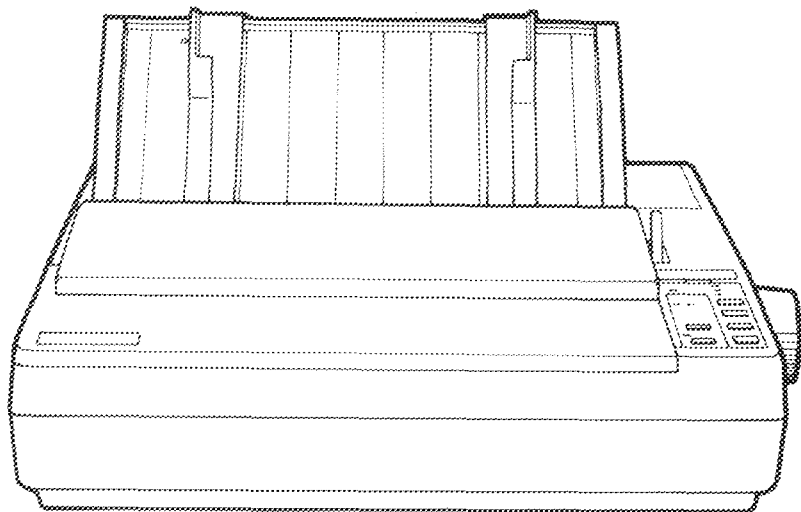
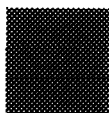


EPSON[®] *ActionPrinter™* 4000

User's
Manual



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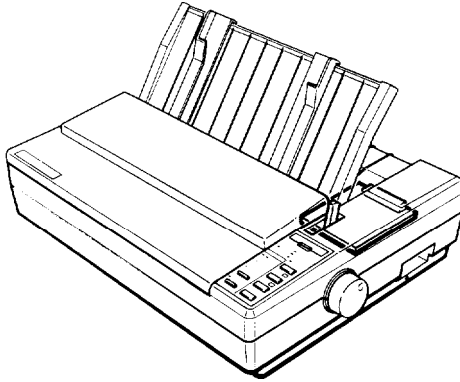


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- **Interface Boards**

Optional interface boards are available to supplement the printer's built-in parallel interface. Guidelines for choosing the right interface and instructions on installing the boards are given in Chapter 5.



About This Manual

This user's manual provides fully illustrated, step-by-step instructions on setting up and operating your Epson printer.

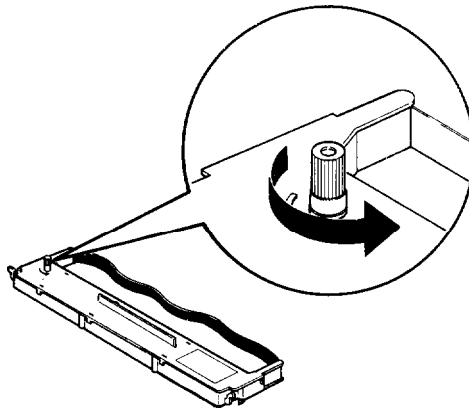
Finding your way around

- Chapter 1 contains information on unpacking, setting up, testing, and connecting the printer. Be sure to read and follow these instructions first. Inside the back flap of this manual are illustrations of the printer in which all of the major parts are identified.
- Chapters 2 and 3 cover paper handling and general printer operation. This important information is necessary for the day-to-day operation of your printer.

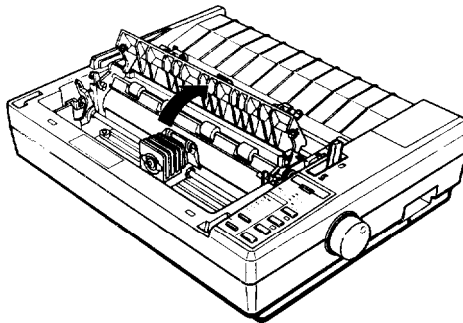


CAUTION: Never move the print head while the printer is turned on because this can damage the printer. Also, if you have been using the printer, the print head may be hot; let it cool for a few minutes before touching it.

2. Turn the ribbon-tightening knob in the direction of the arrow. This removes slack in the ribbon and makes it easier to install.



