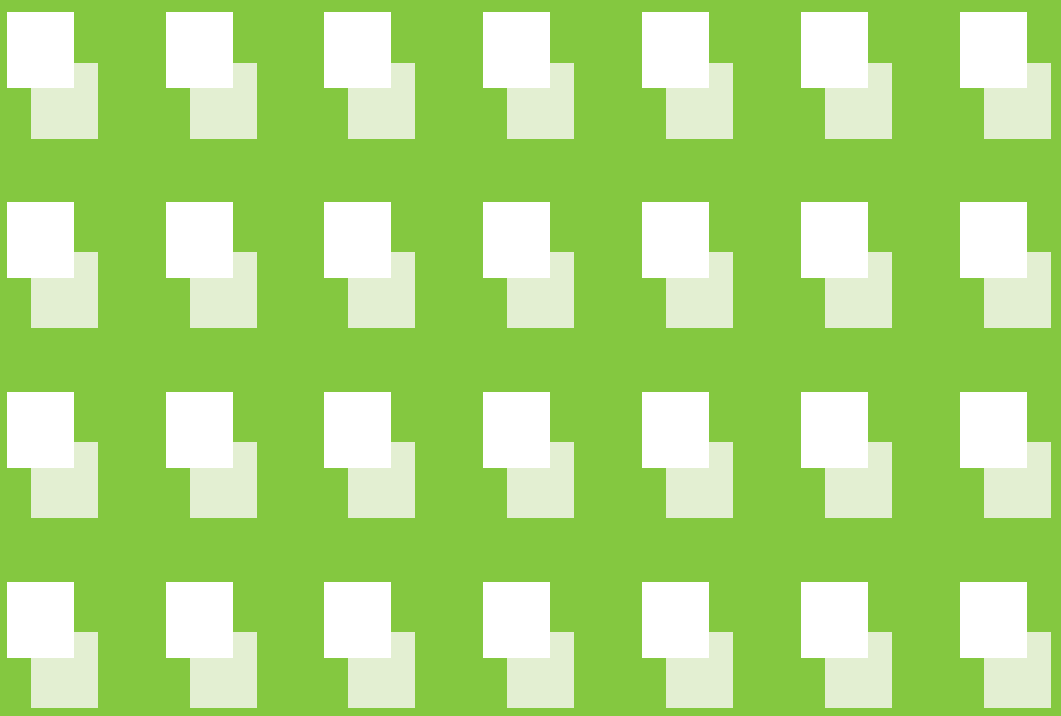
OKI

MICROLINE
ML184T+



Printer Handbook

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IMPORTANT

You have just bought the best printer, so be sure to use the only ribbons recommended for it. Original OKI ribbons are the only ones that the manufacturers recommend. Ask for them by name.

Please remember that if you buy any other ribbon your warranty may be invalidated.

Purchasing inferior ribbons really does not make sense. They do not last as long. What is more, they are prone to shredding, which can cause damage to your printhead. Any short term savings on cheap ribbons are quickly lost.

So do not waste your time and money... insist on OKI consumables for your OKI printer.

You can order them from your printer supplier.

CONTENTS

SPECIAL NOTE

This manual will help you install and use your new IBM/EPSON/OKI ML compatible MICROLINE 184 Turbo+ printer. It contains everything you need to know to print with your MICROLINE's special features. If you still need assistance after reading this book, please contact your dealer for fast personal service. If your dealer cannot answer your questions, please ask us.

Every effort has been made to ensure that the information in this document is complete, accurate, and up-to-date. OKI assumes no responsibility for the results of errors beyond its control. OKI also cannot guarantee that changes in software and equipment made by other manufacturers, and referred to in this book, will not affect the applicability of the information in this book.

IMPORTANT

The wires in this mains lead 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 apparatus may not correspond with the coloured markings identifying the terminals in your plug — PROCEED AS FOLLOWS:

The wire coloured GREEN AND YELLOW must be connected to the terminal in the plug marked with the letter E or by the safety earth symbol or coloured GREEN or GREEN AND YELLOW. The wire coloured BROWN must be connected to the terminal marked with the letter L or coloured RED. The wire coloured BLUE must be connected to the terminal marked with the letter N or coloured BLACK.

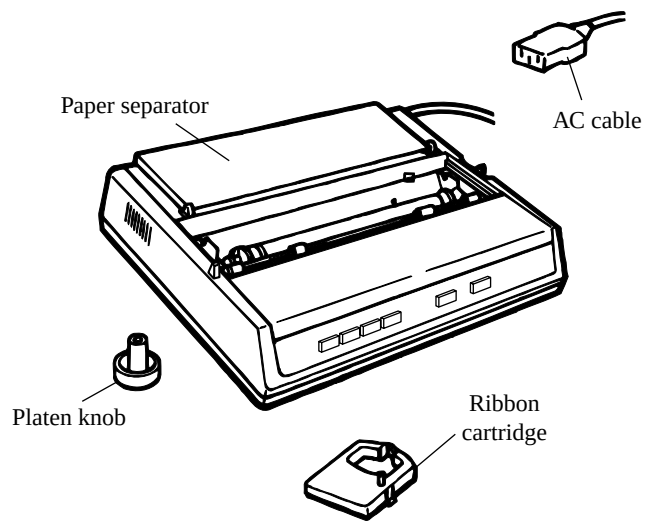
WARNING: THIS APPARATUS MUST BE EARTHED

Ensure that your equipment is connected correctly. If you are in any doubt consult a qualified electrician.

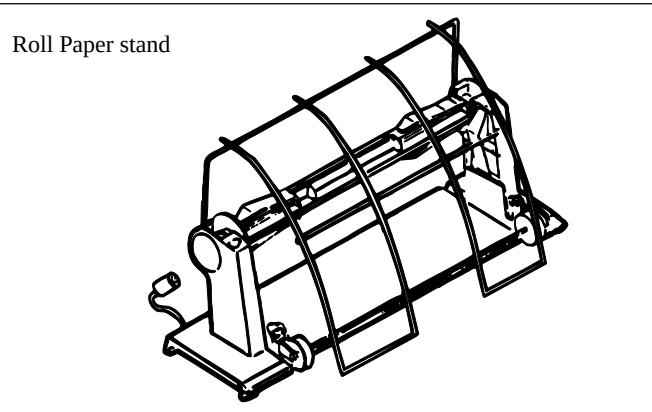
Chapter 1

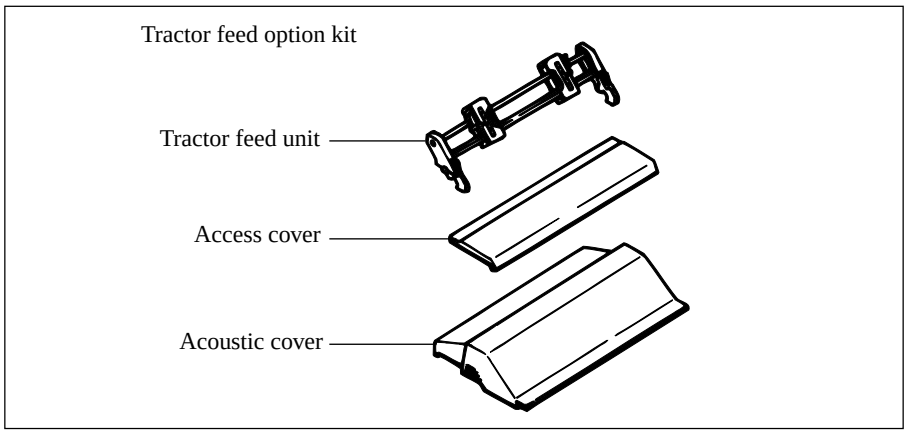
Setting Up Your Printer

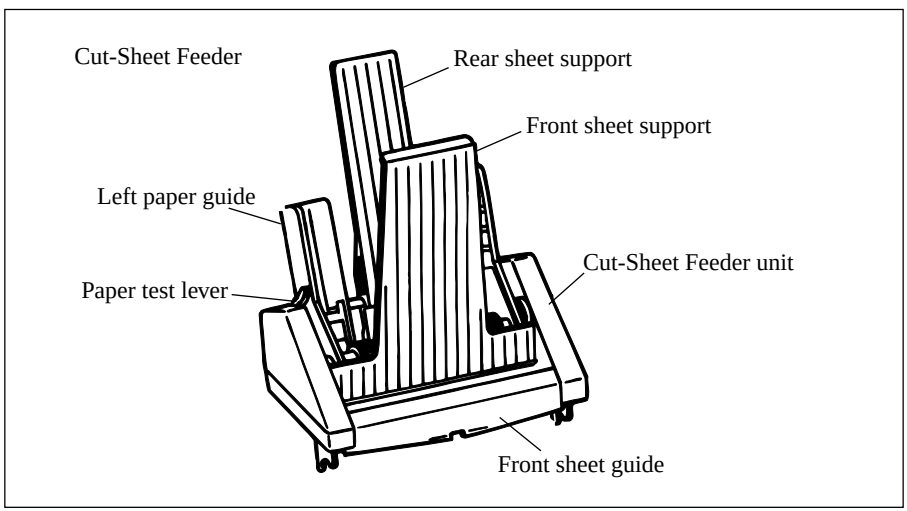
Your IBM/EPSON/OKI ML-compatible ML 184 Turbo+ printer is packed in a protective container along with some extra items you need. These items include:



Optional equipment available for your ML 184 Turbo+ printer includes:



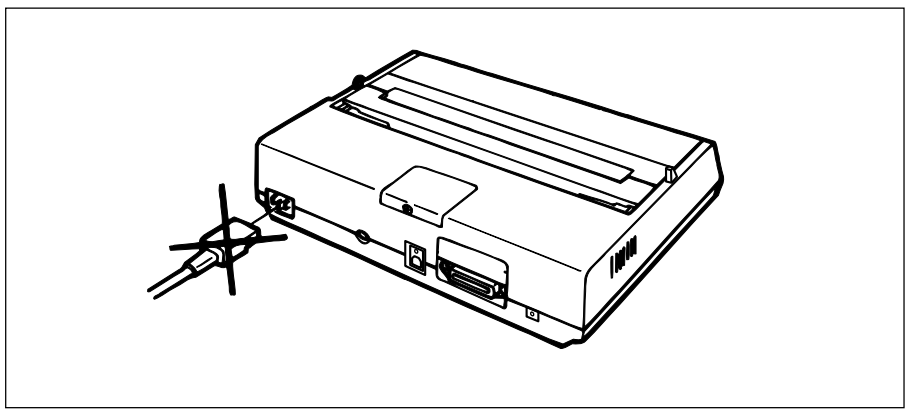




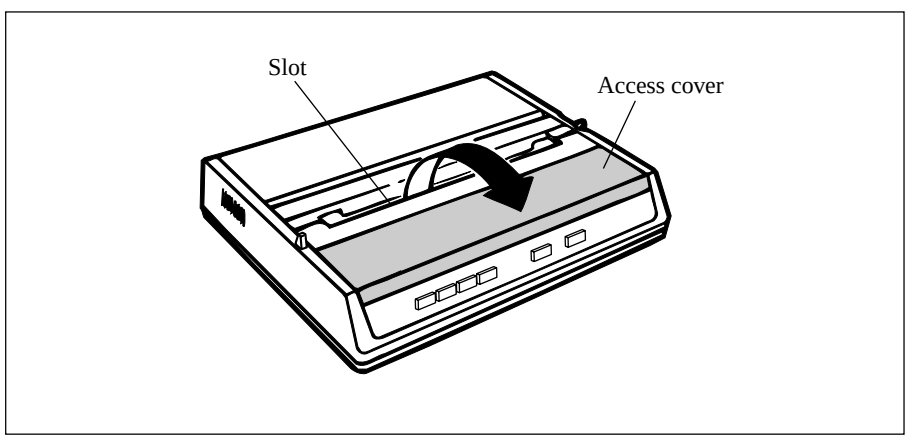
Interface Equipment:

Super-Speed (19,200 baud) RS-232C serial board

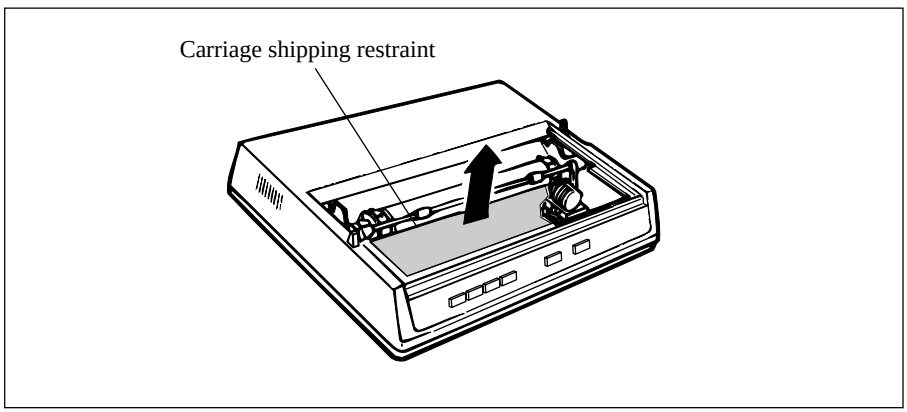
1. Do not plug in your printer until the following steps have been completed.



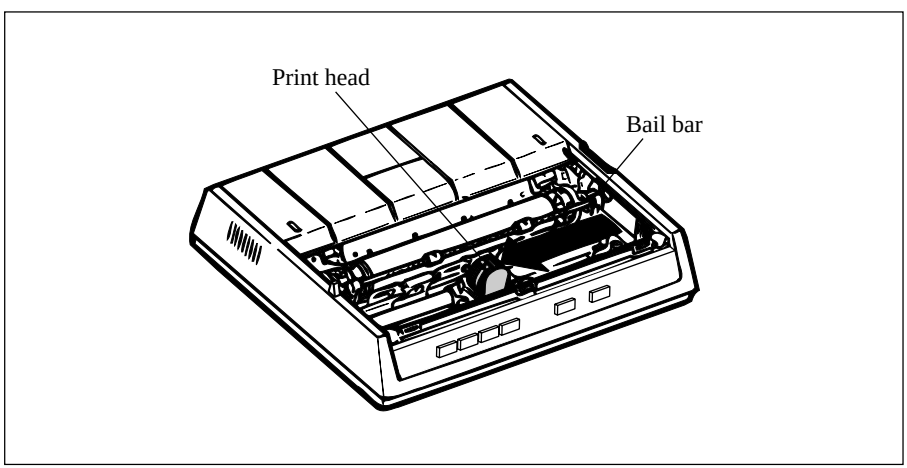
2. Remove the access cover by inserting your hand in the top cover slot (see figure below) and lifting.



