.46 mm (0.0047 to 0.018 inch)
Weight:	40 to 58 g/m ² (12 to 15 lb)
Jointing:	Line glue at the top or on both sides of form (single side line glue is available only with front entry)

*Use under normal operating conditions.

Envelopes*:	rear entry only
Size:	No. 6: 166 x 92 mm (6.5 x 3.6 inches) No. 10: 240 x 104 mm (9.5 x 4.1 inches)
Thickness:	0.16 to 0.5 mm (0.0063 to 0.0197 inch)
Weight:	45 to 91 g/m ² (12 to 24 lb)

*Use under normal operating conditions.

Postcards*:	both front and rear entry
Width:	100 to 148 mm (3.9 to 5.83 inches)
Length:	Front: 148 mm (5.83 inches) Rear: 100 to 148 mm (3.94 to 5.83 inches)
Thickness:	0.22 mm (0.0087 inches)
Weight:	192 g/m² (51 lb)

*Use under normal operating conditions.

Continuous paper

(single sheet and multipart): front, rear, and bottom entry

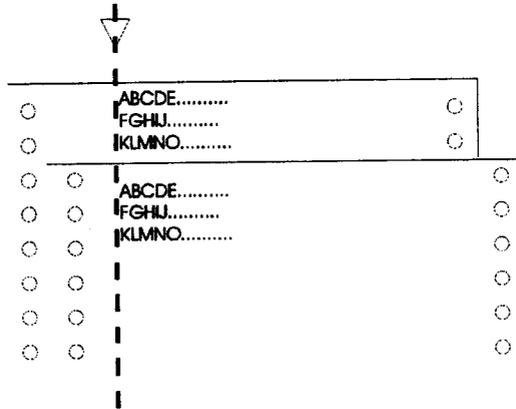
Width:	101 to 406 mm (4 to 16 inches)
Length:	101 to 559 mm (4 to 22 inches)
Copies:	1 original + 5 copies
Thickness:	0.065 to 0.46 mm (0.0025 to 0.018 inch)
Weight (not multipart):	52.3 to 82 g/m² (14 to 22 lb)
Weight (one sheet of multipart):	40 to 58 g/m² (12 to 15 lb)
Joining:	Line glue at the top or on both sides of form Line glue on single side of form (rear entry only)

Continuous paper with labels:	front and bottom entry
Label size:	23.8 x 63.5 mm (15/16x 2.5 inches) minimum
Base sheet width:	101 to 406 mm (4 to 16 inches)
Base sheet hmgth (one page):	101 to 406 mm (4 to 16 inches)
Base sheet thickness:	0.07 to 0.09 mm (0.0028 to 0.0035 inch)
Total thickness:	0.16 to 0.19 mm (0.0063 to 0.0075 inch)
Label weight:	68 g/m² (17 lb)
Roll paper:	rear entry only
Width:	216 ± 3 mm (8.5 ± 0.12 inches)
Thickness:	0.07 to 0.09 mm (0.0028 to 0.0035 inch)
Weight:	52.3 to 82 g/m² (14 to 22 lb)

Paper alignment

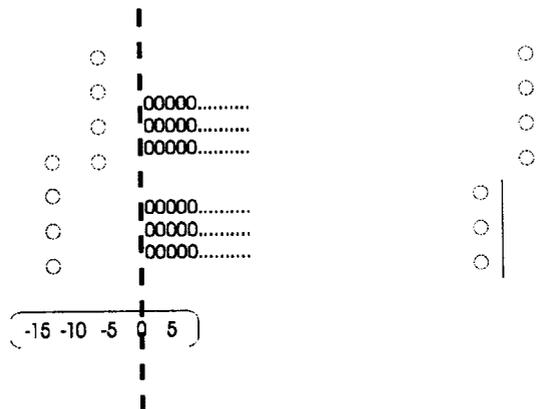
Front paper alignment

Printing starts at the arrow mark. The unprintable area is to the left of the arrow mark.



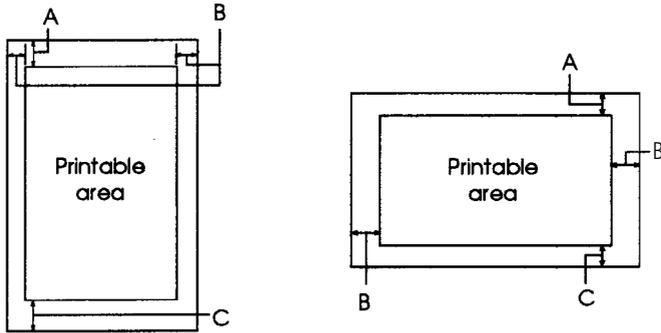
Rear paper alignment

Printing starts at "0" on the scale. The unprintable area is to the left of the "0".



Printable area

Single sheets, envelopes, and postcards:



A The minimum top margin is 4.2 mm.

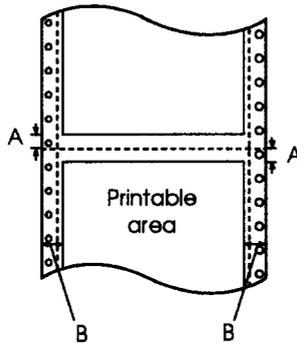
B The minimum left margin is 3.0 mm.

The minimum right margin is 3.0 mm.

For single sheets, the maximum printable width is 370 mm (14.5 inches).

C The minimum bottom margin is 4.2 mm.

Continuous paper:

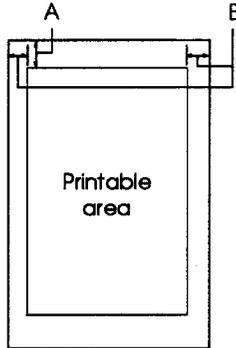


A The minimum top and bottom margins above and below the perforation are 4.2 mm.

B The minimum left and right margins are 13 mm (0.51 inch).

The maximum printable width is 345.2 mm (13.5 inches).

Roll paper:



A The minimum top margin is 4.2 mm.

B The minimum left margin is 3.0 mm.

The minimum right margin is 3.0 mm.

The maximum printable width is 203.2 mm (8 inches).