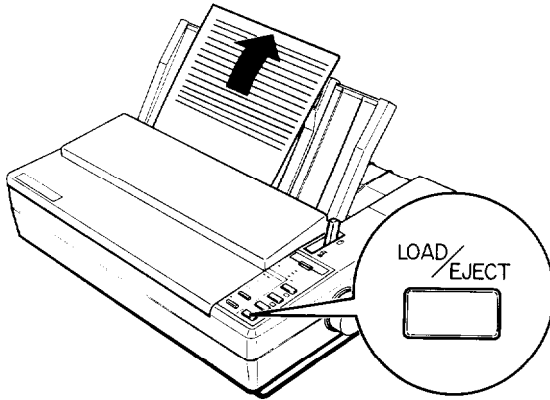
3. Open the paper tension unit cover.



- If the test results are satisfactory and you wish to stop the test, press the **ON LINE** button. If the test results are not satisfactory, see *Checking the Operation* later in this chapter for possible causes and solutions.

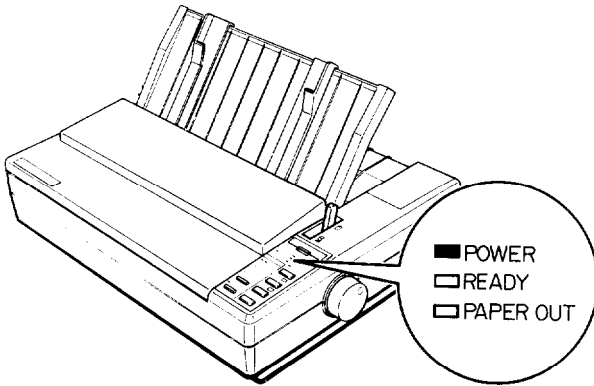
Note: To resume the test, press the **ON LINE** button once more.

- If the paper is still loaded, press the **LOAD/EJECT** button or **LINE FEED** button to eject it. Then turn off the printer.



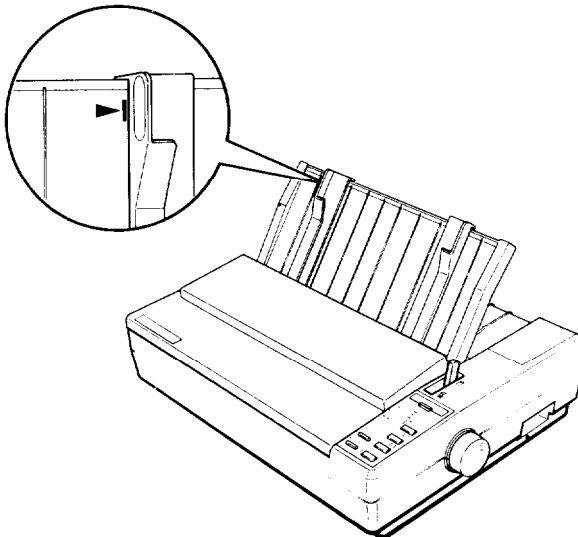
WARNING: After turning the power off, always wait at least five seconds before turning it back on. Turning the power on and off rapidly can damage the printer.

2. Turn on the printer. (The green **POWER** light should come on.)



Note: Do not insert paper in the printer before turning on the printer.

3. Move the left edge guide so that it locks in place next to the guide mark. (You may want to change this position later, depending on the margin settings of your application program.)



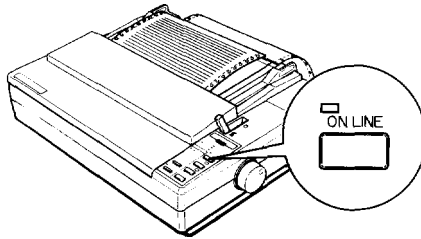
Switching Between Continuous and Single Sheets

Even with continuous paper loaded in the printer, the SmartPark feature allows you to easily switch to single-sheet printing without removing the continuous paper from the tractor.

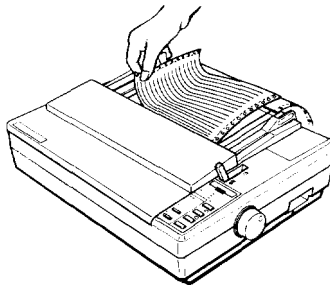
Switching to Single Sheets

To switch from continuous paper to single sheets, follow the steps below.