3. Remove the carriage shipping restraint that keeps the print head in place.

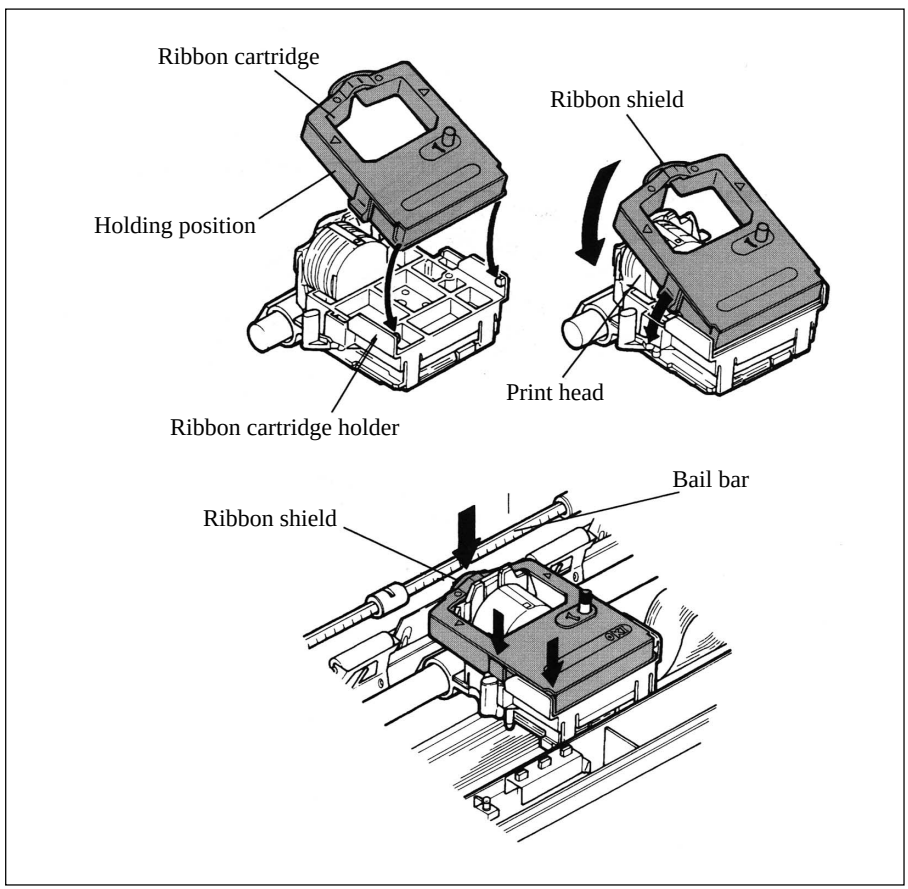


4. Gently slide the print head to the middle of the printer or to the lefthand side so that it is away from the rollers on the Bail bar.



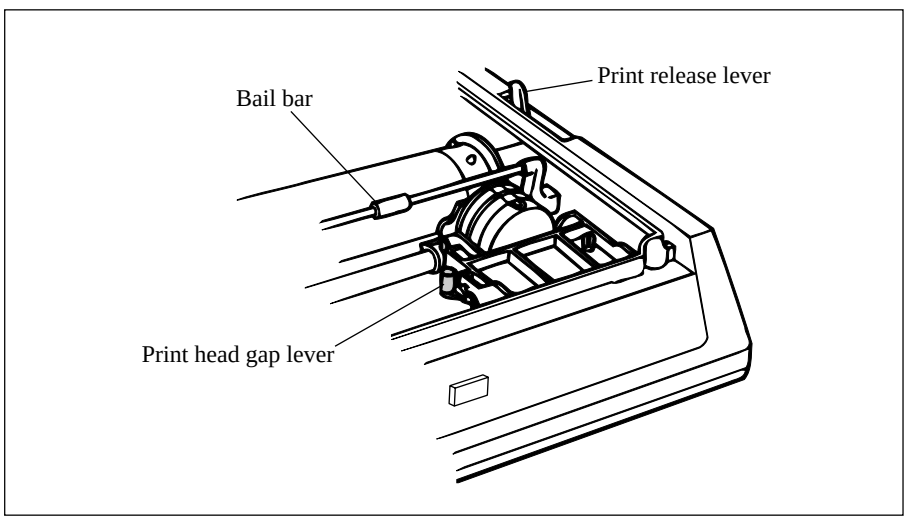
5. Place the black ribbon cartridge on the ribbon cartridge holder. The easiest method is to tilt the back of the cartridge so that it slides into the area of the plate that is nearest the front of the printer, then lower the top of the cartridge (where the plastic ribbon shield is located) over the print head. The tabs on both sides of the cartridge should align perfectly with the inserts on the print head plate.

Important: Only use genuine OKI ribbon cartridges in your printer. Do not remove the ribbon shield.

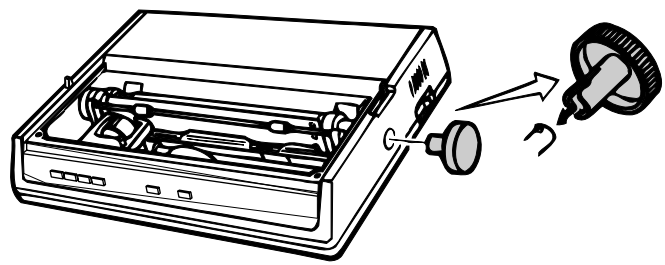


6. Press gently on the cartridge until you feel it snap into place. To remove the ribbon cartridge, make sure the print head is moved away from the edge of the platen, then grasp the cartridge on both sides of the print head and lift up.

7. The blue lever located to the left of the ribbon cartridge is used to adjust the print head gap for single or multi-part paper. When single part paper or two part paper is in the printer, slide the blue lever forwards towards the print head. To print on three or four part paper, slide the lever towards the front of the printer.



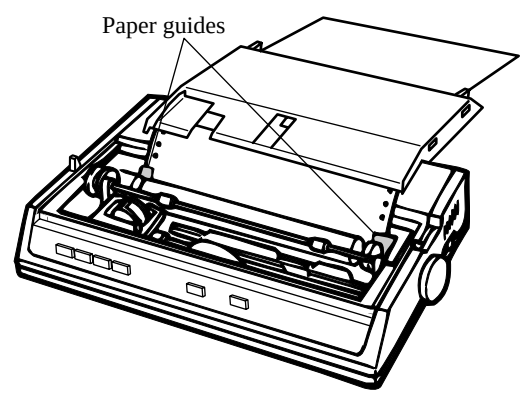
8. Put the platen knob shaft in the hole on the right-hand side of the printer as shown.



9. Try running a self test to make sure your new printer is working correctly. Insert a piece of computer paper (with sprocket holes) or a single sheet of typing paper into the printer as you would insert it in a typewriter. If you are unfamiliar with typewriters, here is the method:

   a. Open the paper release lever by sliding it towards you.

   b. After letting the slit of the paper separator pass, the paper as far as you can into the slots provided by the black paper guides.



c. Close the paper release lever.

d. Turn the platen knob clockwise away from you to pull the paper around the platen and behind the Bail bar.

e. Move the Bail bar back on to the platen so that the rollers rest on the paper you have just inserted.

10. Advance the paper, using the platen knob, until 1 inch of paper appears above the Bail bar.

11. Replace the access cover:

    a. Insert the three tabs in the edge of the access cover into the holes on the top front edge of the printer.

    b. Lower the access cover on to the printer.

12. Grasp the paper and pull it through the opening in the access cover. Use the platen knob if you need more paper.

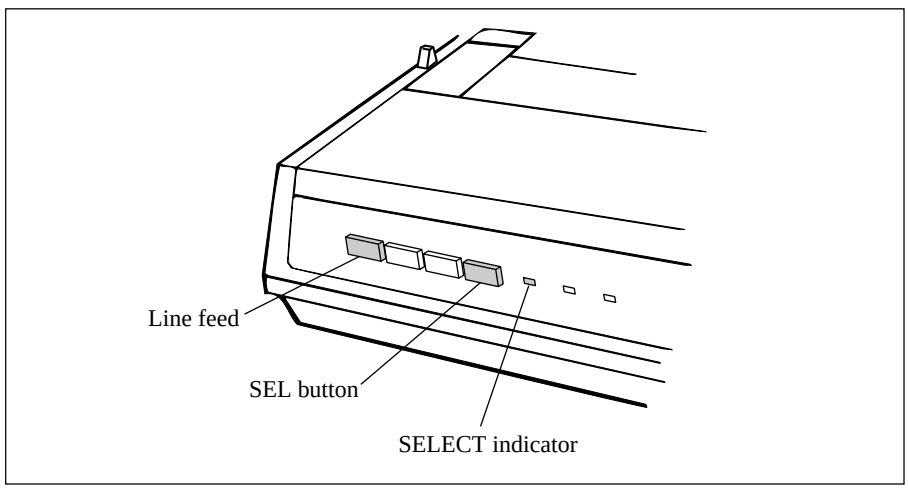
13. Insert the connector end of the power cord into the socket at the rear of the printer.

14. Make absolutely certain that the ON/OFF power switch on the side of the printer is OFF. (A sudden power surge can damage the printer.)

15. Plug the power cord into a earthed (three-pronged) electrical socket.

Important: The printer must be earthed at all times.

16. To print the self test, hold down the LF (line feed) and SEL (SELECT) button (located on the front panel) and turn the power switch ON. When the printer is powered on (indicator lights), release the LF and SEL button.



17. The following test pattern will be printed, beginning with a printer revision number that is followed by a rolling character pattern.

```
ML184T+     MEI A     F/W 00.09    42434401YR-00
                      CG  03.00
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
```

Note: During self test printing the SELECT indicator is not lit.

18. To stop the test, press the SEL button (located on the front panel) or turn the power switch OFF.

After the printer has shown that it is functioning correctly, you are ready to connect your computer. First, you need an interface cable. If you do not have one, see your computer dealer or, if you have the equipment and the technical expertise, make your own cable using the instructions in Appendix C.

Attention: Install your printer away from a CRT. An electromagnetic field may create a distortion on your computer screen.

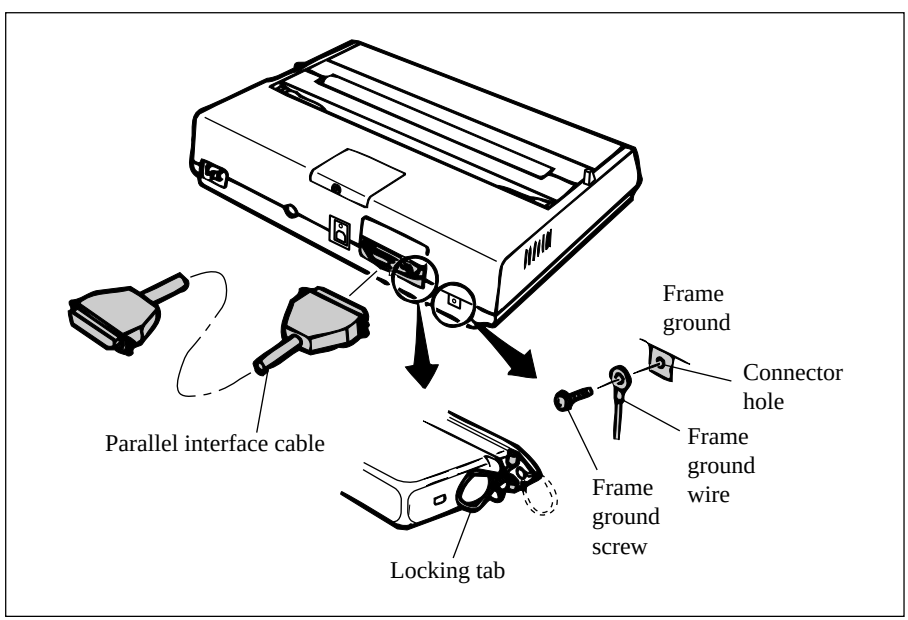
Connecting to Your Computer

You will need either a parallel, usb or serial interface cable to connect your computer to your ML 184 Turbo+ printer. Before you connect the cable, make sure both printer and computer power is OFF.
* More than one interface cannot be connected simultaneously.

Connecting a Parallel Interface

1. Insert the 36-pin plug into the appropriate socket on the rear of the printer.

   If there is no frame ground (FG) included in your interface cable, connect a frame ground wire from the computer to the frame ground connection hole at the back of the printer.



2. Snap the two wire locking tabs on to the plug.

3. Insert the other end of the cable into your computer. You may also connect it to another peripheral device, such as a disk drive, if your equipment is designed for daisychain connection.

4. Turn on the equipment and try the one line BASIC program shown below, using the proper print statement for your computer (the example uses LPRINT). Make sure you have paper and ribbon in the printer.

5. Type: LPRINT “Everything’s okay” and then run the program.

6. Your printer should print “Everything’s okay” at 10 characters per inch.

Note: If the printer did not print, make sure you entered the program correctly. Some computers require that you assign a number to the printer and specify that number in your print statement; for example OPEN # 3 means the printer is on line # 3 to the computer.

7. Now try this BASIC program (change it, if necessary, to suit your computer’s requirements):

```
10 LPRINT “EVERYTHING’S OKAY”
20 LPRINT “THIS LINE SHOULD BE SPACED 1/6“”;
   CHR$(34);”UNDER THE FIRST”
```

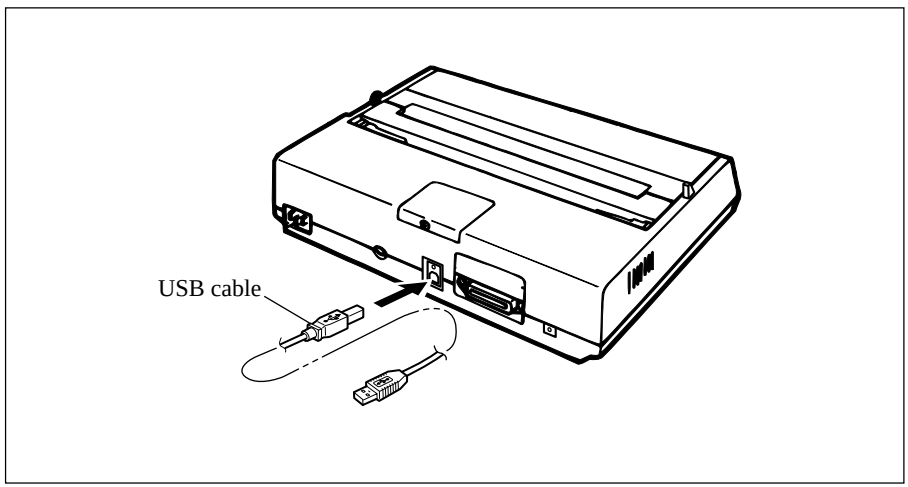
8. The printout should look like this:

```
EVERYTHING’S OKAY
THIS LINE SHOULD BE SPACED 1/6″ UNDER THE FIRST
```

If it is overprinted, make a small adjustment to the printer menu settings so that a line feed is automatically inserted at the end of a line.