Mechanical

Paper-feed methods:	Friction feed (front and rear) Push tractor feed (front and rear) Push/pull tractor (with optional pull tractor C80032*, front, rear) Pull sprocket (front, rear, bottom) Cut-sheet feeder (option C80673*, C80674*)
Ribbon life:	12 million characters (Draft 10 cpi, at 14 dots /character)
Total print amount:	750 million lines
Print head life:	200 million characters/head
Dimensions:	639 mm (W) x 410 mm (D) x 257 mm (H)
Weight:	Approx. 13 kg

Electrical

120V model:

Rated voltage:	AC 120 V
Input voltage range:	AC 103.5 to 132 V
Rated frequency range:	50 to 60 Hz
Input frequency range:	49.5 to 60.5 Hz
Rated current:	1.0 A*
Power consumption:	Approx. 69 W (self test in draft mode, 10 cpi)
Insulation resistance:	10 MΩ min (between AC line and chassis, DC 500 V)
Dielectric strength:	AC 1000 Vrms. 1 min, or AC 1200 Vrms. 1 sec. (between AC line and chassis)

*Maximum 1.8 A depending on the character type.

230V model:

Rated voltage:	AC 220 to 240 V
Input voltage range:	AC 198 to 264 V
Rated frequency range:	50 to 60 Hz
Input frequency range:	49.5 to 60.5 Hz
Rated current:	0.5 A*
Power consumption:	Approx. 60 W (self test in draft mode, 10 cpi)

Insulation resistance: 10 M Ω min. (between AC line and chassis, DC 500 V)

Dielectric strength: AC 1500 Vrms. 1 min. (between AC line and chassis)

*Maximum 0.9 A depending on the character type.

Environmental

Temperature: 5 to 35°C (operating, *1)
15 to 25°C (operating *1, *2)
-30 to 60°C (storage)

Humidity: 10 to 80% RH (operating *1)
30 to 60% RH (operating, *1, *2)
0 to 85% RH (storage, *1)

Resistance to shock: 1 G, within 1 ms (operating, *3)
2 G, within 2 ms (storage, *3)

Resistance to vibration: 0.25 G, 55 Hz max. (operating)
0.50 G, 55 Hz max. (storage, *3)

*1: without condensation

*2: when printing multipart papers, envelopes, postcards. or labels

*3: in shipping container

Safety approvals

120 V model:

Safety standards: UL1950 with D3
CSA C22.2 950 with D3

EMI: FCC part 15 subpart B class B
CSA C108.8

230 V model:

Safety standards: EN 60950 (TÜV, SEMKO, DEMKO, NEMKO, FIMKO)

EMI: EN 55022 (CISPR pub.22) class B

Acoustic noise:

Level: Approx. 55 dB (A) (ISO 7779 pattern)

CE marking

230 V model:

Low Voltage Directive 73/23/EEC: EN60950

EMC Directive 89/336/EEC: EN55022 class B
EN50082-1
IEC801-2
IEC801-3
IEC801-4

**Non-Automatic Weighting
Instruments Directive 90/384/EEC:** EN45501

Interface specifications

The printer provides a bidirectional, 8-bit, parallel interface and Type-B optional interface slot as standard.

Parallel interface (forward channel)

- Transmission mode:** g-bit parallel, IEEE-P1284 compatibility mode
- Adaptable connector:** 57-30360 (Amphenol) or equivalent
- synchronization:** STROBE pulse
- Handshaking:** BUSY and ACKNLG signals
- Signal level:** TTL compatible (IEEE-P1284 level 1 device)

The following table lists the parallel connector pin assignments and describes their respective interface signals.

Pin no.	Signal name	GND	In/Out	Description
1	<u>STROBE</u>	19	In	Strobe pulse. Input data is latched at falling edge of the signal.
2	DATA1	20	In	Bit 0: LSB Parallel input data to the printer.
3	DATA2	21	In	Bit 1
4	DATA3	22	In	Bit 2
5	DATA4	23	In	Bit 3
6	DATA5	24	In	Bit 4
7	DATA6	25	In	Bit 5
8	DATA7	26	In	Bit 6
9	DATA8	27	In	Bit 7: MSB
10	<u>ACKNLG</u>	28	Out	This signal (negative pulse) indicates that the printer has received data and is ready to accept more.
11	BUSY	29	Out	A HIGH signal means that the printer is not ready to accept data.
12	PE	28	Out	A HIGH signal means the printer is out of paper.

Pin no.	Signal name	GND	In/Out	Description
13	SLCT	28	Out	Always HIGH when the printer is on.
14	$\overline{\text{AFXT}}$	30	In	Not used.
31	$\overline{\text{INIT}}$	30	In	Set LOW to initialize the printer.
32	$\overline{\text{ERROR}}$	29	Out	This signal is LOW when the printer is in an error state.
36	$\overline{\text{SLIN}}$	30	In	Not used.
18	Logic H	-	Out	This line is pulled up to +5V through 3.9 k Ω resistance.
35	+5V	-	Out	This line is pulled up to +5V through 3.3 k Ω resistance.
17	Chassis	-	-	Chassis GND.
16,33, 19-30	GND.	-	-	Signal GND.
15,34	NC	-	-	Not connected.

*In/Out shows the direction of signal flow as viewed from the printer.

Parallel interface (reverse channel)

Transmission mode: IEEE-P1284 nibble mode

Adaptable connector: 57-30360 (Amphenol) or equivalent

synchronization: Refer to the IEEE-P1284 specification

Handshaking: Refer to the IEEE-P1284 specification

Signal level: IEEE-P1284 level 1 device

Data transmission timing: Refer to the IEEE/P1284 specification

Extensibility request: The printer responds to the extensibility request in the affirmative when the request is 00H or 04H, which means:

00H: Request nibble mode of reverse channel transfer

04H: Request device ID in nibble mode of reverse channel transfer

The following table lists the parallel connector pin assignments and describes their respective interface signals.

Pin no.	Signal name	GND	In/Out	Description
1	HostClk	19	In	Strobe pulse. Input data is latched at falling edge of the signal.
2	DATA1	20	In	Bit 0: LSB Parallel input data to the printer.
3	DATA2	21	In	Bit 1
4	DATA3	22	In	Bit 2
5	DATA4	23	In	Bit 3
6	DATA5	24	In	Bit 4
7	DATA6	25	In	Bit 5
8	DATA7	26	In	Bit 6
9	DATA8	27	In	Bit 7: MSB
10	PtrClk	28	Out	Used to qualify data being sent to the host. Set LOW then HIGH to cause an interrupt indicating to host that data is available.
11	PtrBusy/ DataBit-3,7	29	Out	Data bits 3 then 7, indicate forward channel busy status.
12	ACkDataReq/ DataBit-2,6	28	Out	Data bits 2 then 6. Set HIGH until host requests data transfer, then follows nData Avail (nFault).
13	Xflag/ DataBit-1,5	28	Out	Data bits 1 then 5.