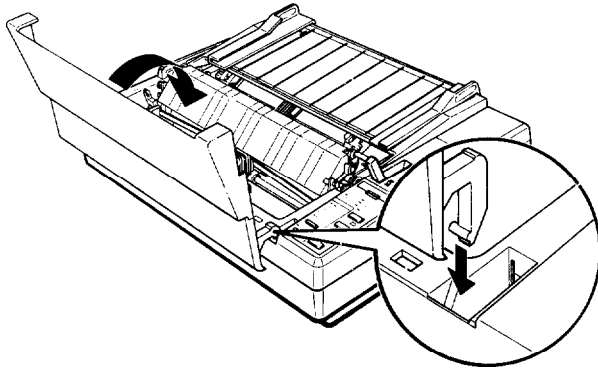
1. If the printer is on line, press the **ON LINE** button to set the printer off line.



2. Tear off any outgoing sheets. If the paper has advanced past the print head, you need to press the **FORM FEED** button to advance your document to a point where it can be easily removed.



4. Reattach the printer cover as shown below.



To help you check the position of the paper thickness lever, the orange MULTI - PART light on the control panel comes on if the lever is set to position 4 or higher.



WARNING: Always return the lever to position 2 when you go back to printing on ordinary paper. Continuous printing with the lever set at a position higher than 2 can shorten the life of the print head. Printing past the edge of envelopes, multi-part forms, labels, or thicker-than-normal paper can damage the print head.

Multi-part Forms

With the built-in tractor unit, your printer can print on continuous multi-part forms. You can use multi-part forms that have up to three parts including the original. Make sure you set the paper thickness lever to the proper position; see the table on page 2-22.

Setting the DIP Switches

Your printer has two sets of DIP (Dual Inline Package) switches located under a small cover above the control panel. By changing the settings of these switches, you can control various printer features, such as the character set and page length. The new settings become effective when the printer is turned on, reset, or initialized.

DIP switch settings are shown in the DIP switch tables starting on page 3-7. Descriptions of all the DIP switch functions begin on page 3-9.

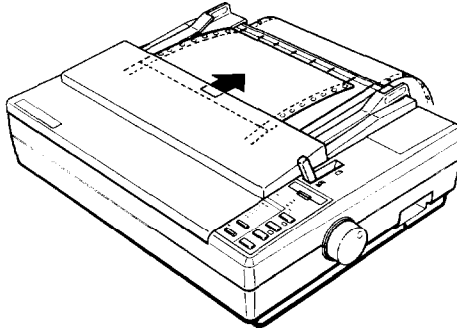
Changing a DIP Switch Setting

To change a DIP switch setting, first turn off the printer. Then open the DIP switch cover and use a pointed object, such as a pen, to change the DIP switch settings. A DIP switch is on when it is up, and off when it is down.

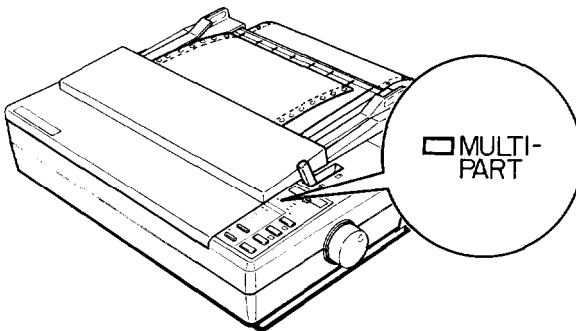
The new DIP switch settings take effect when the printer is turned on.

Using Short Tear-Of

1. Make sure the printer feeds the paper to the tear-off position after printing the document.



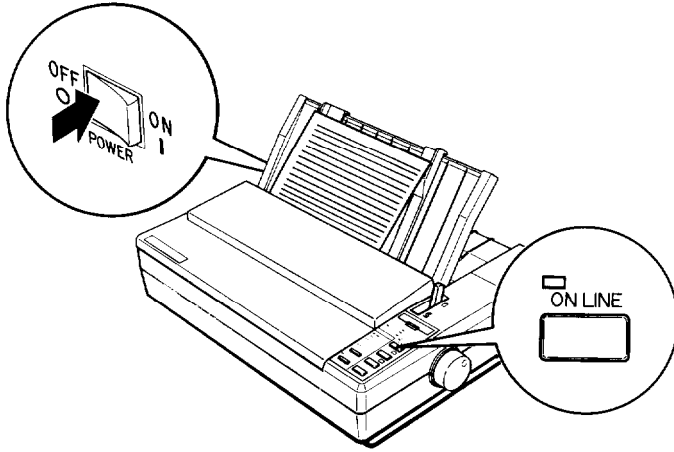
2. The MULTI - PART light should begin blinking, indicating that you can now use the micro-adjustment feature to make fine adjustments to the tear-off position.