Connecting a USB Interface

1. Connect a USB cable to a USB port on the back of a printer.



Serial Interfaces

The Super-Speed board has a maximum speed of 19,200 baud with a choice of either printer Ready/Busy or XON/XOFF protocol.

Before connecting your interface cable, make sure both your printer and computer are off. If you are using a serial cable, you are probably required to use an OPEN and PR #1 statement in BASIC programming instead of LPRINT. Consult your computer documentation for details.

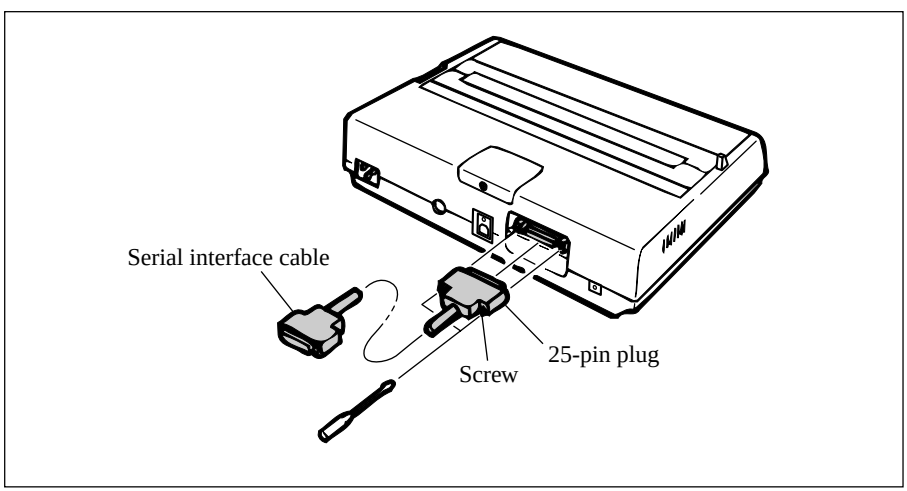
Connecting a Serial Interface

1. Insert the 25-pin plug in the socket on the rear of the printer.

2. Tighten the mounting screw on each side of the connector shell so that it is securely attached to the printer.

3. Insert the other end of the cable into your computer. You may also be able to connect the cable to another peripheral device, such as a disk drive, if your equipment accommodates daisychain connection.

4. Make sure you have a ribbon cartridge and paper in the printer.



5. Turn ON the power and try this one line BASIC program to make sure the connection is correct:

LPRINT “Everything’s okay”

Note: Your computer may require a different print statement such as PRINT # 1 or PR #1. Check your computer documentation for details.

6. Run the program. Your printer should print this at 10 characters per inch:

```
Everything’s okay
```

7. Now try this BASIC program (modify it to suit your computer requirements):

```
10 LPRINT “Everything’s okay”
20 LPRINT “This line should be spaced 1/6”;
   CHRS(34); “under the first”
```

8. The printout should look like this:

```
Everything’s okay
This line should be spaced 1/6” under the first
```

9. If the two lines of text have overprinted each other, you will have to change the printer menu settings so that a line feed is automatically inserted at the end of a line.

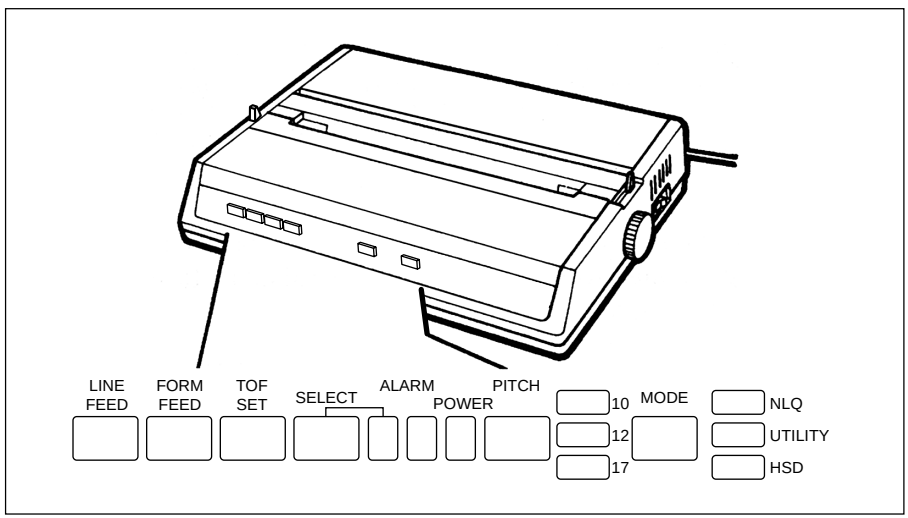
Chapter 2

Operating Your Printer

Buttons, Levers and Indicators

Before using your printer, it is worth familiarising yourself with the buttons, levers and indicators on the printer and to understand the various methods of loading paper.

The front panel of the printer has six buttons, two of which were briefly introduced in the setup procedure. In addition, there are indicator lights that show the status of the printer, mode and pitch selected.



POWER Indicator: Indicates that the printer power is turned ON.

SEL Button: Pressing this button after the printer power is ON places the printer in deselect mode. In this mode the computer cannot communicate with the printer. To return to select mode, simply press this button again. Pressing this button also stops the self test. It is also used to enter into HEX-dump mode: turn the printer ON while holding down the SEL and FORM FEED buttons.

Hex mode generates data rather than text, and a sample is shown below. To terminate this mode, switch the printer off and on again.

```
Hex Data Dump

1B 41 08 0D 0A 1B 32 0D 0A 1B 4B 00 01 01 02 03       .A....2...K.....
04 05 06 07 08 09 0A 0B 0C 0D 0A 0E 0F 10 11 12       ................
13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22       ............ !"
23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F 30 31 32       £$%&'()*+,-./012
33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F 40 41 42       3456789:;(=)?@AB
43 44 45 46 47 48 49 4A 4B 4C 4D 4E 4F 50 51 52       CDEFGHIJKLMNOPQR
53 54 55 56 57 58 59 5A 5B 5C 5D 5E 5F 60 61 62       STUVWXYZ[\]^_`ab
63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72       cdefghijklmnopqr
73 74 75 76 77 78 79 7A 7B 7C 7D 7E 7F 80 81 82       stuvwxyz{|}~....
83 84 85 86 87 88 89 8A 8B 8C 8D 8E 8F 90 91 92       ................
93 94 95 96 97 98 99 9A 9B 9C 9D 9E 9F A0 A1 A2       ............ !"
A3 A4 A5 A6 A7 A8 A9 AA AB AC AD AE AF B0 B1 B2       £$%&'()*+,-./012
B3 B4 B5 B6 B7 B8 B9 BA BB BC BD BE BF C0 C1 C2       3456789:;(=)?@AB
C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE CF D0 D1 D2       CDEFGHIJKLMNOPQR
D3 D4 D5 D6 D7 D8 D9 DA DB DC DD DE DF E0 E1 E2       STUVWXYZ[\]^_`ab
E3 E4 E5 E6 E7 E8 E9 EA EB EC ED EE EF F0 F1 F2       cdefghijklmnopqr
```

Switching on the printer while holding down the Select and Line Feed buttons will generate a rolling ASCII character display. Reset the printer to terminate. A sample is shown below.

```
ML184T+     MEI A     F/W 00.09    42434401YR-00
                      CG  03.00
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
```

TOF SET Button: To set the first line position on each page (Top of Form), deselect the printer when the print head is in the desired position. You can also select 17.1 character per inch printing by holding this button down when turning printer power ON.

SELECT Indicator: Works together with the SEL button. Lights when the printer is selected (ready to receive data from the computer). The indicator is not lit when the printer is deselected or during self tests. If an abnormal status is detected during the self test, the indicator flashes.

FORM FEED Button: To advance the paper to the next page (Top Of Form), press this button while the printer is deselected. You can also select NLQ (Near Letter Quality) with this button. Just hold down the FORM FEED button while switching on the printer.

ALARM Indicator: Lights when paper supply is low or exhausted (unless you use the command to disable the alarm). Printing stops until the paper supply is replenished. It is also lit when a jam is detected using the CSF. The light flashes when high temperatures are detected in the printhead and space motor. Allow the printer to cool down before re-using.

LINE FEED Button: If you want to advance the paper one line, press this button while the printer is deselected. A DEMO page print can be generated by switching on the printer and holding down the Line Feed button. This printout illustrates the various styles of printing available from the ML 184 Turbo+. Once printed, the printer automatically reverts to 10 cpi Utility mode. An example of the DEMO page is on the next page.

```
ML184T+    MEI A    F/W 00.09   42434401YR-00
                    CG  03.00
```

HSD 10CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
pqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

SSD 12CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

HSD 17.1CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
JKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~
```

Utility 10CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
pqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

Utility 12CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

Utility 17.1CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
JKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~
```

NLQ 10CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
pqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~ !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

NLQ 12CPI

```
 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~ !
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
```

Scalable Courier 216 to 22 point

A A A

Scalable Gothic 216 to 22 point

A A A

PITCH Button:	This button allows you to manually select the character pitch. The appropriate lamp glows upon selection. The lamps also light as software changes, for example, normal to condensed, are implemented.
MODE Button:	Similar function to above, but this refers to the print quality selected: NLQ, Utility or High Speed Draft.

The levers on the printer allow you to adjust the paper.

PAPER LOCK/ RELEASE LEVER:	Open (slide forwards) for inserting paper, and adjusting paper, and when using tractor fed computer paper. Close (slide back) for use with roll paper and for single sheets.
PAPER GAP ADJUSTMENT:	Slide towards the back of the printer when inserting single sheets, and away when using multipart paper.

Menu Mode

When your printer is in the Menu Mode, you can use the front panel controls to change the defaults for the printer parameters, including emulation, page length, line spacing, typeface, pitch, etc. For example, you might want to change the page length to 14 inches if you're printing on legal-size documents, or to 3 inches if you're printing on labels or small cards.

To place your printer in the Menu Mode, To place your printer in the Menu Mode, turn on the power with pressing the SEL button.

To exit the Menu Mode, hold the PITCH button and press the MODE button. The MENU light will go out and the SEL light will come on.

Sample Menu

The menu is made up of groups of parameters. Within each group is a list of items and each of those items has several possible settings. Here's a sample Menu printout. The first column lists the groups; the second, items; the third, settings:

```
Printer Control     Emulation Mode                  EPSON

Font                Print Mode                      Utility
Font                DRAFT Mode                      SSD
Font                Pitch                           10 CPI
Font                Proportional Spacing            No
Font                Style                           Normal
Font                Size                            Single

Symbol Sets         Character Set                   Set I
Symbol Sets         Language Set                    American
Symbol Sets         Zero Character                  Unslashed
Symbol Sets         Code Page                       USA

Vertical Control    Line Spacing                    6 LPI
Vertical Control    Skip Over Perforation           No
Vertical Control    Page Length                     11 "

Set-Up              Graphics                        Bi-directional
Set-Up              Receive Buffer Size             64K
Set-Up              Paper Out Override              No
Set-Up              Print Registration              0
||||||||||||||||||||||||||  <-TOF  ||||||  PITCH+TOF  ||||||||||||||||||||||||||
Set-Up              Operator Panel Function         Full Operation
Set-Up              Reset Inhibit                   No
Set-Up              Print Suppress Effective        Yes
Set-Up              Auto LF                         No
Set-Up              Time Out Print                  Valid
Set-Up              Auto Select                     No
Set-Up              CSF/RPS Select                  RPS
Set-Up              Impact Mode                     Normal

Parallel I/F        I-Prime                         Buffer Print
Parallel I/F        Pin 18                          +5v
Parallel I/F        Auto Feed XT                    Invalid
Parallel I/F        Bi-Direction                    Enable


Printer Control     Emulation Mode                  EPSON
```

Summary of Menu Settings

The table below details the entries in the printer Menu as it comes from the factory.
The factory defaults are marked with "*".

Other entries will appear in the Menu depending on what options you have installed and what emulation is engaged.

For a complete listing of all the available Menu selections, along with explanations for each setting, see appendix D.