Pin no.	Signal name	GND	In/Out	Description
14	Host Busy	30	In	Set LOW to indicate that host can receive peripheral device to host data. Then set high to acknowledge receipt of that nibble. Set high in response to PtrClk (nAck) low pulse to m-enter reverse data transfer phase.
31	$\overline{\text{INIT}}$	30	In	Set LOW to initialize the winter.
32	$\overline{\text{DataAvail/}}/$ DataBit-0,4	29	<i>out</i>	This signal is LOW when the printer is in an error state.
36	1284-Active	30	In	Set HIGH during 1284 mode.
18	Logic H		out	This line is pulled up to +5V through 3.9 k Ω resistance.
35	+5V	-	O u t	This line is pulled up to +5V through 3.3 k Ω resistance.
17	Chassis	-	-	Chassis GND.
16, 33, 19-30	GND	-	-	Signal GND.
15 ,34	NC	-	-	Not connected.

- In/Out shows the direction of signal flow as viewed from the printer.

Using Commands

Sending printer commands

Most actions your printer performs are controlled by your software. Software commands instruct the printer to print in a particular typeface, feed the paper a certain amount after printing each line, start printing on a particular place on the page, and so on. The commands your printer recognizes are listed in this command summary.

Some software programs let you send these commands yourself. How you format commands depends on the software you are using. Some software programs accept only the decimal format, while others let you type in ASCII characters. (Some programs don't let you insert printer commands at all.) In addition, your software probably specifies certain punctuation you must use to enter the command. The software manual should explain the required format and punctuation.

Using the command summary

The following section lists and describes all the commands by topic. If a command has no parameters, it is merely listed. If it has parameters, they are explained. The parameters are indicated by lowercase italicized letters, usually *n*. The examples below show how the parameters are indicated.

ESC @ is a command with no parameters.

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

ESC K n1 n2 is a command with two parameters.

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

For further information about using printer commands, see the comprehensive *ESC/P Reference Manual* published by EPSON.

Commands Arranged by Topic

General operation

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC @	64	40	Initialize Printer
Esc U I/O	85	55	Turn Unidirectional Mode On/Off
ESC EM n	25	19	Control Paper Loading/Ejecting n = "1" Select bin 1 of CSF n = "2" Select bin 2 of CSF n = "R" Eject a sheet

Paper feeding

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
<i>CR</i>	13	0D	Carriage Return
FF	12	0C	Form Feed
LF	10	0A	Line Feed
ESC 0	48	30	Select 1 /8-inch Line Spacing
ESC 2	50	32	Select 1/6-inch Line Spacing
ESC 3 n	51	33	Set n/216-inch Line Spacing
<i>ESC + n</i>	43	2B	Set n/360-inch Line Spacing
ESC A n	65	41	Set n/72-inch Line Spacing

Page format

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC l n	108	6C	set Left Margin n = left margin column
ESC Q n	81	51	Set Right Margin n = right margin column
<i>ESC n</i>	67	43	Set Page Length in Lines n = number of lines
ESC C 0 n	67	43	Set Page Length in Inches n = number of inches
<i>ESC n</i>	78	4E	Set Bottom Margin for Continuous Paper n = number of lines
ESC O	79	4F	Cancel Bottom Margin for Continuous Paper

Print position motion

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC \$ n1 n2 36	24		Set Absolute Horizontal Print Position (1/60 inch fixed)
ESC \ n1 n2 92	5C		Set Relative Horizontal Print Position (1/120 inch fixed)
ESC D nm	68	44	Set Horizontal Tabs Up to 32 tabs entered in ascending order; terminated by 0
HT	9	09	Tab Horizontally
ESC B nm	66	42	Set Vertical Tabs Up to 16 tabs; last n should be 0
ESC J n	74	4A	Perform n/216-inch Line Feed

Font selection

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC k n	107	6B	Select Typeface n = 0: Roman 1: Sans Serif
ESC P	80	50	Select 10.5 point, 10 cpi
ESC M	77	4D	Select 10.5 point, 12 cpi
ESC g	103	67	Select 10.5 point, 15 cpi
ESC p l/0	112	70	Turn Proportional Mode On/Off
ESC x n	120	78	Select NLQ or Draft n=0: Draft 1:NLQ
ESC 4	52	34	Select Italic Font
ESC 5	53	35	Cancel Italic Font
ESC E	69	45	Select Bold Font
ESC F	70	46	Cancel Bold Font
ESC ! n	33	21	Master Select To find the value of n add together the numbers of the typestyles you want to combine from the list below: n=0: 10 cpi 16: double-strike 1: 12 cpi 32: double-width 2: prop. 64: italic 4: cond. 128: underline 8: bold

Font enhancement

<i>ASCII</i>	<i>Dec.</i>	<i>Hex</i>	<i>Description</i>
SI	15	0F	Select Condensed Printing
DC2	18	12	Cancel Condensed Printing
s o	14	0E	Select Double-Width Printing (one line)
ESC W I/O	87	57	Turn Double-Width Printing On/Off
DC4	20	14	Cancel-Width Printing (One line)
ESC-I/O	45	2D	Select Double-Width Printing (one Line)
ESC w I/O	87	57	Turn Double-Width Printing On/Off
ESC G	20	14	Cancel Double-Width Printing (one line)
ESC H	45	2D	Turn Underline On/Off
ESC S 0	119	77	Turn Double-Height Printing On/Off
ESC S 1	71	47	Select Double-Strike Printing
ESC T	72	48	Cancel Double-Strike Printing
	83	53	Select Superscript Printing
	83	53	Select Subscript Printing
	84	54	Cancel Superscript/Subscript Printing