3. To make fine adjustments to the tear-off position, press the FORM FEED button to feed the paper forward or the LINE FEED button to feed it backward.

You can now tear off your document from the perforation and resume printing. The printer remembers this new tear-off position even after the printer is turned off and on again.

4. To turn off the data dump mode after you have taken the printer off line, turn off the printer.



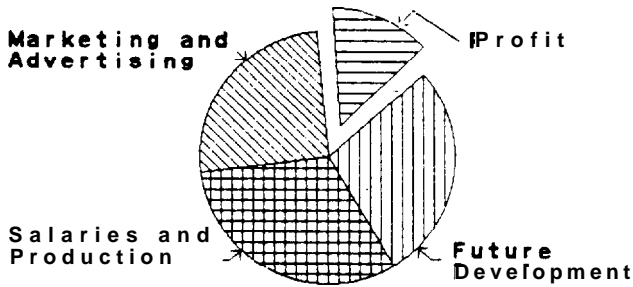
By comparing the characters printed in the text field on the right side of the data dump printout (see step 3) with the printout of hex codes, you can check which codes are being sent to the printer.

To interpret the data dump printout, examine the first three hex codes on the second line of the printout sample (20 20 54). Each hex code 20 represents a space; hex code 54 represents the letter T. Check the second line of the text field **on** the right side of the printout and you will find the letter T preceded by two spaces.

The chart below interprets the first eight codes.

Hex codes	Command	Function
1B 40	ESC	Initialize printer
1B 52 00	ESC R 0	Select USA character set
1B 74 01	ESC t1	Select Epson Extended Graphics set

Income Breakdown



The Print Head

To understand dot graphics you need to know a little about how your printer's print head works.

The print head has 24 pins. As the print head moves across the page, electrical impulses cause the pins to fire. Each time a pin fires, it strikes the inked ribbon and presses it against the paper producing a small dot. As the print head moves along, the pins fire time after time in different patterns forming letters, numbers, and symbols.

Because the dots overlap each other both horizontally and vertically in Letter Quality mode, it is difficult to see the individual dots. Instead, the letters and symbols seem to be made up of unbroken lines.

In order for the dots to overlap vertically, the pins in the print head are in more than one column, but the intelligence of the printer handles the timing of pin firings so that the effect is that of 24 pins arranged in a single vertical column.

Dot patterns

The print head is able to print graphics, as well as text because graphic images are formed on the printer in about the same way that pictures in newspapers and magazines are printed. If you look

User-defined Characters

With this printer, it is possible to define and print characters of your own design. You can design an entirely new alphabet or typeface, create special characters for use as mathematical or scientific symbols, or create graphic patterns with user-defined characters to serve as building blocks for larger designs.

Below, you can see samples of typefaces created with the user-defined character function.

ABCDEFGHIJKLMN OPQRSTUVWXYZ
ABCDEFGHI6HIJKLMN OPQRSTUVWXYZ

Note: To use user-defined characters, you must turn DIP switch 2-5 off.

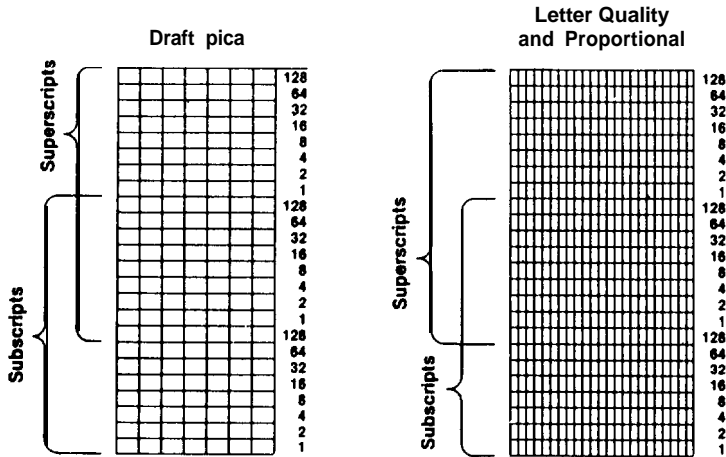
You can make the task of defining characters easier by using a commercial software program that assists you in creating characters or simply supplies you with sets of characters already created. Also, some popular software programs make use of the printer's user-defined character function to enhance printouts. (These characters are called download characters in some programs.)