Group	Item	Sets
Printer Control	Emulation Mode	IBM * Epson ML
Font	Print Mode	Utility * NLQ Courier NLQ Gothic DRAFT
	DRAFT Mode	HSD SSD *
	Pitch	10CPI * 12 CPI 15 CPI 17.1 CPI 20 CPI
	Proportional Spacing	No * Yes
	Style	Normal * Italics
	Size 1)	Single * Double

Group	Item	Sets
Symbol Sets	Character Set	Set I Set II * Standard, Line Graphics, Block Graphics (ML Mode only)
	Language Set	American * French German British Danish I Swedish Italian Spanish I Japanese Norwegian Danish II Spanish II Latin American French Canadian Dutch Publisher
	Zero Character	Slashed Unslashed *
	Code Page	USA * BRASCII Canada French Abicomp Multilingual Multilingual 858 Portugal ISO8859-15 Norway
	Slashed Letter O	No * Yes
Vertical Control	Line Spacing	6 LPI * 8 LPI
	Skip Over Perforation	No * Yes

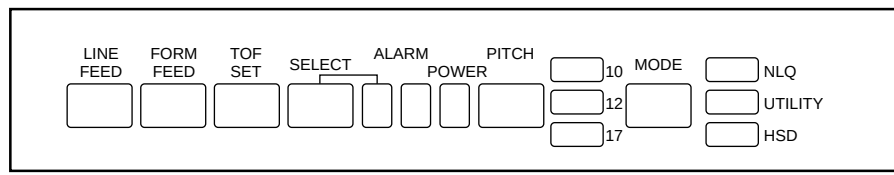
Group	Item	Sets
Vertical Control	Page Length	11" 11 2/3" 12" * 14" 17" 5" 3" 3.5" 4" 5.5" 6" 7" 8" 8.5"
Set-Up	Graphics	Bi-directional Uni-directional *
	7 or 8 Bits Graphics 4)	8 7 *
	Receive Buffer Size 2)	1 Line 32K 64K * 128K
	Paper Out Override	No * Yes
	Print Registration	0.25 mm Right 0.20 mm Right 0.15 mm Right 0.10 mm Right 0.05 mm Right 0 * 0.05 mm Left 0.10 mm Left 0.15 mm Left 0.20 mm Left 0.25 mm Left
	7 or 8 Bits Data Word 4)	8 *, 7
	Operator Panel Function 3)	Full Operation Semi Operation * Limited Operation

Group	Item	Sets
Set-Up	Reset Inhibit	No * Yes
	Print Suppress Effective	No Yes *
	Auto LF	No * Yes
	Auto CR 5)	No Yes *
	Print DEL Code 4)	No Yes *
	Sl Select Pitch (10 CPI) 5)	15 CPI 17.1 CPI *
	Sl Select Pitch (12 CPI) 5)	12 CPI * 20 CPI
	Time Out Print	Valid Invalid *
	Auto Select	No * Yes
	ESC SI Pitch 5)	17.1 CPI *, 20CPI
	CSF/RPS Select	RPS * CSF
	Impact Mode	Normal * Quiet
Parallel I/F	I-Prime	Invalid Buffer Print * Buffer Clear
	Pin 18	+ 5V * Open
	Auto Feed XT 6)	Valid Invalid *
	Bi-Direction	Enable * Disable

Group	Item	Sets
CSF 7)	Line Spacing	6 LPI * 8 LPI
	Bottom Margin	Valid Invalid *
	Page Length	11" 11 2/3" 12" * 14" 17" 5" 3.5" 4" 5.5" 6" 7" 8" 8.5"

Notes: 1. Selects both double width and double height characters OR single width and single height characters.
2. When "1 Line" is selected, the receiving buffer size is set to 2K bytes.
3. When "Limited Operation" is selected, after exiting MENU, only the SEL, LF and FF switches are valid. PRINT QUALITY, TOF and PITCH are invalid.
4. Displayed only for ML emulation.
5. Displayed only for IBM emulation.
6. Displayed only for EPSON emulation.
7. Displayed only when CFS is selected.

Menu Mode Buttons



Here is a summary of the buttons active in the Menu Mode:

1. **LINE FEED button:** Press to scan through groups of listings. Each time you press the LINE FEED button, a line will print, showing the next group in the Menu. To go back one group, hold the PITCH button while pressing the LINE FEED button.
2. **FORM FEED button:** Press to scan through items for a particular group. Each time you press the FORM FEED button a line will print, showing the next item within the group. To go back one item, hold the PITCH button while pressing the FORM FEED button.
3. **TOF SET button:** Press to change setting for the items. Each time you press the TOF SET button, a line will print across the page showing the next setting for that item. Keep pressing the button until the setting you wish to engage appears. To go back one setting, hold the PITCH button while pressing the TOF SET button.
4. **SEL button:** Press to print out listing of current settings for each items, group by group.

Resetting Menu to Factory Defaults

To reset your printer Menu to the factory settings, turn the printer off, then hold the LINE FEED and FORM FEED buttons while turning it back on again.

Paper Loading

You can load paper into the printer using several methods. If you have a printer stand with a paper slot, you can load paper through the bottom of the printer. If the printer is placed on a desk or table, paper can be loaded from the top, like typewriter paper.

If you have the optional roll paper stand, tractor feed unit, or cut-sheet feeder read the following instructions on how to install them and how to load the paper.

When you use fanfold paper, adjust the distance between the sprocket pins at the ends of the platen to correspond to the holes in the paper. You can adjust the platen pin width by extending or compressing the platen ends.

To move the platen end: Unsnap the lever, move the platen end to the left or right, then close the lever.

Bottom Feed Paper Loading

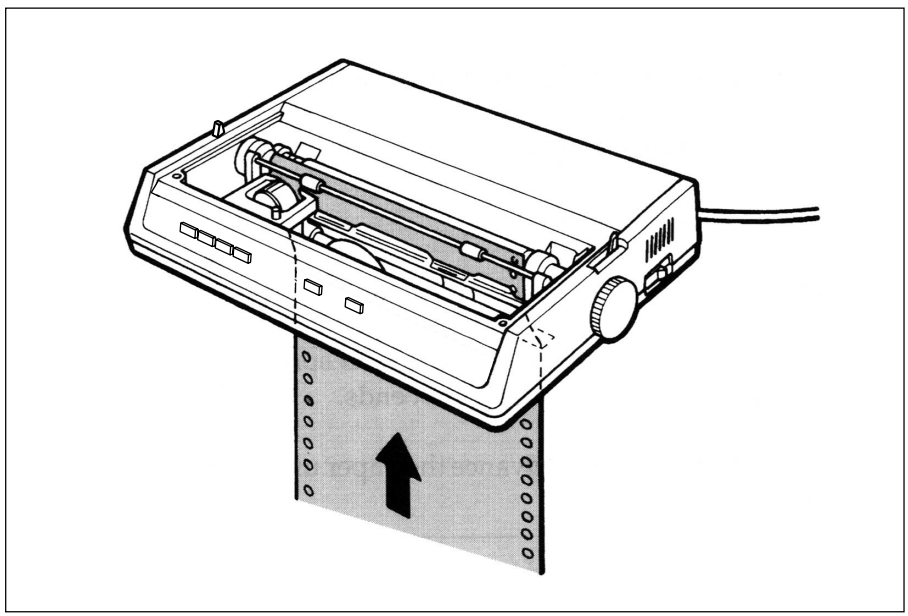
1. Place the printer on a slotted printer stand, carefully aligning the slot in the stand with the opening in the base of the printer.

2. Place the box of paper under the printer stand.

3. Remove the access cover and lift the column indicator bar.

4. Open the paper release lever.

5. Insert the first sheet of paper through the opening in the bottom of the printer.



6. Slide the paper up until it appears in front of the platen.

7. Lower the column indicator bar.

8. Close the paper release lever.

9. Use the platen knob to advance the paper to the first printing line.

10. Replace the access cover.

Rear Feed Paper Loading:

1. Put the printer on a desk or table.

2. Place the box of paper behind the printer.

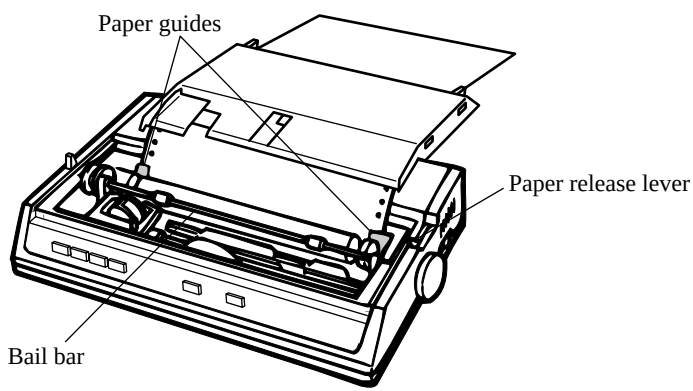
3. Remove the access cover and lift the Bail bar.

4. Open the paper release lever.

5. Insert the first sheet of paper in the paper guide after letting a paper pass to slit of the paper separator.

6. Push the paper in just enough so that its sprocket holes engage the sprocket pins located on the platen ends.

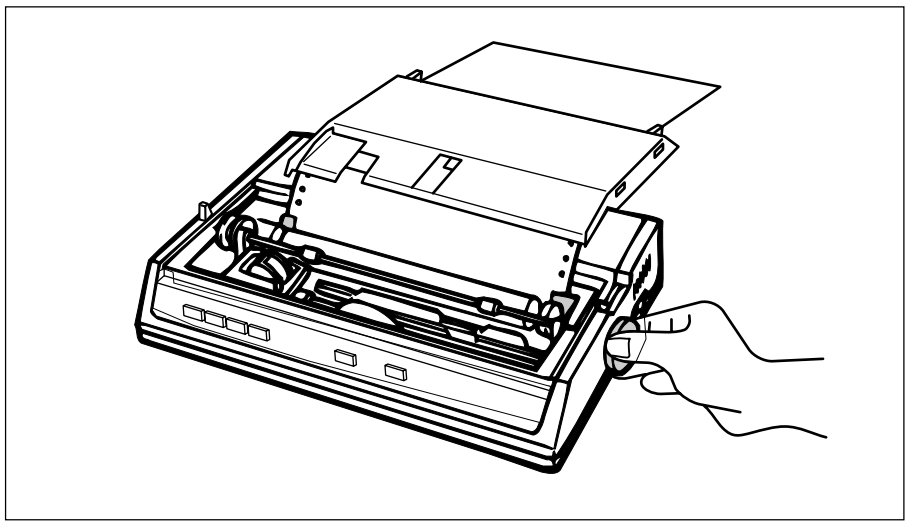
7. Turn the platen knob to advance the paper until it appears in front of the platen.



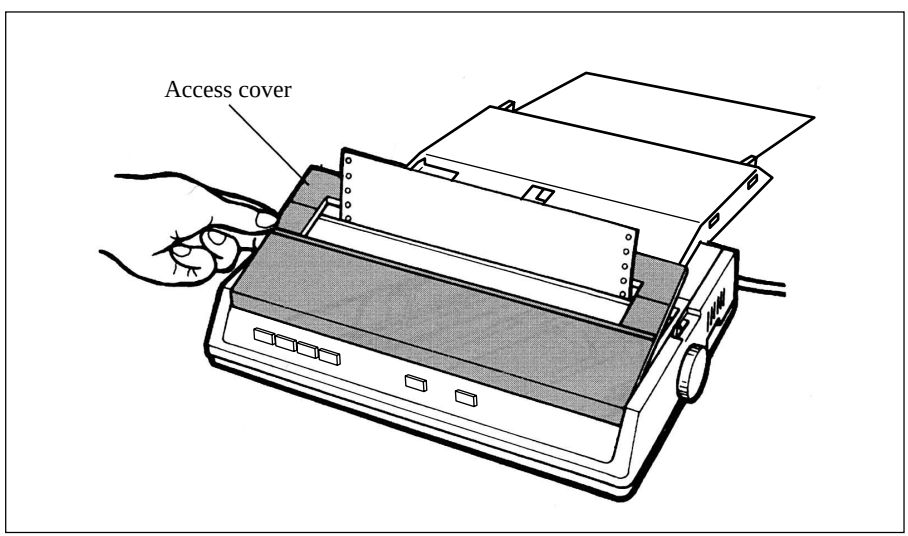
8. Lower the Bail bar.

9. Close the paper release lever.

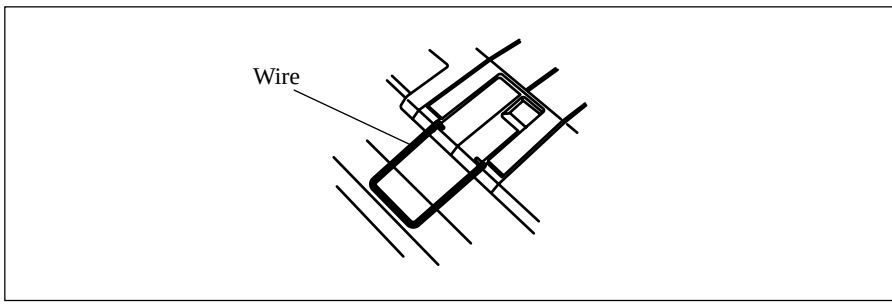
11. Use the platen knob to advance the paper to the first printing line.



12. Replace the access cover.



Note: When the printed paper is involved in the platen, more the wire ahead.



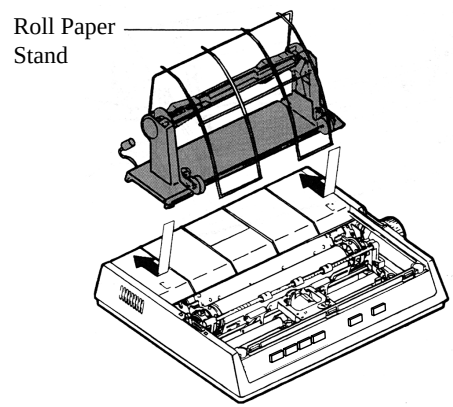
If you adjust the printing position for the set paper by rotating the platen knob in the reverse direction, the printing precision may fluctuate.

Installing and Using the Roll Paper Stand

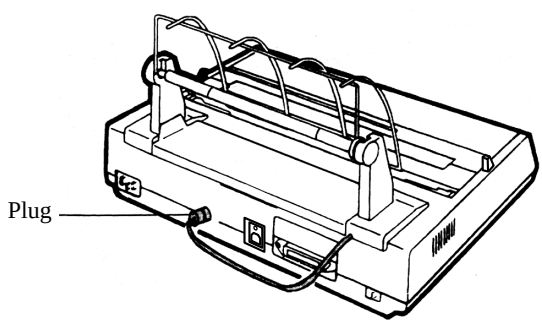
Select “RPS” at the “CSF/RPS Select” menu option.

1. Remove the access cover.

2. Insert the tabs on the roll paper stand into the holes on both sides of the printer.



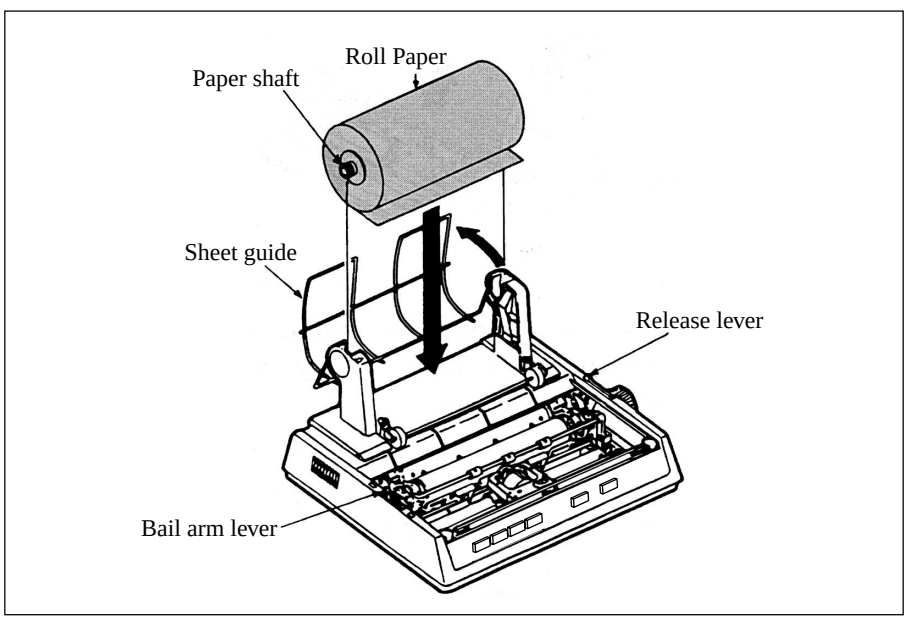
3. Plug the roll paper stand plug into the socket on the rear of the printer.