Character handling

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC: 0 n 0	58	3A	Copy ROM to RAM n= 0, 1 n: Typeface
ESC R n	82	52	Select an International Char. Set n = 0: USA 8: Japan 1: France 9: Norway 2: Germany 10: Den. II 3: UK 11: Spain II 4: Denmark 12: L. Amer. 5: Sweden 6: Italy 7: Spain
ESC & n	38	26	Define User-Defined Character
ESC % n	37	25	Select User-Defined Set n = 0: Normal set 1: Userdefined set
ESC t n	116	74	Select Character Table Select character table n assigned by ESC (t n = 0, 1, 48, or 49 only n = 2: Remaps downloaded characters from 0-127 to 128-255
ESC 6	54	36	Enable Printing of Upper Control Codes With graphics character tables this command enables the printing of codes 128-159
ESC 7	55	37	Enable Upper Control Codes Cancels ESC 6

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC (t nn)	40 116 28 74		Assign Character Table ESC (t 30 dl d2 d3 Assign Character Table set by d2 and d3 to dl dl = 0, 1, 2, 3, "0", "1", "2", or "3"
		<i>d2</i>	<i>d3</i>
		0	0
		1	0
		1	10
		24	0
		3	0
		A	10
		5	0
		6	0
		B	0
		7	0
		18	0
		8	0
		9	0
		E	0
		E	20
		F	0
		19	0
		1A	0
		7F	1
		1F	0
		7F	2
		1D	7
		1B	0
		1C	0
		20	0
		25	0
		23	0

*Available in certain areas.

Spacing

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC SP n	32	20	Set Intercharacter Space <i>n</i> = number of units of space added to the space between characters Units are 1/120 inch (draft) and 1 /180 inch (NLQ and proportional)

Bit image

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC K n1 n2	75	4B	Select Single-Density Graphics Mode
ESC L n1 n2	76	4C	Select Double-Density Graphics Mode
ESC Y n1 n2	89	59	Select High-Speed Double-Density Graphics Mode
<i>ESC Z n1 n2</i>	90	5 A	Select Quadruple-Density Graphics Mode
ESC* m n1 n2	42	2 A	Select Graphics Mode
<i>ESC ^ m n1 n2</i>	94	5 E	Select 9-Pin Graphics Mode

Barcode

<i>ASCII</i>	<i>Dec.</i>	<i>Hex.</i>	<i>Description</i>
ESC (B mn	40 66	28 42	Select Barcode Printing <i>ESC (B n1 n2 k m s v1 v2 c data</i> <i>n = (n1 + (256 × n2))</i> k: Select Barcode k=0: EAN - 13 1: EAN - 8 2: Interleaved 2 of 5 3: UPC-A 4: UPC-E 5: Code39 6: Code 128 7: POSTNET <i>m: Module width (120 dpi)</i> <i>m = 2: 2 dots</i> 3: 3 dots 4: 4 dots 5: 5 dots s: Space adjustment value <i>-3 ≤ s ≤ 3 (1/240 inch units)</i> v1, v2: Bar length v1 + v2 × 256 (1/72-inch) <input type="checkbox"/> The v1 and v2 values are ignored when POSTNET is selected. <input type="checkbox"/> The long bar length of POSTNET is always 0.125 inch; the short bar length is always 0.050 inch.

c: Control flag

Bit 0 = Check digit

0: A check digit is not added by the printer

1: A check digit is added by the printer

Bit 1 = Human readable character (HRC)

0: The HRC is added by the printer

1: The HRC is not added by the printer

Bit 2 = Position of flag character (for EAN-13 and UPC-A only)

0: Center

1: Under

Bits 3-7 = Not used

Barcode data

Barcode data corresponds to the barcode symbology. The data number of each barcode type is constant. The barcode is not printed if the following valid characters are not set.

Barcode Type	Number of valid characters 1 (HEX)	Number of valid characters 2 (HEX)
EAN-13	0D	0C
EAN-8	8	7
Interleaved 2 of 5	2 to FF	2 to FF
UPC-A	0C	0B
UPC-E	0C or 8	0B or 7
Code 39	1 to FF	1 to FF
Code 128	2 to FF	2 to FF
POSTNET	6 or 0A or 0C	5 or 9 or 0B

Number of valid characters 1: Control flag c b0=0

Number of valid characters 2: Control flag c b0=1

The valid data of each barcode type is described below. If invalid data is included in the barcode data string the barcode is not printed.

Barcode Type	Barcode Data
EAN13	0-9 (Hex 30-39)
EAN-8	0-9 (Hex 30-39)
UPC-A	0-9 (Hex 30-39)
UPC-E	0&9 (Hex 30-39)
Interleaved 2 of 5	0-9 (Hex 30-39)
POSTNET	C-9 (Hex 30-39)
Code 39	C-9 (Hex 30-39). (Hex 41-5A), (Hex 20, 24, 25, 2B, 2D, 2E, 2F)
Code 128	Set A, Set B, Set C

The following conditions are required for barcode printing.

- Barcode printing is always performed unidirectionally. However, when it is mixed with raster bit image data, neither barcode nor raster bit image is printed.**
- A barcode is not printed when part of the barcode extends beyond the right margin.**
- When barcode data and text data are mixed in a data sequence, barcode and text are printed in the same place.**
- The initial data of Code 128 (Set A, B, or C) is identified as the first data of Code 128, and must be hexadecimal (41, 42, and 43 respectively).**
- When Code 128 Set C and Interleaved 2 of 5 are selected, barcode data requires an even number data string. However, if an odd number string is sent, a 0 is automatically added, making it an even number data string.**
- The barcode print start position is always 7/72 inch above the baseline.**

Character Tables

International Character Sets

Country	ASCII code hex											
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
USA	#	\$	@	[	\	\]	^	'	{	|	}	~
France	#	\$	à	°	ç	§	^	'	é	ù	è	~
Germany	#	\$	§	Å	Ö	Ü	^	'	ä	ö	ü	ß
UK	£	\$	@	[	\	\]	^	'	{	|	}	~
Denmark	#	\$	@	Æ	Ø	Å	^	'	æ	ø	å	~
Sweden	#	¤	É	Å	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì
Spain	¤	\$	@	í	Ñ	¿	^	'	ñ	}	~	

Graphics Character Tables

PC 437 (United States)