The standard ASCII characters are stored in the printer's Read Only Memory (ROM) or optional Multi-Font Module, and the user-defined characters are stored in the printer's Random Access Memory (RAM).

Designing Your Characters

User-defined characters are like dot graphics because you send the printer precise instructions on where you want each dot printed. In fact, planning a user-defined character is like planning a small dot graphics pattern.

Since superscript and subscript characters are smaller, when you define them you only need two bytes of data for each vertical row of dots. Design grids for these characters are shown in the figure below:



Mixing Print Styles

Each of the three user-defined character modes (draft, Letter Quality, and proportional) can be used in combination with most of your printer's various print styles. For instance, emphasized mode works with user-defined characters. The characters you design are enhanced to give this printing effect.

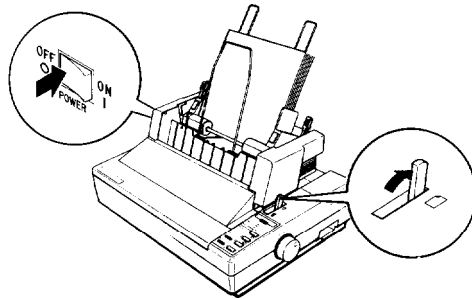
Mixing the three types of user-defined character sets is not possible. For example, if you select draft and define some characters, then select proportional and define some more, the first draft character definitions are deleted. Only one type of character definition may be stored in RAM at any time.

Testing the Printer in the Cut Sheet Feeder Mode

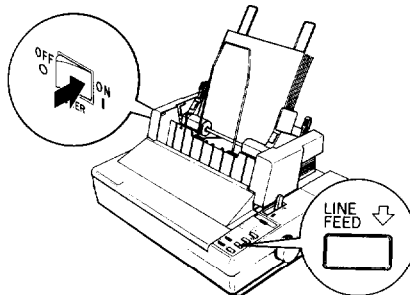
When you perform the cut sheet feeder self test, the printer counts the number of lines on the page. As shown on the following page, the number of lines counted is printed out at the bottom of the first test page. This number is the default page-length setting. This setting, however, can be overridden by software commands.

Running the self test is the same as when the cut sheet feeder mode is off. The steps below are for a self test in draft mode.

1. Make sure that the printer is turned off and a stack of paper is in the bin. Check that the cut sheet feeder mode is selected and the paper release lever is pushed to the rear.



2. While holding down the **LINE FEED** button, turn on the printer. (For LQ mode, press the **FORM FEED** button instead of the **LINE FEED** button.)



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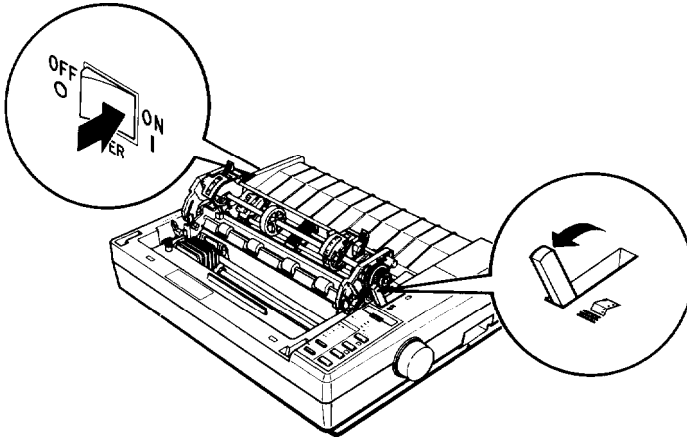


- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

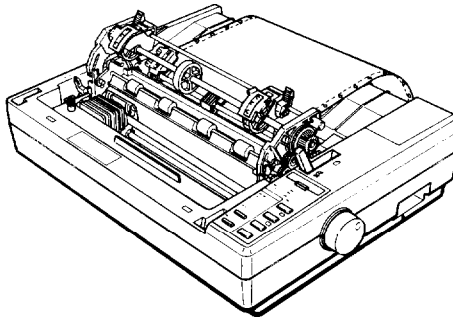
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Paper Handling

1. Make sure that the printer is turned on and that the paper release lever is set forward to the continuous paper position.