4. Pull the bail arm lever forwards to move the column indicator away from the platen.

5. Place the paper release lever in the forward (open) position.

6. Insert the paper shaft in the roll paper core, and open the sheet guide of the roll paper stand. Mount the shaft on the stands so that the grooved end of the shaft fits into the groove on the left stand, and the paper rolls from the bottom.

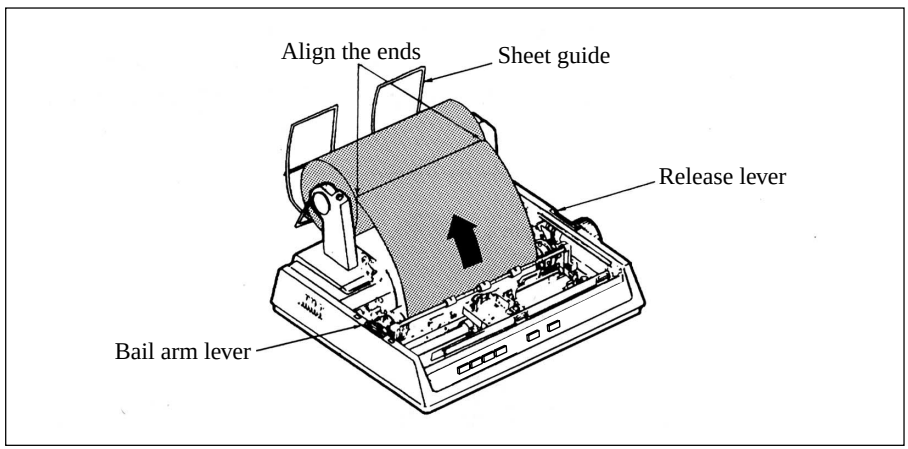


7. Insert the paper from the back of the platen over the paper bar, making sure its edges lie within the platen ends. (The sprocket pins will tear the paper if they come into contact with it.)

8. Push the paper in slightly. Close the paper release lever. Now turn the platen knob to bring the paper to the front of the platen.

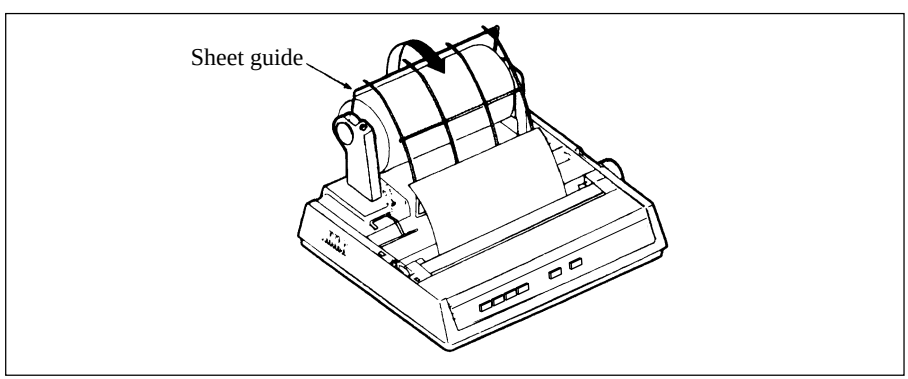
9. Feed the paper supplied to the front of the platen in Step 8 through the slit between the indicator and the platen. If necessary, align the edges of the paper. You must open the paper release lever to do this.

10. Close the bail arm lever.



11. Replace the access cover. Fit the cover tabs into the slots at the printer front. Lower the cover carefully, making sure the paper feeds through the front slot in the access cover.

12. By turning the platen knob, move the paper to the point where you want printing to start. (Many word processing packages automatically allow for a top margin of 25.4 mm (1 inch).



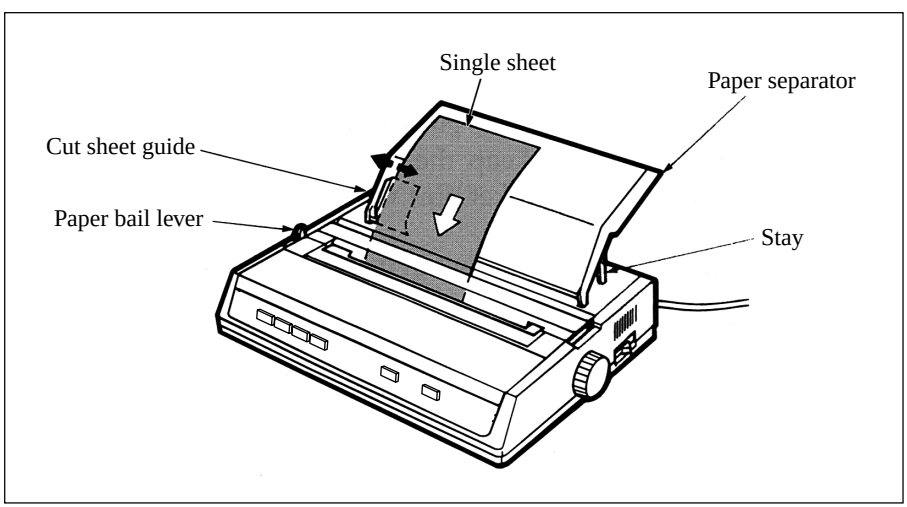
Loading Single Sheets

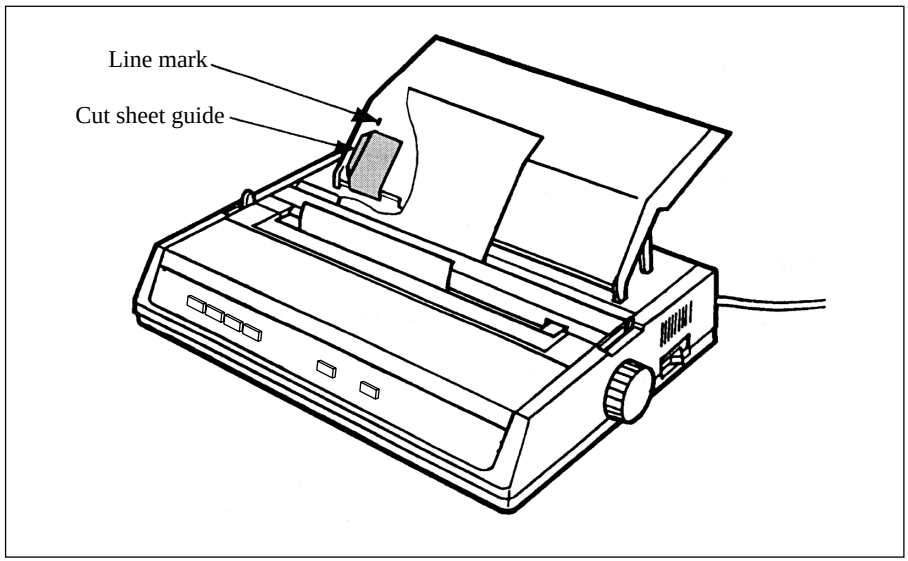
The ML184 Turbo+ can accommodate standard single sheets of 216 by 297 or 355 mm (8.5 by 11-inch or 14-inch) paper. Only one copy, with no carbons, can be printed at a time.

Remove the tractor feed unit and any other accessories before using the paper separator.

Operation

1. Place the paper release lever in its rear (closed) position.
2. Place the printer OFF LINE. (Press the SEL switch.)
3. Close the paper bail lever (Place it in its rearward position.)
4. Raise the paper separator as shown in the figure. (The paper separator remains raised to prevent the paper separator from falling.)
5. Adjust the cut sheet guide on the paper separator to the printing pattern to be used.





Note: When letter-size paper is used, set the cut sheet guide to the line mark on the paper separator then 80-characters (10 CPI) width can be printed in the centre position of the paper.

6. Insert a single sheet along the cut sheet guide until it reaches the pinch roller . Be sure to keep the paper inside the platen ends. Otherwise the built-in sprocket pins will tear it.

7. Open the paper bail lever, place it in its forward position.

8. Close the paper bail lever after confirming that the single sheet has been grasped. Be sure to throw the paper bail lever all the way; otherwise the paper will jam.

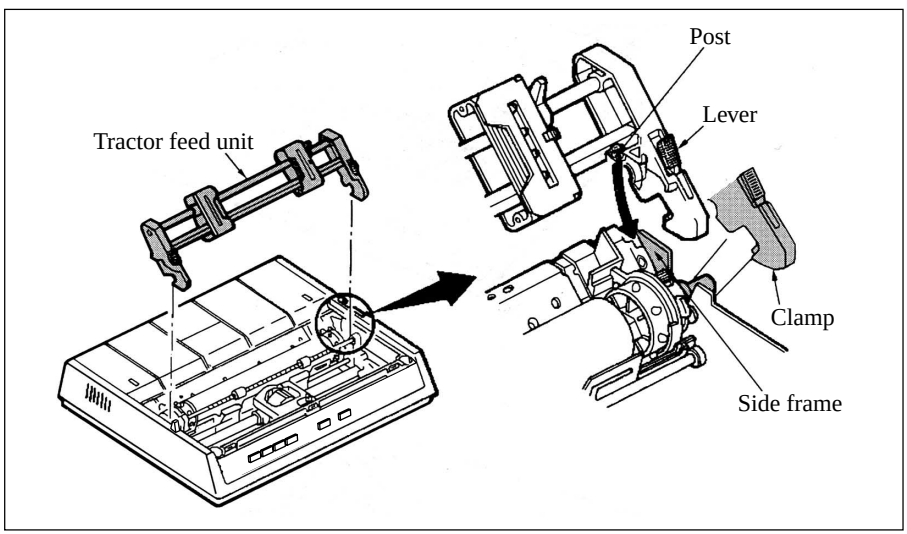
9. Press the SEL key after confirming that the paper is fed again up to the first-line printing position. Then place the printer ON LINE.

Attention: Load paper properly in order for paper to be fed straight.

Installing and Using the Tractor Feed Unit

1. Remove the access cover.

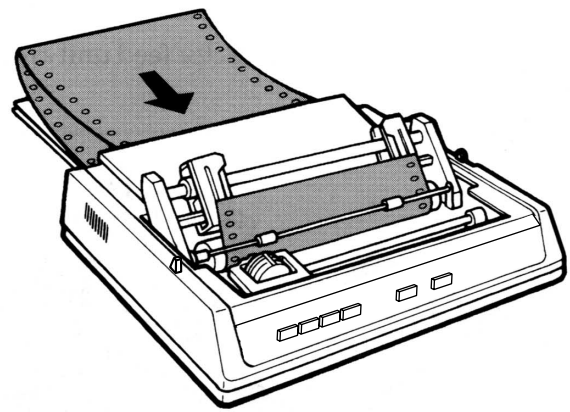
2. Insert the post on each end of the tractor feed unit around the ends of the platen shaft.



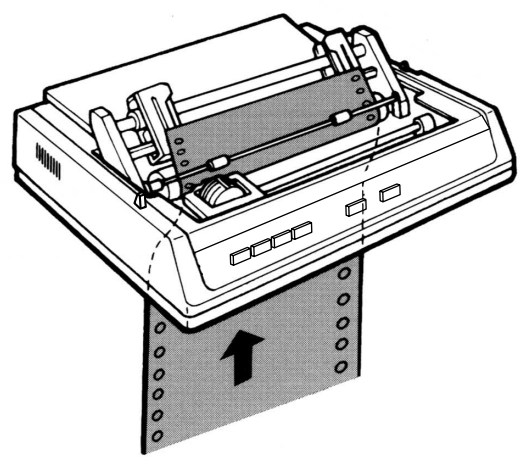
3. Pull the tractor unit forwards until it clamps on to the platen ends.

4. Install the paper separator by placing its hooks in the slots provided on the printer.

5. Paper can be loaded from the top or bottom of the printer. Paper can only be loaded from the bottom if you have a slotted printer stand.

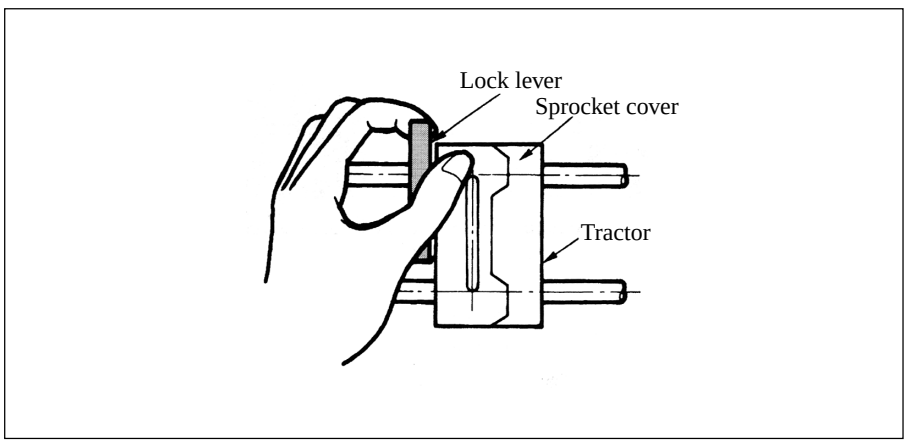


Rear feed



Bottom feed

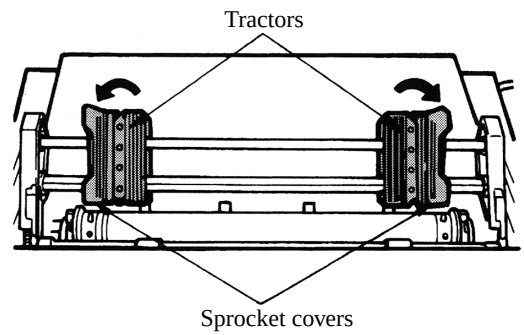
6. Adjust the left tractor if necessary; make sure it is not more than 12.7 mm (1/2 inch) from the left-hand end of the tractor unit. To move the tractor pull the lock lever forwards, slide the tractor to the desired position, then push it backwards to lock it in place.