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		0	@	P	`	p	Ç	É	á	⌘	⌘	⌘	⌘	⌘	⌘
1		!	1	A	Q	a	q	ú	æ	í	⌘	⌘	⌘	⌘	⌘	⌘
2		DC2	2	B	R	b	r	é	Æ	ó	⌘	⌘	⌘	⌘	⌘	⌘
3		#	3	C	S	c	s	â	ø	ú	⌘	⌘	⌘	⌘	⌘	⌘
4		DC4	4	D	T	d	t	ä	ö	ñ	⌘	⌘	⌘	⌘	⌘	⌘
5		§	5	E	U	e	u	à	ò	Ñ	⌘	⌘	⌘	⌘	⌘	⌘
6		&	6	F	V	f	v	â	ù	â	⌘	⌘	⌘	⌘	⌘	⌘
7		'	7	G	W	g	w	ç	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
8		(	8	H	X	h	x	è	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
9	HT	EM	)	9	I	Y	i	y	è	ÿ	¿	⌘	⌘	⌘	⌘	⌘
A	LF	*	:	J	Z	j	z	é	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
B	VT	ESC	+	<	K	[	k	í	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
C	FF		,	<	L	\	l	í	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
D	CR		=	M	]	]	m	í	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
E	SO	.	>	N	^	^	n	í	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘
F	SI	/	?	O	_	_	o	í	ÿ	¿	⌘	⌘	⌘	⌘	⌘	⌘

PC850

PC 860

CODE	8	9	A	B	C	D	E	F
0	Ç	É	Á	⋮	⋮	Ð	Ó	±
1	Ù	Æ	Í	⋮	⋮	Ð	Ó	±
2	É	Æ	Ó	⋮	⋮	Ð	Ó	±
3	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
4	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
5	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
6	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
7	Ç	É	Á	⋮	⋮	Ð	Ó	±
8	È	É	Á	⋮	⋮	Ð	Ó	±
9	È	É	Á	⋮	⋮	Ð	Ó	±
A	È	É	Á	⋮	⋮	Ð	Ó	±
B	È	É	Á	⋮	⋮	Ð	Ó	±
C	È	É	Á	⋮	⋮	Ð	Ó	±
D	È	É	Á	⋮	⋮	Ð	Ó	±
E	È	É	Á	⋮	⋮	Ð	Ó	±
F	È	É	Á	⋮	⋮	Ð	Ó	±

CODE	8	9	A	B	C	D	E	F
0	Ç	É	Á	⋮	⋮	Ð	Ó	±
1	Ù	Æ	Í	⋮	⋮	Ð	Ó	±
2	É	Æ	Ó	⋮	⋮	Ð	Ó	±
3	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
4	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
5	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
6	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
7	Ç	É	Á	⋮	⋮	Ð	Ó	±
8	È	É	Á	⋮	⋮	Ð	Ó	±
9	È	É	Á	⋮	⋮	Ð	Ó	±
A	È	É	Á	⋮	⋮	Ð	Ó	±
B	È	É	Á	⋮	⋮	Ð	Ó	±
C	È	É	Á	⋮	⋮	Ð	Ó	±
D	È	É	Á	⋮	⋮	Ð	Ó	±
E	È	É	Á	⋮	⋮	Ð	Ó	±
F	È	É	Á	⋮	⋮	Ð	Ó	±

PC 863

PC 865

CODE	8	9	A	B	C	D	E	F
0	Ç	É	Á	⋮	⋮	Ð	Ó	±
1	Ù	Æ	Í	⋮	⋮	Ð	Ó	±
2	É	Æ	Ó	⋮	⋮	Ð	Ó	±
3	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
4	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
5	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
6	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
7	Ç	É	Á	⋮	⋮	Ð	Ó	±
8	È	É	Á	⋮	⋮	Ð	Ó	±
9	È	É	Á	⋮	⋮	Ð	Ó	±
A	È	É	Á	⋮	⋮	Ð	Ó	±
B	È	É	Á	⋮	⋮	Ð	Ó	±
C	È	É	Á	⋮	⋮	Ð	Ó	±
D	È	É	Á	⋮	⋮	Ð	Ó	±
E	È	É	Á	⋮	⋮	Ð	Ó	±
F	È	É	Á	⋮	⋮	Ð	Ó	±

CODE	8	9	A	B	C	D	E	F
0	Ç	É	Á	⋮	⋮	Ð	Ó	±
1	Ù	Æ	Í	⋮	⋮	Ð	Ó	±
2	É	Æ	Ó	⋮	⋮	Ð	Ó	±
3	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
4	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
5	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
6	Á	Æ	Ó	⋮	⋮	Ð	Ó	±
7	Ç	É	Á	⋮	⋮	Ð	Ó	±
8	È	É	Á	⋮	⋮	Ð	Ó	±
9	È	É	Á	⋮	⋮	Ð	Ó	±
A	È	É	Á	⋮	⋮	Ð	Ó	±
B	È	É	Á	⋮	⋮	Ð	Ó	±
C	È	É	Á	⋮	⋮	Ð	Ó	±
D	È	É	Á	⋮	⋮	Ð	Ó	±
E	È	É	Á	⋮	⋮	Ð	Ó	±
F	È	É	Á	⋮	⋮	Ð	Ó	±

CODE	8	9	A	B	C	D	E	F
0	Ç	È	Á	⋮	⋮	α	±	≡
1	Ü	Æ	Í	⋮	⋮	β	±	±
2	É	Æ	Ó	⋮	⋮	Γ	±	±
3	À	Ö	Ú	⋮	⋮	Π	±	±
4	À	Ö	Á	⋮	⋮	Σ	±	±
5	À	Ö	Í	⋮	⋮	σ	±	±
6	À	Ö	Ú	⋮	⋮	μ	+	±
7	Ç	È	Û	⋮	⋮	τ	±	±
8	È	Û	Û	⋮	⋮	θ	±	±
9	È	Û	Û	⋮	⋮	θ	±	±
A	È	Û	Û	⋮	⋮	Ω	±	±
B	È	Û	Û	⋮	⋮	Ω	±	±
C	È	Û	Û	⋮	⋮	Ω	±	±
D	È	Û	Û	⋮	⋮	Ω	±	±
E	È	Û	Û	⋮	⋮	Ω	±	±
F	È	Û	Û	⋮	⋮	Ω	±	±