2. Set the first three holes of the continuous paper onto the built-in push tractor as described in Chapter 2.



Script

!"#\$%&'()*+,-./0123456789:;<=>?àABCDEFGHIJK
LMNOPQRSTUVWXYZ°çš^_`abcdefghijklmnopqrstuv
wxyzéùè"ÇüéäääääçêëëëïïiÄÅÆæÆøöòûüÿÖÜø£¥Ptáíó
úñÑ@Q;,-~½¼j«»

We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

OCR-B

!"#\$%&'()*+,-./0123456789:;<=>?àABCDEFGHIJK
LMNOPQRSTUVWXYZ°çš^_`abcdefghijklmnopqrstuv
wxyzéùè"ÇüéäääääçêëëëïïiÄÅÆæÆøöòûüÿÖÜø£¥Ptáíó
úñÑ@Q;,-~½¼j«»

We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

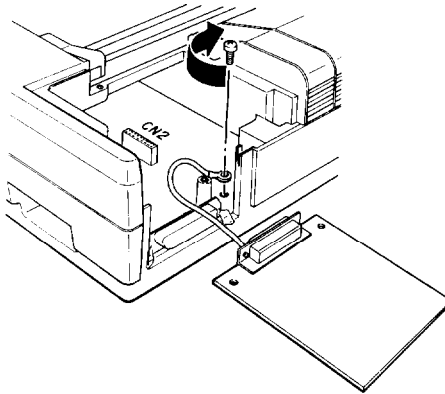
OCR-A

!"#\$%&'()*+,-./0123456789:;<=>?àABCDEFGHIJK
LMNOPQRSTUVWXYZ°çš^Habcdefghijklmnopqrstuv
wxyzéùè"ÇüéäääääçêëëëïïiÄÅÆæÆøöòûüÿÖÜø£¥Ptáíó
úñÑ@Q;,-~½¼j«»

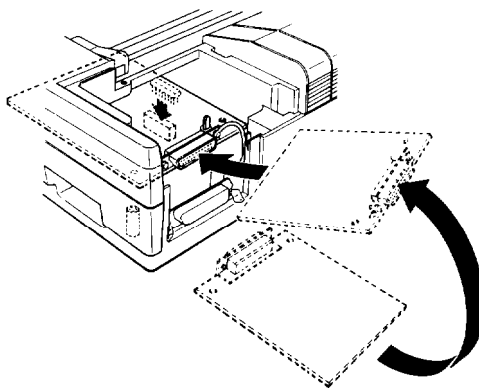
We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

FG wire attached

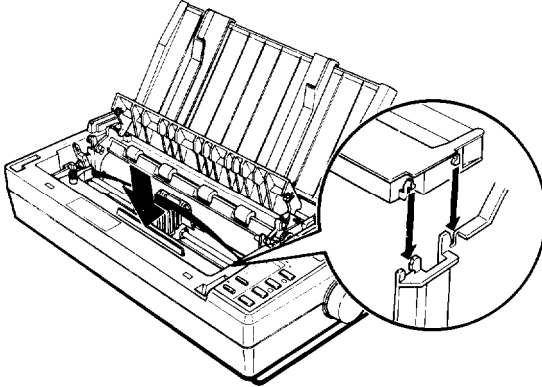
1. Carefully place the interface board next to the printer as shown below. Use the CG screw to connect the round end of the FG (frame ground) wire to the main board.



2. Holding the interface board level, rotate it into position and attach it to the main board. Make sure that the connector pins are properly inserted into the mating connector.



6. Push the new ribbon cartridge firmly into position, making sure the plastic hooks fit into the slots, as shown below.



Note: Press lightly on both sides of the cartridge to make sure the hooks are properly inserted.

Problem**Solution****The print is faint or uneven (continued).**

The printout is faint.

The ribbon may be worn out. A worn ribbon can damage the print head and should be replaced. Install a new ribbon cartridge. See Chapter 6.

The paper thickness lever may not be set correctly for the paper you are using. Set the paper thickness lever to match the thickness of your paper. See Chapter 2.

Dots are missing in the printed characters or graphics.

A line of dots is missing in the printout.

ABCD

The print head is damaged. Stop printing and call the Epson Consumer Information Center at 1-800-922-8911 to find out where to have the printer repaired.

Dots are missing in random positions.

ABCD

There is either too much slack in the ribbon or the ribbon has come loose and gotten caught on something. Stop printing, turn off the printer, and reinstall the ribbon cartridge. See Chapter 6.