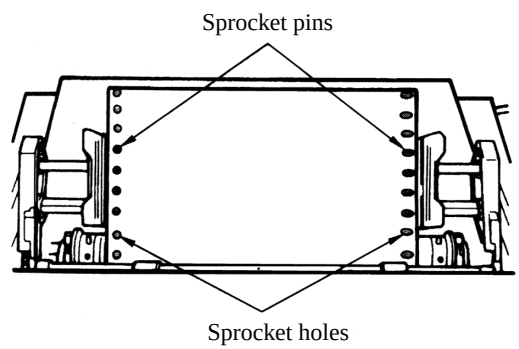
7. Pull the paper under the column indicator and up to the level of the tractor unit.

8. Adjust the right tractor to the paper width by pulling the lock lever forwards, sliding the tractor to the right or left (depending on the paper size), and pushing the lock lever backwards to lock it in place.

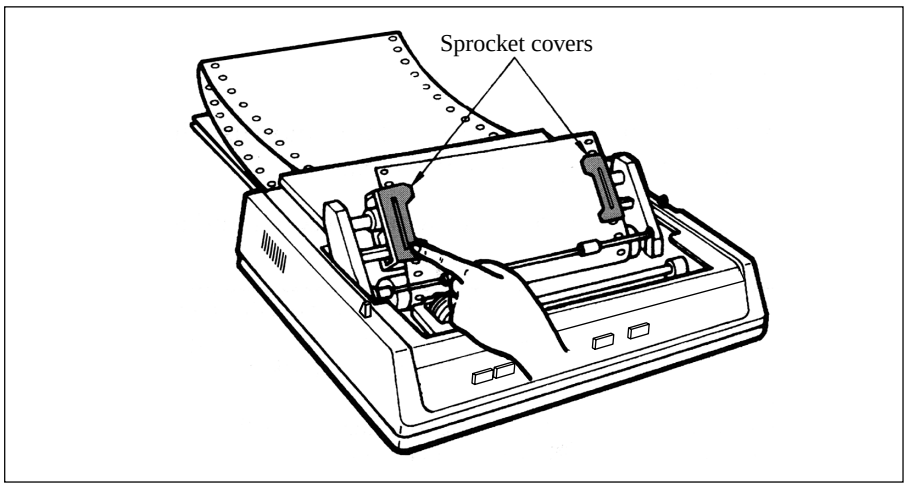
9. Open the sprocket covers and the paper release lever (slide forwards).



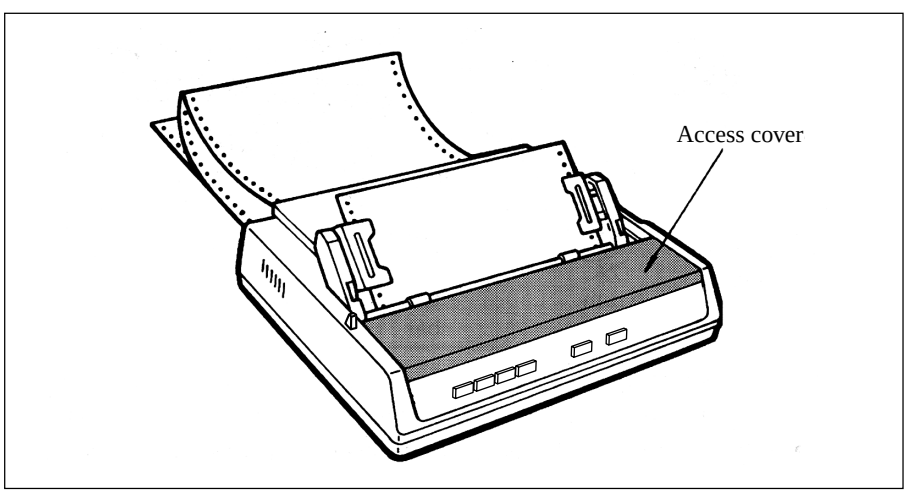
10. Place the sprocket holes in the paper over the sprockets on the tractor unit, making sure that the paper is flat.



11. Close both the sprocket covers. (Leave the paper release lever open.)



12. Put the access cover supplied with the tractor feed unit on the printer.

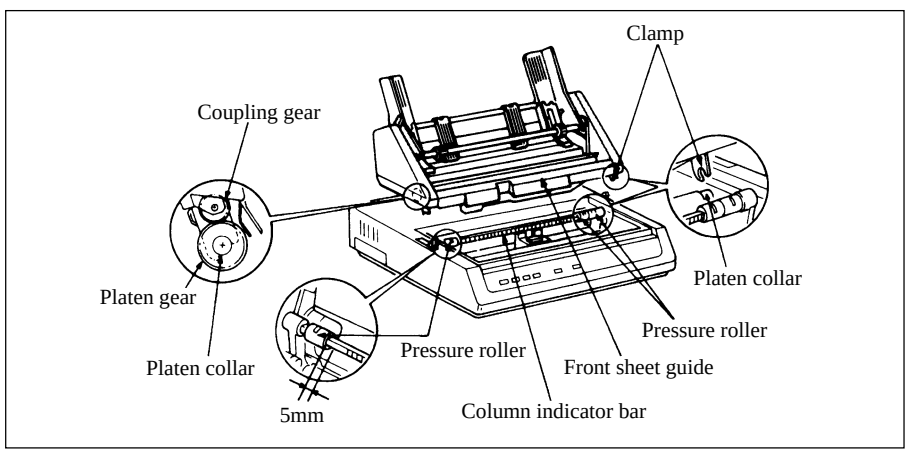


Installation of the Cut-Sheet Feeder

Select “CSF” at the “CSF/RPS Select” menu option.

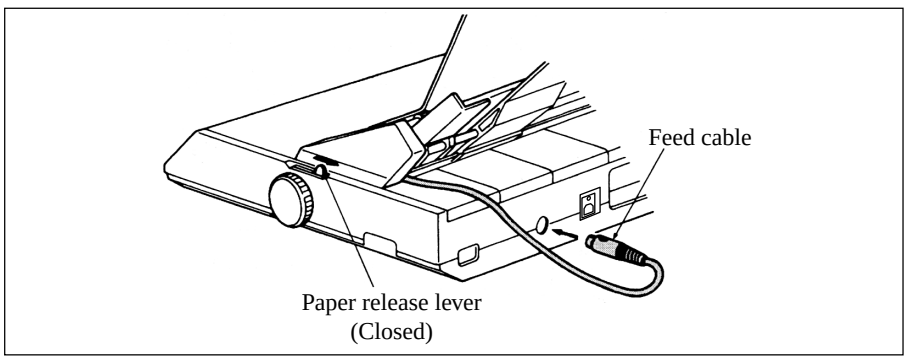
1. Remove the acoustic cover, tractor feed unit, and paper separator if installed.
2. Remove the access cover.
3. Pull the column indicator away from the platen and push the pressure rollers to the left and the right end of the bar.
4. Fit the cut-sheet feeder clamps over the platen collar and lower on to the printer.

Notes: 1. Move the front sheet guide of the cut-sheet feeder under the column indicator. Gently push the front sheet guide towards the platen, then close the column indicator. To engage it with the front sheet guide hook, pull it back to open position.
2. Turn the platen knob to make sure the coupling gear on the left-hand side of the cut-sheet feeder are in line with the platen gear.



5. Insert the sheet supports. Fit the slotted ends of the narrow sheet support on to the square bar and paper chute on to either side of the middle paper guide at the rear of the cut sheet feeder. Slide the front sheet support into the tracks between the feed rollers and the metal plate.

6. Insert the feeder cable into the socket on the rear of the printer. The arrow on the plug faces up.

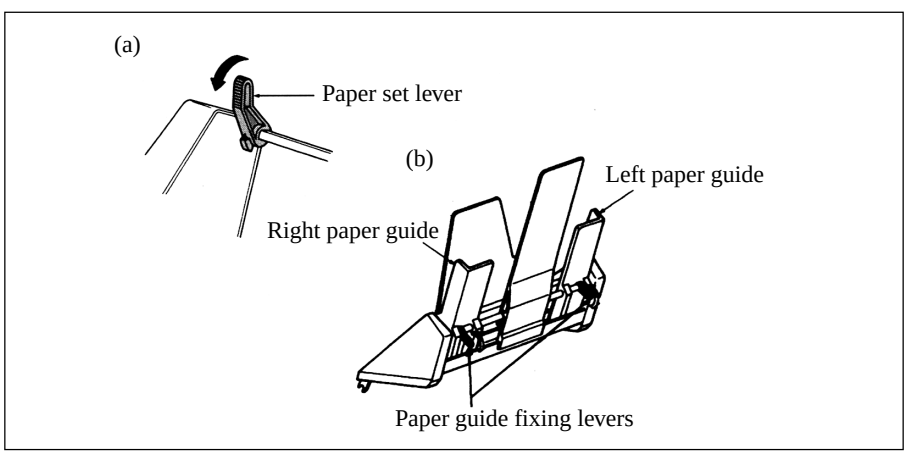


7. Make sure the printer's paper release is closed.

Important: Be sure the paper release lever is closed whenever you are printing with the cut-sheet feeder. If you do not close the paper release, the paper will not feed properly. The printer could print an entire page without any paper, possibly damaging the platen and the print head.

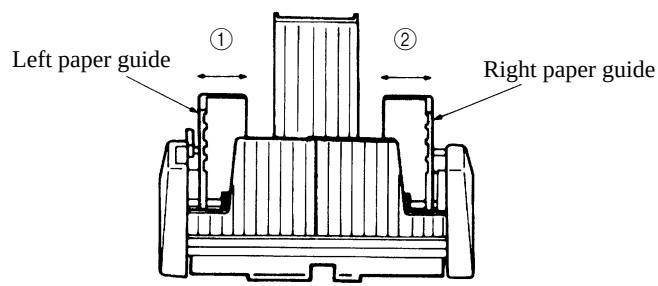
Loading paper into the hopper

1. Put the paper set level to the RESET position.



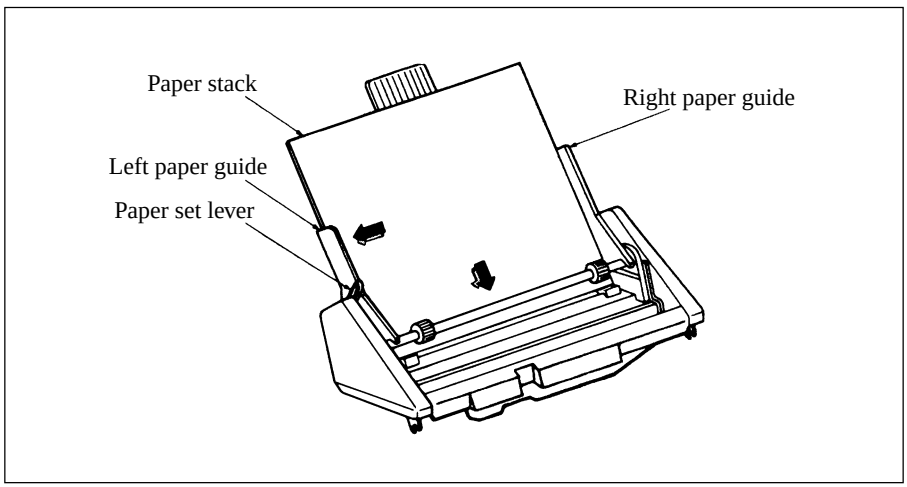
2. Release the paper guides by pushing the fixing levers downwards.

3. Move the left paper guide to the position where you wish to set the left-hand edge of the sheet. Make sure that this guide is not set to the right of the paper out sensor (the groove in the platen).

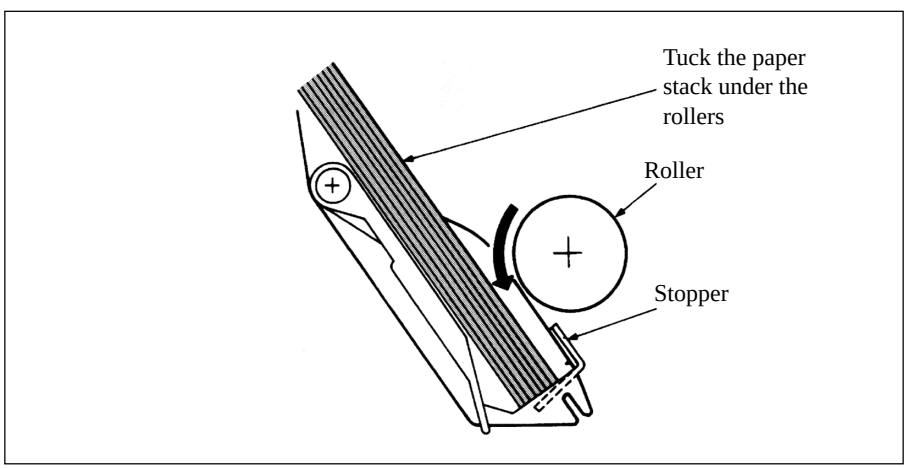


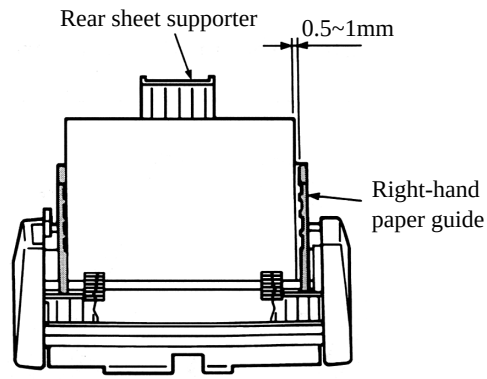
4. Flex the paper stack (not more than 170 sheets of 60g/m^2 (161b) paper). Square the stack again, turn it over, and repeat the bending. The paper stack should not exceed 16mm in total thickness.

5. Insert the paper stack in the hopper, then push it against the left paper guide. Make sure the paper fits under the corner separators. Adjust the right paper guide to the width of the paper.