CODE	8	9	A	B	C	D	E	F	
0	NUL				·	À	Ð	à	ð
1					±	Á	Ñ	á	ñ
2		DC2	ç	±	·	Â	Ò	â	ò
3			£	±	·	Ã	Ó	ã	ó
4		DC4	£	±	·	Ä	Ô	ä	ô
5			¥	±	·	Å	Ö	å	ö
6			¥	±	·	Æ	Ø	æ	ø
7			¥	±	·	Ç	×	ç	÷
8			¥	±	·	È	Ø	è	ø
9	HT	EM	è	±	·	É	Ù	é	ù
A	LF		è	±	·	Ê	Ú	ê	ú
B	VT	ESC	è	±	·	Ë	Û	ë	û
C			è	±	·	Ì	Ü	ì	ü
D			è	±	·	Í	Ý	í	ý
E			è	±	·	Î	Þ	î	þ
F			è	±	·	Ï	ß	ï	ÿ

Abkomp

ISO Latin 1

CODE	8	9	A	B	C	D	E	F
0	NUL		Ò	·	ò			
1			À	·	à	Ó		
2		DC2	À	·	á	Ö		
3			À	·	â	Ø		
4		DC4	À	·	ã	Ö		
5			À	·	ä	æ		
6			Ç	·	é	ù		
7			È	·	é	ú		
8			È	·	ê	û		
9	HT	EM	È	·	ë	ü		
A	LF		È	·	ÿ			
B	VT	ESC	Ì	·	í	β		
C			Ì	·	î	Ω		
D			Ì	·	ï	Ω		
E			Ì	·	ì	¿		
F			Ì	·	ñ	±	DEL	

CODE	8	9	A	B	C	D	E	F	
0					·	À	Ð	à	ð
1					±	Á	Ñ	á	ñ
2			ç	±	·	Â	Ò	â	ò
3			£	±	·	Ã	Ó	ã	ó
4			£	±	·	Ä	Ô	ä	ô
5			¥	±	·	Å	Ö	å	ö
6			¥	±	·	Æ	Ø	æ	ø
7			¥	±	·	Ç	×	ç	÷
8			¥	±	·	È	Ø	è	ø
9			è	±	·	É	Ù	é	ù
A			è	±	·	Ê	Ú	ê	ú
B			è	±	·	Ë	Û	ë	û
C			è	±	·	Ì	Ü	ì	ü
D			è	±	·	Í	Ý	í	ý
E			è	±	·	Î	Þ	î	þ
F			è	±	·	Ï	ß	ï	ÿ

Roman 8

HexCode	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	'	p								Ɔ
1		!	"	1	A	Q	a	q			À	—	â	À	Á	Ɔ
2		!	"	2	B	R	b	r			Á	ÿ	ê	Á	À	Ɔ
3		!	"	3	C	S	c	s			Â	°	ó	Â	Á	Ɔ
4		!	"	4	D	T	d	t			Ë	°	á	Ë	À	Ɔ
5		!	"	5	E	U	e	u			È	°	é	È	Á	Ɔ
6		!	"	6	F	V	f	v			Ë	°	ê	Ë	À	Ɔ
7		!	"	7	G	W	g	w			Ì	°	ú	Ì	Á	Ɔ
8		!	"	8	H	X	h	x			Í	°	à	Í	À	Ɔ
9		!	"	9	I	Y	i	y			Î	°	è	Î	Á	Ɔ
A		!	"		:	J	:	j			Ï	°	ò	Ï	À	Ɔ
B		!	"		;	K	;	k			Ï	°	ù	Ï	Á	Ɔ
C		!	"		<	L	<	l			Ï	°	ä	Ï	À	Ɔ
D		!	"		=	M	=	m			Ï	°	ë	Ï	Á	Ɔ
E		!	"		>	N	>	n			Ï	°	ö	Ï	À	Ɔ
F		!	"		?	O	?	o			Ï	°	ü	Ï	Á	Ɔ

PC 437 Greek

PC 852

CODE	8	9	A	B	C	D	E	F
0	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
1	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
2	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
3	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
4	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
5	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
6	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
7	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
8	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
9	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
A	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
B	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
C	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
D	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
E	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ
F	Α	Β	Γ	Δ	Ε	Ζ	Η	Θ

CODE	8	9	A	B	C	D	E	F
0	α	β	γ	δ	ε	ζ	η	θ
1	α	β	γ	δ	ε	ζ	η	θ
2	α	β	γ	δ	ε	ζ	η	θ
3	α	β	γ	δ	ε	ζ	η	θ
4	α	β	γ	δ	ε	ζ	η	θ
5	α	β	γ	δ	ε	ζ	η	θ
6	α	β	γ	δ	ε	ζ	η	θ
7	α	β	γ	δ	ε	ζ	η	θ
8	α	β	γ	δ	ε	ζ	η	θ
9	α	β	γ	δ	ε	ζ	η	θ
A	α	β	γ	δ	ε	ζ	η	θ
B	α	β	γ	δ	ε	ζ	η	θ
C	α	β	γ	δ	ε	ζ	η	θ
D	α	β	γ	δ	ε	ζ	η	θ
E	α	β	γ	δ	ε	ζ	η	θ
F	α	β	γ	δ	ε	ζ	η	θ

PC 853

CODE	8	9	A	B	C	D	E	F
0	Ç	É	Á	⌘	⌘	Ó	-	
1	Ü	É	Í	⌘	⌘	Ó	±	
2	É	Ó	Ó	⌘	⌘	Ó	±	
3	É	Ó	Ó	⌘	⌘	Ó	±	
4	À	À	À	⌘	⌘	Ó	±	
5	À	À	À	⌘	⌘	Ó	±	
6	À	À	À	⌘	⌘	Ó	±	
7	Ç	È	Ì	⌘	⌘	Ó	±	
8	È	È	È	⌘	⌘	Ó	±	
9	È	È	È	⌘	⌘	Ó	±	
A	È	È	È	⌘	⌘	Ó	±	
B	È	È	È	⌘	⌘	Ó	±	
C	È	È	È	⌘	⌘	Ó	±	
D	È	È	È	⌘	⌘	Ó	±	
E	È	È	È	⌘	⌘	Ó	±	
F	È	È	È	⌘	⌘	Ó	±	

PC 855

CODE	8	9	A	B	C	D	E	F
0	Ń	Ń	Ń	⌘	⌘	Ń	Ń	-
1	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
2	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
3	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
4	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
5	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
6	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
7	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
8	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
9	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
A	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
B	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
C	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
D	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
E	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń
F	Ń	Ń	Ń	⌘	⌘	Ń	Ń	Ń