Problem**Solution**

Continuous paper does not feed properly.

When the LOAD/EJECT button is pressed, the platen does not rotate and paper does not feed.

When the LOAD/EJECT button is pressed, the platen rotates but paper does not feed.

You may be trying to feed paper using the control panel buttons while the printer is on line (ON LINE light on). Press the ON LINE button once to set the printer off line, then try feeding paper. After feeding paper, press the ON LINE button again to set the printer on line. See Chapter 3.

The paper release lever may be pushed back to the single-sheet position. When using the tractor, be sure the paper release lever is pulled forward to the continuous paper position. See Chapter 2.

Continuous paper may have already been in the paper path. (In this case, the paper feeds backward to the standby position.) Press the LOAD/EJECT button again to load the paper.

Problem**Solution**

Using the cut sheet feeder, the paper does not feed properly (continued).

The paper feed is crooked.

You tried to manually insert a single sheet, but instead paper was fed from the cut sheet feeder's bin.

The paper may be old or creased. Discard it and load new, clean sheets of paper.

The left and right paper guides may be too far apart. Adjust the paper guides to the width of the paper.

There may be too much outgoing paper. Never let more than 80 sheets of outgoing paper accumulate while printing.

The weight of your paper may be too heavy or too light for the cut sheet feeder. Refer to the specifications in Chapter 8 and make sure that your paper is the proper size and quality.

The single sheet may have been inserted in the wrong place. Check it and try again. See Chapter 5.

Paper may feed from the bin if you try to insert several single sheets. To insert several single sheets, pull the paper set lever forward.

Printable columns:

Character spacing	Maximum printed characters
10 cpi	80
10 cpi condensed	137
12 cpi	96
12 cpi condensed	160

Input buffer: 8 KB/1KB
(DIP switch selectable)

Optional fonts: LQ Epson Courier
LQ Epson Prestige
LQ Epson Script
LQ Epson OCR-B
LQ Epson OCR-A
LQ Epson Orator
LQ Epson Orator-S

Character fonts:

Font	Available sizes (Characters per inch)
Epson Draft	10, 12, 15
Epson Roman	10, 12, 15, Proportional
Epson Sans Serif	10, 12, 15, Proportional

Characters: 96 standard ASCII character set (including italic characters)
15 international character sets
Epson Extended Graphics character set

Option Specifications

Single-bin Cut Sheet Feeder (Optional)

Dimensions and weight: 17.5 in (W) x 17.1 in (D) x 16.7 in (H)
(444 mm (W) x 434 mm (D) x 423 mm (H))
(mounted on the printer)
approx. 2.4 lb (1.1 kg)

Bin capacity: Single sheet: Up to 150 sheets of 22 lb
Up to 100 sheets of 17 lb
Up to 100 sheets of 24 lb

(Total thickness should not exceed
9/32 inches or 15 mm)

Stacker capacity: Single sheet: Up to 80 sheets of 22 lb
Up to 100 sheets of 17 lb
Up to 55 sheets of 24 lb

MCBF: 100,000 cycles

Environmental condition:

Temperature

Operation: 40°F to 95°F (5°C to 35°C)

Storage: -22°F to 140°F (-30°C to 60°C)

Humidity

Operation: 15% to 80% (noncondensing)

Storage: 5% to 85% (noncondensing)

ASCII	Dec.	Hex.	Description	Page
ESC N	78	4E	Set Skip Over Perforation	9-14
ESC O	79	4F	Cancel Skip Over Perforation. . .	9-14
ESC P	80	50	Select 10 CPI	9-24
ESC Q	81	51	Set Right Margin	9-19
ESC R	82	52	Select an International Character Set.	9-35
ESC S0	83	53	Select Superscript Mode	9-29
ESC S1	83	53	Select Subscript Mode	9-30
ESCT	84	54	Cancel Superscript/Subscript Mode	9-30
ESC U	85	55	Turn Unidirectional Mode On/Off	9-10
ESC W	87	57	Turn Double-wide Mode On/Off.	9-27
ESC Y	89	59	Select High-speed Double-density Graphics Mode.	9-38
ESC Z	90	5A	Select Quadruple-density Graphics Mode	9-39
ESC \	92	5C	Set Relative Print Position	9-21
ESC a	97	61	Select Justification	9-33
ESC b	98	62	Set Vertical Tabs in Channels. . .	9-18
ESC g	103	67	Select 15 CPI	9-24
ESC k	107	6B	Select Typestyle Family.	9-23
ESC l	108	6C	Set Left Margin.	9-19
ESC p	112	70	Turn Proportional Mode On/Off.	9-25
ESC q	113	71	Select Character Style	9-32
ESC t	116	74	Select Character Table	9-34
ESC w	119	77	Turn Double-high Mode On/Off.	9-28
ESC x	120	78	Select Letter Quality or Draft . . .	9-22