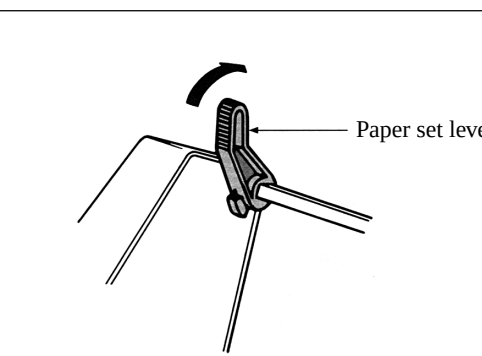


6. Push the paper guide fixing levers upwards into the locked position.



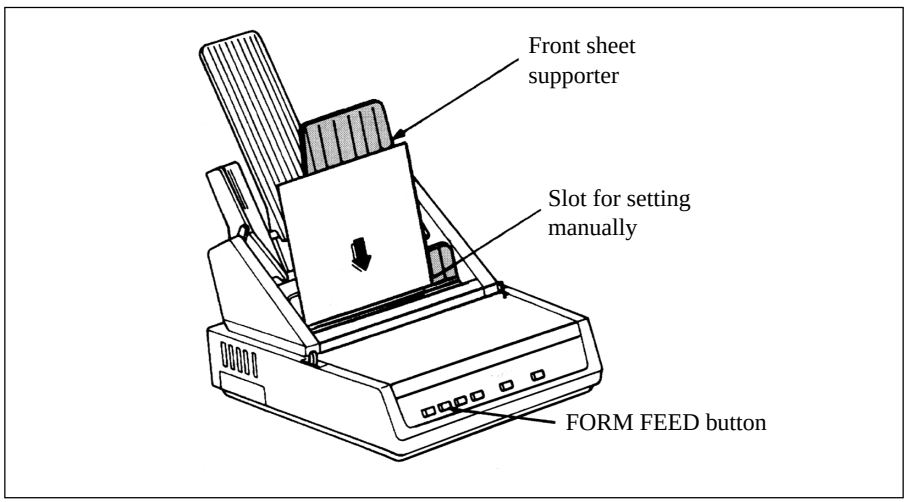


7. Push the paper set lever gently backwards to the set position.



Manual paper loading with the cut-sheet feeder installed.

1. Gently insert the paper from directly above the front sheet support.



2. Use the FORM FEED button to feed the manually loaded paper.

3. Turn the platen knob clockwise/anticlockwise until the sheet is in the desired position.

Notes: 1. The manually set sheet is printed automatically even when other sheets are loaded in the hopper. (When the FORM FEED button is pressed, the manually set sheet will be fed into the cut-sheet feeder.)
2. Do not manually feed paper if a sheet is being fed from the hopper. Simultaneously feeding paper may result in a paper jam.
3. To manually feed a sheet of paper, you must use the FORM FEED button, and use the platen knob to adjust the papers position in the printer. If the paper is being fed manually and is positioned using the platen knob rather than the FORM FEED button it may be ejected just before printing begins.

Cut-sheet feeder controls

The printer's control switches also control the operation of the cut-sheet feeder. The control switches, however, function only when the printer is off-line or deselected (SELECT indicator is not lit).

Printing with the cut-sheet feeder

After the first sheet is inserted and the top of form is set, you can begin printing with the cut-sheet feeder. Simply request a printout from your word processing package as normal. When it receives the PRINT command, the printer starts printing on the inserted sheet until the amount of lines that have been printed according to the appropriate page length, ejects the printed page into the output tray, and inserts a new page. If a file is several pages long, the printer ejects each printed page into the output tray, inserts a new sheet from the hopper, then continues printing.

If you are printing program outputs using the cut sheet feeder, you must include the cut-sheet feeder insert and eject commands. When the printer receives the PRINT command, it inserts a sheet of paper and starts printing. Each time the printer receives the cut-sheet feeder insert command, it ejects the printed sheet then inserts a new sheet. Use the cutsheet feeder eject command at the end of your program if you want the printer to eject the printed sheet without inserting a new sheet. For further information consult the programming section in this handbook.

If you want to eject a sheet of paper you can do it using the FORM FEED button.

Note: Make sure that the page length the printer is set to is no greater than the page length that your word processing system uses.

The action of the LINE FEED button varies according to the status of the cut sheet feeder.

Chapter 3

Working with Software

This chapter covers the fundamentals of setting up commercial software packages for use with your printer. Be sure to read your software documentation carefully for more details.

Basic Terminology

Before we start, let's examine a few terms with which you may not be familiar.

Printer Commands

If you're using commercial software with an appropriate printer driver (see "Printer Drivers" below), the printer commands will normally be sent to the printer by your software and you won't even need to think about them.

Printer commands are signals sent by your PC to the printer which guide and control its operation. Printer commands tell the printer what character pitch to use, what font to use, what margins to use, whether to use single or double spacing, when to engage/disengage double width or double height printing, etc.

Printer commands can be sent in decimal, ASCII, or hexadecimal form. The values (decimal/ASCII/hexadecimal) for each type of command depend on which emulation is active (see Appendix A for a listing of printer commands for each emulation).

With only a few exceptions, printer commands begin with the ESC character, decimal 27 (hexadecimal 1B), which serves as signal to the printer that what follows is to be interpreted as a command rather than just a string of characters. Some printer commands expect you supply a numerical value, representing tab stops, line spacing, etc.

Emulations

In order to eliminate hundreds of different sets of printer commands, most printers emulate, or imitate, one of several general printers; i.e., they accept all of that printer's commands and behave as though they were the emulated printer.

Your printer has three emulations:

- IBM (factory default)
- Epson
- Oki Microline

Printer Drivers

Compatible Printer Drivers (DOS)

Many of the software packages you use will contain drivers 100% compatible with your printer. For older software, however, it may be necessary to select a driver that functions *nearly* the same as a driver specifically designed for your printer. This generally means that you will be selecting a driver that provides commands to access most, but not all of the available functions; however, the commands that are available will perform properly with your printer.

The table below summarizes the various drivers that will work with your printer. They are listed in order by decreasing compatibility as you go down the list: select one from as high up on the list as possible, based on what is available from among the drivers supplied with your software. If you don't see one from near the top of the list, give the software manufacturer a call to see if they have added any drivers to those supplied when you purchased your software. Software manufacturers are constantly updating their lists of drivers to keep up with the printer market and they may very well have one which will give maximum compatibility with your printer.

IBM Emulation	Epson Emulation	OKI ML Emulation
Oki ML 184 Turbo (IBM) Oki ML 320 (IBM) Oki ML 520 (IBM) Oki ML 320 T (IBM) Oki ML 720 (IBM) IBM Graphics printer IBM Proprinter	Oki ML 320 (EPSON) Oki ML 520 (EPSON) Oki ML 320 T (EPSON) Oki ML 720 (EPSON) Epson EX 800 Epson FX	Oki ML 184 Turbo (STD) Oki ML 182 (STD) Oki ML 192 (STD) Oki ML 320 (STD) Oki ML 520 (STD) Oki ML 320 T (STD) Oki ML 720 (STD)

Because there are some differences in characteristics such as speed or access to various features, you may wish to experiment with several different drivers. If you must select a driver that is not listed in the table, be sure to check it thoroughly for print features such as boldface, underline and changes in pitch. Don't be surprised if boldfaced items are printed twice, underlines are misplaced, wide spaces are left between lines or the printer behaves chaotically (turn off the printer if the latter occurs). These are all characteristics of an incompatible driver selection.

Windows Printer Drivers

To use this printer on a Windows operating system, install the Windows printer driver, that is on the Printer Software CD-ROM provided with your printer, on your computer.

For information about which Windows systems are compatible with the printer drivers on the Printer Software CD-ROM and the installation procedure open the Readme file on the Printer Software CD-ROM.

Appendix A

Printer Commands

This appendix contains a listing of the printer commands for the IBM, Epson, and OKI MICROLINE emulations, grouped by function.

IBM Printer Commands

IBM Function	ASCII Code	Decimal Code	Hexadecimal Code
Bar Code Commands			
Select Bar Code Type and Size	ESC DLE A m n_1 n_8	27 16 65 m n_1 n_8	1B 10 41 m n_1 n_8
Print Bar Code Data	ESC DLE B m n [data]	27 16 66 m n [data]	1B 10 42 m n [data]
Print Postnet Bar Code Data	ESC DLE C n [data]	27 16 67 n [data]	1B 10 43 n [data]
Select Bar Code Type	ESC [f L_n H_n P_k P_m P_s L_v H_v P_c	27 91 102 L_n H_n P_k P_m P_s L_v H_v P_c	1B 5B 66 L_n H_n P_k P_m P_s L_v H_v P_c
Print Bar Code	ESC [f L_n H_n DATA	27 91 112 L_n H_n DATA	1B 5B 70 L_n H_n DATA
Character Sets			
Select IBM Character Set I	ESC 7	27 55	1B 37
Select IBM Character Set II	ESC 6	27 54	1B 36
Print from IBM Character Set III	ESC \ L_n H_n	27 92 L_n H_n	1B 5C L_n H_n
Print One Character from IBM Character Set III	ESC n	27 94 n	1B 5E n
Select International Character Set *	ESC ! n	27 33 n	1B 21 n
Select Code Page	ESC [TL_n H_n 0 0 H_{cp} L_{cp} 0	27 91 84 L_n H_n 0 0 H_{cp} L_{cp} 0	1B 5B 54 L_n H_n 0 0 H_{cp} L_{cp} 0
Character Size/Spacing			
Select 10 cpi Pitch	DC2	18	12
Select 12 cpi Pitch	ESC :	27 58	1B 3A
Select 15 cpi Pitch *	ESC g	27 103	1B 67
Select 20 cpi Pitch *	ESC SI	27 15	1B 0F
Set Compressed Pitch	SI	15	0F
Superscript Printing On	ESC S 1	27 83 1	1B 53 01
Subscript Printing On	ESC S 0	27 83 0	1B 53 00
Super script/Subscript	ESC T	27 84	1B 54

IBM Function	ASCII Code	Decimal Code	Hexadecimal Code
Character Size/Spacing (cont.)			
Start Double Width Printing Line by Line	SO	14	0E
End Double Width Printing Line by Line	DC4	20	14
Double Width Printing On	ESC W 1	27 87 1	1B 57 1
Double Width Printing Off	ESC W 0	27 87 0	1B 57 00
Double Width and/or Height Printing On	ESC [@ L_n H_n m_1 m_k	27 91 64 L_n H_n m_1 m_k	1B 5B 40 L_n H_n m_1 m_k
Proportional Spacing On	ESC P1	27 80 1	1B 50 01
Proportional Spacing Off	ESC P0	27 80 0	1B 50 00
Set Intercharacter Spacing *	ESC Vn	27 86 n	1B 56 n
Character Style			
HSD Print Mode On	ESC # 0	27 35 48	1B 23 30
Select Font	ESC I n	27 73 n	1B 49 n
Italics On	ESC % G	27 37 71	1B 25 47
Italics Off	ESC % H	27 37 72	1B 25 48
Emphasized Printing On	ESC E	27 69	1B 45
Emphasized Printing Off	ESC F	27 70	1B 46
Enhanced Printing On	ESC G	27 71	1B 47
Enhanced Printing Off	ESC H	27 72	1B 48
Underline On	ESC - 1	27 45 1	1B 2D 01
Underline Off	ESC - 0	27 45 0	1B 2D 00
Overscore On	ESC 1	27 95 1	1B 5F 01
Overscore Off	ESC 0	27 95 0	1B 5F 00
Select font by Pitch and Point	ESC DEL F P_{n0} P_n L_p H_p	27 16 70 P_{n0} P_n L_p H_p	1B 10 46 P_{n0} P_n L_p H_p
Select Font	ESC [I L_n H_n Hfid Lfid Hfwd Lfwd fa Nul H_c L_c	27 91 73 L_n H_n Hfid Lfid Hfwd Lfwd fa Nul H_c L_c	1B 5B 49 L_n H_n Hfid Lfid Hfwd Lfwd fa Nul H_c L_c
Select Print Quality	ESC [d L_n H_n P_n	27 91 100 L_n H_n P_n	1B 5B 64 L_n H_n P_n
Custom Characters			
Down Line Load Characters	ESC = c_1 c_2 m n a_1 a_2 d_1 d_k	27 61 c_1 c_2 m n a_1 a_2 d_1 d_k	1B 3D c_1 c_2 m n a_1 a_2 d_1 d_k
Copy ROM Character Set to RAM Character Set *	ESC $	27 36	1B 24
Cut-Sheet Feeder Control			
Insert/Eject Paper *	ESC EM n	27 25 n	1B 19 n

IBM Function	ASCII Code	Decimal Code	Hexadecimal Code
Graphics			
Single Density Graphics	ESC K L_n H_n [data]	27 75 L_n H_n [data]	1B 4B L_n H_n [data]
Double Density Graphics	ESC L L_n H_n [data]	27 76 L_n H_n [data]	1B 4C L_n H_n [data]
Double Speed/Double Density Graphics	ESC Y L_n H_n [data]	27 89 L_n H_n [data]	1B 59 L_n H_n [data]
Quadruple Density Graphics	ESC Z L_n H_n [data]	27 90 L_n H_n [data]	1B 5A L_n H_n [data]
Horizontal Control			
Backspace	BS	8	08
Carriage Return	CR	13	0D
Margin Setting, Left & Right	ESC X n m	27 88 n m	1B 58 n m
Horizontal Tab	HT	9	09
Set Horizontal Tab	ESC D n_1 n_2 n_k 0	27 68 n_1 n_2 n_k 0	1B 44 n_1 n_2 n_k 0
Clear Horizontal Tab Settings	ESC D 0 0	27 68 0 0	1B 44 0 0
Set 4-column Tabulation *	ESC % B n_1 n_2 n_3 n_4	27 37 66 n_1 n_2 n_3 n_4	1B 25 42 n_1 n_2 n_3 n_4
Set Print Position *	ESC DLE @ P_n A_1 A_2 P_1 P_2 P_3 P_4	27 16 64 P_n A_1 A_2 P_1 P_2 P_3 P_4	1B 10 40 P_n A_1 A_2 P_1 P_2 P_3 P_4
Set Relative Dot Position *	ESC \ L_n H_n	27 124 L_n H_n	1B 7C L_n H_n
Uni-directional Print On	ESC U 1	27 85 1	1B 55 1
Uni-directional Print Off	ESC U 0	27 85 0	1B 55 00
Set Relative Print Position	ESC d L_n H_n	27 100 L_n H_n	1B 64 L_n H_n
Vertical Control			
Page Length, Set in n Inches	ESC C 0 n	27 67 0 n	1B 43 00 n
Page Length, Set in Lines	ESC C n	27 67 n	1B 43 n
Skip Over Perforation On	ESC N n	27 78 n	1B 4E n
Skip Over Perforation Off	ESC O	27 79	1B 4F
Set Top of Form at Current Position	ESC 4	27 52	1B 34
Form Feed	FF	12	0C
Line Feed	LF	10	0A
Perform $^n/_{216}$" Line Feed	ESC J n	27 74 n	1B 4A n
Perform $^n/_{144}$" Line Feed	ESC % 5 n	27 37 53 n	1B 25 35 n
Auto Line Feed On	ESC 5 1	27 53 1	1B 35 01
Auto Line Feed Off	ESC 5 0	27 53 0	1B 35 00
Set Line Spacing to $^7/_{72}$"	ESC 1	27 49	1B 31
Set Line Spacing to $^1/_8$"	ESC 0	27 48	1B 30