PC 857

CODE	8	9	A	B	C	D	E	F
0	Ç	É	Á	⌘	⌘	Ó	-	
1	Ü	É	Í	⌘	⌘	Ó	±	
2	É	Ó	Ó	⌘	⌘	Ó	±	
3	É	Ó	Ó	⌘	⌘	Ó	±	
4	À	À	À	⌘	⌘	Ó	±	
5	À	À	À	⌘	⌘	Ó	±	
6	À	À	À	⌘	⌘	Ó	±	
7	Ç	È	Ì	⌘	⌘	Ó	±	
8	È	È	È	⌘	⌘	Ó	±	
9	È	È	È	⌘	⌘	Ó	±	
A	È	È	È	⌘	⌘	Ó	±	
B	È	È	È	⌘	⌘	Ó	±	
C	È	È	È	⌘	⌘	Ó	±	
D	È	È	È	⌘	⌘	Ó	±	
E	È	È	È	⌘	⌘	Ó	±	
F	È	È	È	⌘	⌘	Ó	±	

PC 864

CODE	8	9	A	B	C	D	E	F
0	•	•	•	•	•	•	•	•
1	•	•	•	•	•	•	•	•
2	•	•	•	•	•	•	•	•
3	•	•	•	•	•	•	•	•
4	•	•	•	•	•	•	•	•
5	•	•	•	•	•	•	•	•
6	•	•	•	•	•	•	•	•
7	•	•	•	•	•	•	•	•
8	•	•	•	•	•	•	•	•
9	•	•	•	•	•	•	•	•
A	•	•	•	•	•	•	•	•
B	•	•	•	•	•	•	•	•
C	•	•	•	•	•	•	•	•
D	•	•	•	•	•	•	•	•
E	•	•	•	•	•	•	•	•
F	•	•	•	•	•	•	•	•

CODE	8	9	A	B	C	D	E	F
0	А	Р	а	б	л	л	р	ё
1	Б	С	б	в	л	т	с	ё
2	В	Т	в	г	т	т	т	ё
3	Г	У	г	д	т	у	с	ё
4	Д	Ф	д	е	т	ф	с	ё
5	Е	Х	е	ж	т	х	с	ё
6	Ж	Ц	ж	з	т	ц	с	ё
7	З	Ч	з	и	т	ч	с	ё
8	И	Ш	и	ь	т	ш	с	ё
9	ь	ш	ь	ь	т	ш	с	ё

CODE	8	9	A	B	C	D	E	F
0		Т	И	И	Л	Т	З	-
1		И	И	И	Л	У	η	±
2		У	О	У	Т	Ф	θ	υ
3			У	А	Т	Х	ι	φ
4			В	К	П	Ω	κ	χ
5		У	В	Λ	Π	α	λ	ς
6	А	У	Г	М	Р	β	μ	ψ
7		е	Δ	Ν	Е	γ	ν	·
8		η	Ε	Ξ	Υ	δ	ξ	·
9		·	Ζ	Ψ	Ω	ε	ο	·

ISO Latin 1T

ISO 8859-7

CODE	8	9	A	B	C	D	E	F
0			·	À	À	à	ġ	
1			±	Á	Á	á	ñ	
2			²	Â	Â	â	ò	
3		£	³	Ã	Ã	ã	ó	
4			µ	Ä	Ä	ä	õ	
5			¶	Å	Å	å	ö	
6			§	Æ	Æ	æ	ø	
7			§	Ç	Ç	ç	÷	
8			§	È	È	è	ø	
9			§	É	É	é	ù	
A			§	Ê	Ê	ê	ú	
B			§	Ë	Ë	ë	û	
C			§	Ì	Ì	ì	ü	
D			§	Í	Í	í	ý	
E			§	Î	Î	î	ÿ	
F			§	Ï	Ï	ï	ÿ	

CODE	8	9	A	B	C	D	E	F
0			·	Ï	Π	Û	π	
1			·	±	Α	Ρ	α	ρ
2			·	²	Β	Σ	β	ς
3		£	³	³	Γ	Τ	γ	τ
4			µ	µ	Δ	Υ	δ	υ
5			¶	¶	Ε	Φ	ε	φ
6			§	§	Ζ	Χ	ζ	χ
7			§	§	Η	Θ	η	θ
8			§	§	Θ	Ψ	θ	ψ
9			§	§	Ι	Ω	ι	ω
A			§	§	Κ	Ϊ	κ	ϊ
B			§	§	Λ	Υ	λ	υ
C			§	§	Μ	ά	μ	ά
D			§	§	Ν	έ	ν	έ
E			§	§	Ξ	ή	ξ	ή
F			§	§	Ο	ί	ο	ί

MAZOWIA

Code MJK

CODE	8	9	A	B	C	D	E	F
0	Ç	Û	2	⋮	L	⊥	α	≡
1	Û	Ë	2	⋮	L	⊥	β	±
2	é	Ë	ó	⋮	⊥	⊥	γ	≡
3	á	í	ó	⋮	⊥	⊥	π	≡
4	ä	ö	ó	⋮	⊥	⊥	σ	≡
5	ä	ö	ó	⋮	⊥	⊥	μ	⊥
6	ä	ö	ó	⋮	⊥	⊥	τ	+
7	ä	ö	ó	⋮	⊥	⊥	θ	·
8	ä	ö	ó	⋮	⊥	⊥	ϑ	·
9	ä	ö	ó	⋮	⊥	⊥	ϑ	·
A	ä	ö	ó	⋮	⊥	⊥	ϑ	·
B	ä	ö	ó	⋮	⊥	⊥	ϑ	·
C	ä	ö	ó	⋮	⊥	⊥	ϑ	·
D	ä	ö	ó	⋮	⊥	⊥	ϑ	·
E	ä	ö	ó	⋮	⊥	⊥	ϑ	·
F	ä	ö	ó	⋮	⊥	⊥	ϑ	·