VT **Tab Vertically**

Format:

ASCII code: VT
 Decimal: 11
 Hexadecimal: 0B

Comments:

Advances the paper to the next vertical tab position in the channel selected by ESC /. If no channel has been selected, channel 0 is used. If no vertical tabs have been set, the paper advances one line.

ESC B **Set Vertical Tabs**

Format:

ASCII code:	ESC	B	n1	n2	.	.	.	0
Decimal:	27	66	n1	n2	.	.	.	0
Hexadecimal:	1B	42	n1	n2	.	.	.	00

Comments:

Sets up to 16 vertical tabs in the current line spacing. Tab settings are not affected by subsequent changes in line spacing. The tab settings are entered as n1, n2, etc.-all from 1 to 225, in ascending order. The 0 value (null) indicates the end of the command. All settings are stored in channel 0 (see ESC b). ESC B 0 clears the tab settings.

ESC SO **Select Double-wide Mode (one line)**

Format:

ASCII code:	ESC	SO
Decimal:	27	14
Hexadecimal:	1B	0E

Comments:

Duplicates the SO command.

ESC W **Turn Double-wide Mode On/Off**

Format:

ASCII code:	ESC	W	<i>n</i>
Decimal:	27	87	<i>n</i>
Hexadecimal:	1B	57	<i>n</i>

Comments:

Doubles the width of all characters.

The following values can be used for *n*:

- 1: Turns mode on.
- 0: Turns mode off.

DC4 **Cancel Double-wide Mode (one line)**

Format:

ASCII code:	DC4
Decimal:	20
Hexadecimal:	14

Comments:

Cancels double-wide mode selected by SO or ESC SO, but not double-wide mode selected by ESC W or ESC !.

ESC % **Select User-defined Set**

Format:

ASCII code:	ESC	%	<i>n</i>
Decimal:	27	37	<i>n</i>
Hexadecimal:	1B	25	<i>n</i>

Comments:

This sequence is used to print the user-defined (download) character set. ESC & is required to define the character set. The following values can be used for *n*:

- 0: Selects the normal set.
- 1: Selects the user-defined set.

ESC 6 **Enable Printable Characters**

Format:

ASCII code:	ESC	6
Decimal:	27	54
Hexadecimal:	1B	36

Comments:

When the Epson Extended Graphics character table is selected, ESC 6 enables the printing of codes 128 through 159 (decimal) as characters, not control codes. See the Appendix for characters printed.

ESC 7 **Enable Upper Control Codes**

Format:

ASCII code:	ESC	7
Decimal:	27	55
Hexadecimal:	1B	37

Comments:

When the Epson Extended Graphics character table is selected, ESC 7 causes codes 128 through 159 to be treated as control codes. This is the default.

Epson Extended Graphics Character Table

CODE	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			0	@	P		p	Ç	É	á		L	⊥	a	≡	
1		!	1	A	Q	a	q	ü	æ	í		⊥	⊥	β	±	
2		"	2	B	R	b	r	é	ƒ	6	⊥	Γ	≥			
3		#	3	C	S	c	s	â	ô	ú		⊥	⊥	π	≤	
4		\$	4	D	T	d	t	ä	ö	ñ	⊥	-	⊥	Σ	∫	
5	§	%	5	E	U	e	u	à	ò	Ñ	⊥	+	⊥	σ	J	
6		&	6	F	V	f	v	å	û	<u>a</u>	⊥	⊥	⊥	μ	÷	
7		'	7	G	W	g	w	ç	ù	ó	⊥	⊥	⊥	τ	≈	
8		(8	H	X	h	x	ê	ÿ	¿	⊥	⊥	⊥	Φ	°	
9)	9	I	Y	i	y	ë	Ö	⊥	⊥	⊥	J	θ	.	
A		*	:	J	Z	j	z	è	Ü	⊥	⊥	⊥	⊥	Ω	.	
B		t	;	K	[k	{	ï	ç	½	⊥	⊥	⊥	δ	√	n
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