CODE	8	9	A	B	C	D	E	F
0	Ç	Û	2	⋮	L	⊥	α	≡
1	Û	Ë	2	⋮	⊥	⊥	β	±
2	é	Ë	ó	⋮	⊥	⊥	γ	≡
3	á	í	ó	⋮	⊥	⊥	π	≡
4	ä	ö	ó	⋮	⊥	⊥	σ	≡
5	ä	ö	ó	⋮	⊥	⊥	μ	⊥
6	ä	ö	ó	⋮	⊥	⊥	τ	+
7	ä	ö	ó	⋮	⊥	⊥	θ	·
8	ä	ö	ó	⋮	⊥	⊥	ϑ	·
9	ä	ö	ó	⋮	⊥	⊥	ϑ	·
A	ä	ö	ó	⋮	⊥	⊥	ϑ	·
B	ä	ö	ó	⋮	⊥	⊥	ϑ	·
C	ä	ö	ó	⋮	⊥	⊥	ϑ	·
D	ä	ö	ó	⋮	⊥	⊥	ϑ	·
E	ä	ö	ó	⋮	⊥	⊥	ϑ	·
F	ä	ö	ó	⋮	⊥	⊥	ϑ	·

Bulgaria

Estonia

CODE	8	9	A	B	C	D	E	F
0	А	Р	а	р	L	⋮	α	≡
1	Б	С	б	с	⊥	⋮	β	±
2	В	Т	в	т	⊥	⋮	γ	≡
3	Г	У	г	у	⊥	⋮	π	≡
4	Д	Ф	д	ф	⊥	⋮	σ	≡
5	Е	Х	е	х	⊥	⋮	μ	⊥
6	Ж	Ц	ж	ц	⊥	⋮	τ	+
7	З	Ч	з	ч	⊥	⋮	θ	·
8	И	Ш	и	ш	⊥	⋮	ϑ	·
9	Й	Щ	й	щ	⊥	⋮	ϑ	·
A	К	Ъ	к	ъ	⊥	⋮	ϑ	·
B	Л	Ь	л	ь	⊥	⋮	ϑ	·
C	М	Н	м	н	⊥	⋮	ϑ	·
D	Н	Э	н	э	⊥	⋮	ϑ	·
E	О	Ю	о	ю	⊥	⋮	ϑ	·
F	П	Я	п	я	⊥	⋮	ϑ	·

CODE	8	9	A	B	C	D	E	F
0	Ç	Û	2	⋮	L	⊥	α	≡
1	Û	Ë	2	⋮	⊥	⊥	β	±
2	é	Ë	ó	⋮	⊥	⊥	γ	≡
3	á	í	ó	⋮	⊥	⊥	π	≡
4	ä	ö	ó	⋮	⊥	⊥	σ	≡
5	ä	ö	ó	⋮	⊥	⊥	μ	⊥
6	ä	ö	ó	⋮	⊥	⊥	τ	+
7	ä	ö	ó	⋮	⊥	⊥	θ	·
8	ä	ö	ó	⋮	⊥	⊥	ϑ	·
9	ä	ö	ó	⋮	⊥	⊥	ϑ	·
A	ä	ö	ó	⋮	⊥	⊥	ϑ	·
B	ä	ö	ó	⋮	⊥	⊥	ϑ	·
C	ä	ö	ó	⋮	⊥	⊥	ϑ	·
D	ä	ö	ó	⋮	⊥	⊥	ϑ	·
E	ä	ö	ó	⋮	⊥	⊥	ϑ	·
F	ä	ö	ó	⋮	⊥	⊥	ϑ	·

CODE	8	9	A	B	C	D	E	F
0	Ç	É	á	·	L	á	α	≡
1	Ü	æ	í	·	l	ç	β	±
2	Ë	Æ	ó	·	l	e	Γ	≥
3	é	æ	ó	·	l	e	π	κ
4	â	ò	ñ	·	l	e	Σ	η
5	à	ò	ñ	·	l	e	σ	μ
6	â	ò	ñ	·	l	e	τ	±
7	ç	ë	ü	·	l	e	θ	±
8	ë	ë	ü	·	l	e	φ	±
9	è	è	ü	·	l	e	Ω	±
A	è	è	ü	·	l	e	δ	±
B	è	è	ü	·	l	e	ø	±
C	è	è	ü	·	l	e	ø	±
D	è	è	ü	·	l	e	ø	±
E	è	è	ü	·	l	e	ø	±
F	è	è	ü	·	l	e	ø	±

CODE	8	9	A	B	C	D	E	F
0					·	Á	Ð	f
1			·	á	Á	Ñ	á	ñ
2			·	á	Á	Ñ	á	ñ
3			·	á	Á	Ñ	á	ñ
4			·	á	Á	Ñ	á	ñ
5			·	á	Á	Ñ	á	ñ
6			·	á	Á	Ñ	á	ñ
7			·	á	Á	Ñ	á	ñ
8			·	á	Á	Ñ	á	ñ
9			·	á	Á	Ñ	á	ñ
A			·	á	Á	Ñ	á	ñ
B			·	á	Á	Ñ	á	ñ
C			·	á	Á	Ñ	á	ñ
D			·	á	Á	Ñ	á	ñ
E			·	á	Á	Ñ	á	ñ
F			·	á	Á	Ñ	á	ñ

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CODE	8	9	A	B	C	D	E	F
0	À	Á	à	·	L	á	р	È
1	À	Á	à	·	l	ç	р	è
2	À	Á	à	·	l	ç	р	è
3	À	Á	à	·	l	ç	р	è
4	À	Á	à	·	l	ç	р	è
5	À	Á	à	·	l	ç	р	è
6	À	Á	à	·	l	ç	р	è
7	À	Á	à	·	l	ç	р	è
8	À	Á	à	·	l	ç	р	è
9	À	Á	à	·	l	ç	р	è
A	À	Á	à	·	l	ç	р	è
B	À	Á	à	·	l	ç	р	è
C	À	Á	à	·	l	ç	р	è
D	À	Á	à	·	l	ç	р	è
E	À	Á	à	·	l	ç	р	è
F	À	Á	à	·	l	ç	р	è

CODE	8	9	A	B	C	D	E	F
0	NUL		0	@	P	`	p	
1			!	1	A	Q	a	q
2	DC2	"	2	B	R	b	r	
3		#	3	C	S	c	s	
4	DC4	\$	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	HT	EM)	9	I	Y	i	y
A	LF		*	:	J	Z	j	z
B	VT	ESC	+	;	K	[k	{
C	FF		,	=	L	\	l	
D	CR		-	<	M]	m	~
E	SO		.	>	N	^	n	
F	SI	/	?	O	_	~	o	

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