IBM Function	ASCII Code	Decimal Code	Hexadecimal Code
Vertical Control (cont.)			
Set Line Spacing to $^{n}/_{216}$"	ESC 3 n	27 51 n	1B 33 n
Set Line Spacing to $^{7}/_{144}$"*	ESC % 9 n	27 35 57 n	1B 25 39 n
Set Line Spacing to $^{n}/_{72}$"	ESC A n	27 65 n	1B 41 n
Line feed compound command	ESC DLE H Pno A1 A2 P1 P2 P3	27 16 72 Pno A1 A2 P1 P2 P3	1B 10 48 Pno A1 A2 P1 P2 P3
Perform Line Feed Set by	ESC 2	27 50	1B 32
ESC A n Command			
Vertical Tab	VT	11	0B
Set Vertical Tab	ESC B n_1 n_2 n_k 0	27 66 n_1 n_2 n_k 0	1B 42 n_1 n_2 n_k 0
Reset Vertical Tab to Defaults	ESC R	27 82	1B 52
Miscellaneous			
Cancel	CAN	24	18
Change Emulation *	ESC { n	27 123 n	1B 7B n
Paper-Out Sensor On	ESC 8	27 56	1B 38
Paper-Out Sensor Off	ESC 9	27 57	1B 39
Print Suppress Mode On	ESC Q STX	27 81 2	1B 51 02
Print Suppress Mode Off (either Model)	DC1	17	11
Set Initial Conditions	ESC [K L_n H_n Init Id a_1 a_2	27 91 75 L_n H_n Init Id a_1 a_2	1B 5B 4BL_n H_n Init Id a_1 a_2
Software I-Prime *	ESC } 0	27 125 0	1B 7D 00
Stop Printing	ESC j	27 106	

* OKI-Unique command

Epson Printer Commands

Epson Function	ASCII Code	Decimal Code	Hexadecimal Code
Bar Code Commands			
Select Bar Code Type and Size *	ESC DLE A m n_1 n_8	27 16 65 m n_1 n_8	1B 10 41 m n_1 n_8
Print Bar Code Data *	ESC DLE B m n [data]	27 16 66 m n [data]	1B 10 42 m n [data]
Print Postnet Bar Code Data *	ESC DLE C n [data]	27 16 67 n [data]	1B 10 43 n [data]
Print Bar Code	ESC (B Ln Hn Pk Pm Ps Lv Hv Pc DATA	27 40 66 Ln Hn Pk Pm Ps Lv Hv Pc DATA	1B 28 42 Ln Hn Pk Pm Ps Lv Hv Pc DATA
Character Sets			
Select International Character Set	ESC R n	27 82 n	1B 52 n
Select Epson Character Set	ESC t n	27 116 n	1B 74 n
Permit Printing of Upper Range Control Codes	ESC 6 or ESC I 1	27 54 or 27 73 1	1B 36 or 1B 49 01
Cancel Printing of Upper Range Control Codes	ESC 7 or ESC I 0	27 55 or 27 73 0	1B 37 or 1B 49 00
Character table selection	ESC (t Ln Hn Pn1 Pn2 Pn3	27 40 116 Ln Hn Pn1 Pn2 Pn3	1B 28 74 Ln Hn Pn1 Pn2 Pn3
Character Size/Spacing			
Select 10 cpi Pitch	ESC P	27 80	1B 50
Select 12 cpi Pitch	ESC M	27 77	1B 4D
Select 15 cpi Pitch	ESC g	27 103	1B 67
Select 20 cpi Pitch	ESC SI	27 15	1B 0F
Cancel 20 cpi Pitch	DC2	18	12
Set Compressed Pitch	SI	15	0F
Superscript Printing On	ESC S 1	27 83 1	1B 53 01
Subscript Printing On	ESC S 0	27 83 0	1B 53 00
Superscript/Subscript Printing Off	ESC T	27 84	1B 54
Begin Double Width Printing Line by Line	ESC SO	27 14	1B 0E
End Double Width Printing Line by Line	DC 4	20	14
Double Width Printing On	ESC W 1	27 87 1	1B 57 01
Double Width Printing Off	ESC W 0	27 87 0	1B 57 00

Epson Function	ASCII Code	Decimal Code	Hexadecimal Code
Character Size/Spacing (cont.)			
Double Height Printing On	ESC w n	27 119 n	1B 77 n
Proportional Spacing On	ESC p 1	27 112 1	1B 70 01
Proportional Spacing Off	ESC p 0	27 112 0	1B 70 00
Set Intercharacter Spacing	ESC SP n	27 32 n	1B 20 n
Character Style			
Select HSD Print Mode *	ESC (n	27 40 n	1B 28 n
Select Utility or NLQ Print Mode	ESC x n	27 120 n	1B 78 n
Select Draft Font	ESC y Pn	27 40 85 Pn	1B 28 55 Pn
Select font by Pitch and Point	ESC X Pn Lp Hp	27 88 Pn Lp Hp	1B 58 Pn Lp Hp
Select NLQ Type	ESC k n	27 107 n	1B 6B n
Composite Command	ESC ! n	27 33 n	1B 21 n
Italics On	ESC 4	27 52	1B 34
Italics Off	ESC 5	27 53	1B 35
Emphasized Printing On	ESC E	27 69	1B 45
Emphasized Printing Off	ESC F	27 70	1B 46
Enhanced Printing On	ESC G	27 71	1B 47
Enhanced Printing Off	ESC H	27 72	1B 48
Underline On	ESC - 1	27 45 1	1B 2D 01
Underline Off	ESC - 0	27 45 0	1B 2D 00
Custom Characters			
Down Line Load Custom Characters	ESC & 0 n_1 n_2 a [data]	27 38 0 n_1 n_2 a [data]	1B 26 00 n_1 n_2 a [data]
Copy ROM Character Set to RAM Character Set	ESC : 0 n 0	27 58 0 n 0	1B 3A 0 n 0
Custom Character Set On	ESC % 0	27 37 0	1B 25 00
Custom Character Set Off	ESC % 1	27 37 1	1B 25 01
Cut Sheet Feeder Control			
Insert/Eject Paper	ESC EM n	27 25 n	1B 19 n
Graphics			
Single Density Graphics	ESC K L_n H_n [data]	27 75 L_n H_n [data]	1B 4B L_n H_n [data]
Double Density Graphics	ESC L L_n H_n [data]	27 76 L_n H_n [data]	1B 4C L_n H_n [data]
Double Speed/Double Density Graphics	ESC Y L_n H_n [data]	27 89 L_n H_n [data]	1B 59 L_n H_n [data]
Quadruple Density Graphics	ESC Z L_n H_n [data]	27 90 L_n H_n [data]	1B 5A L_n H_n [data]

Epson Function	ASCII Code	Decimal Code	Hexadecimal Code
Graphics (cont.)			
Graphics Select/Print	ESC * m L_n H_n [data]	27 42 m L_n H_n [data]	1B 2A m L_n H_n [data]
Reassign Graphics	ESC ? m n	27 63 m n	1B 3F m n
Select 9-pin Graphics Printing	ESC m L_n H_n [data]	27 94 m L_n H_n [data]	1B 5E m L_n H_n [data]
Horizontal Control			
Backspace	BS	8	08
Carriage Return	CR	13	0D
Margin Setting, Left	ESC l n	27 108 n	1B 6C n
Margin Setting, Right	ESC Q n	27 81 n	1B 51 n
Horizontal Tab	HT	9	09
Set Horizontal Tab	ESC D n_1 n_2 n_k 0	27 68 n_1 n_2 n_k 0	1B 44 n_1 n_2 n_k 00
Clear Horizontal Tab Settings	ESC D 0 0	27 68 0 0	1B 44 00 00
Set Print Position	ESC DLE @ P_n A_1 A_2 P_1 P_2 P_3 P_4	27 16 64 P_n A_1 A_2 P_1 P_2 P_3 P_4	1B 10 40 P_n A_1 A_2 P_1 P_2 P_3 P_4
Set Absolute Dot Position	ESC $ L_n H_n	27 36 L_n H_n	1B 24 L_n H_n
Set Relative Dot Position	ESC \ L_n H_n	27 92 L_n H_n	1B 5C L_n H_n
Uni-directional Print On	ESC U 1	27 85 1	1B 55 01
Uni-directional Print Off	ESC U 0	27 85 0	1B 55 00
Print Uni-directional for One Line	ESC <	27 60	1B 3C
Vertical Control			
Page Length, Set in n Inches	ESC C 0 n	27 67 0 n	1B 43 00 n
Page Length, Set in Lines	ESC C n	27 67 n	1B 43 n
Skip Over Perforation Set	ESC N n	27 78 n	1B 4E n
Skip Over Perforation Reset to Default	ESC O	27 79	1B 4F
Form Feed	FF	12	0C
Line Feed	LF	10	0A
Perform $n/216$" Line Feed	ESC J n	27 74 n	1B 4A n
Perform $n/144$" Line Feed *	ESC % 5 n	27 37 53 n	1B 25 35 n
Set Line Spacing to $1/6$"	ESC 2	27 50	1B 32
Set Line Spacing to $1/8$"	ESC 0	27 48	1B 30
Set Line Spacing to $7/72$"	ESC 1	27 49	1B 31
Set Line Spacing to $n/72$"	ESC A n	27 65 n	1B 41 n
Set Line Spacing to $n/144$" *	ESC % 9 n	27 37 57 n	1B 25 39 n

Epson Function	ASCII Code	Decimal Code	Hexadecimal Code
Vertical Control (cont.)			
Set Line Spacing to $^{n}/_{216}$"	ESC 3 n	27 51 n	1B 33 n
Vertical Tab	VT	11	0B
Set Vertical Tab Stops	ESC B n_1 n_2 n_k 0	27 66 n_1 n_2 n_k 0	1B 42 n_1 n_2 n_k 00
Line feed compound command	ESC DLE H Pno A1 A2 P1 P2 P3	27 16 72 Pno A1 A2 P1 P2 P3	1B 10 48 Pno A1 A2 P1 P2 P3
Reset Vertical Tab to Defaults	ESC B 0	27 66 0	1B 42 00
Set Vertical Format Unit (VFU)	ESC b m n_1 n_2 n_k 0	27 98 m n_1 n_2 n_k 0	1B 62 m n_1 n_2 n_k 0
Set Vertical Tab Channel	ESC/n	27 47 n	1B 2Fn
Set Basic Unit	ESC (U Ln Hn Pn	27 40 85 Ln Hn Pn	1B 28 55 Ln Hn Pn
Set Page Length in Defined Unit	ESC (C Ln Hn Lp Hp	27 40 67 C Ln Hn Lp Hp	1B 28 43 C Ln Hn Lp Hp
Set Page Format	ESC (c Ln Hn Lt Ht Lb Hb	27 40 99 Ln Hn Lt Ht Lb Hb	1B 28 63 Ln Hn Lt Ht Lb Hb
Miscellaneous			
Cancel	CAN	24	18
Change Emulation *	ESC { n	27 123 n	1B 7B n
Delete One Character	DEL	127	7F
Initialize Printer	ESC @	27 64	1B 40
Half-Speed Printing On	ESC s 1	27 115 1	1B 73 0
Half-Speed Printing Off	ESC s 0	27 115 0	1B 73 00
Paper-Out Sensor On *	ESC 9	27 57	1B 39
Paper-Out Sensor Off *	ESC 8	27 56	1B 38
Print Suppress Mode On	DC3	19	13
Print Suppress Mode Off	DC1	17	11
Set Most Significant Bit to Zero	ESC =	27 61	1B 3D
Set Most Significant Bit to One	ESC >	27 62	1B 3E
Cancel Most Significant Bit Control	ESC #	27 35	1B 23
Software I-Prime *	ESC } 0	27 125 0	1B 7D 00
Justification			
Left Justification	ESC a 0	27 97 0	1B 61 00
Center Justification	ESC a 1	27 97 1	1B 61 01
Right Justification	ESC a 2	27 97 2	1B 61 02
Within Line Justification	ESC a 3	27 97 3	1B 61 03

* OKI-Unique Command

OKI Microline (ML) Printer Commands

Microline Function	ASCII Code	Decimal Code	Hexadecimal Code
Bar Code Commands			
Select Bar Code Type and Size	ESC DLE A m n_1 n_8	27 16 65 m n_1 n_8	1B 10 41 m n_1 n_8
Print Bar Code Data	ESC DLE B n [data]	27 16 66 n [data]	1B 10 42 n [data]
Print Postnet Bar Code Data	ESC DLE C n [data]	27 16 67 n [data]	1B 10 43 n [data]
Character Sets			
Select Standard Character Set	ESC ! 0	27 33 48	1B 21 30
Select Line Character Set (comparable to IBM Set 2)	ESC ! 2	27 33 50	1B 21 32
Block character set	ESC ! 1	27 33 49	1B 21 31
Select International Character Set	ESC ! n	27 33 n	1B 21 n
Select Code Page	ESC [T L_n H_n 0 0 H_{cp} L_{cp} 0	27 91 84 L_n H_n 0 0 H_{cp} L_{cp} 0	1B 5B 54 L_n H_n 0 0 H_{cp} L_{cp} 0
Character Size/Spacing			
Select 10 cpi Pitch	RS	30	1E
Select 12 cpi Pitch	FS	28	1C
Select 15 cpi Pitch	ESC g	27 103	1B 67
Select 17.1 cpi Pitch	GS	29	1D
Select 20 cpi Pitch	ESC # 3	27 35 51	1B 23 33
Superscript Printing On	ESC J	27 74	1B 4A
Superscript Printing Off	ESC K	27 75	1B 4B
Subscript Printing On	ESC L	27 76	1B 4C
Subscript Printing Off	ESC M	27 77	1B 4D
Double Width Printing	US	31	1F
Double Height Printing On	ESC US 1	27 31 49	1B 1F 31
Double Height Printing Off	ESC US 0	27 31 48	1B 1F 30
Select Print Mode	ESC & n_1 n_2 n_3 n_4 :	27 38 n_1 n_2 n_3 n_4 58	1B 26 n_1 n_2 n_3 n_4 3A
Proportional Spacing On	ESC Y	27 89	1B 59
Proportional Spacing Off	ESC Z	27 90	1B 5A
Set Intercharacter Spacing	ESC N n	27 78 n	1B 4E n

Microline Function	ASCII Code	Decimal Code	Hexadecimal Code
Character Style			
HSD Print Mode On	ESC # 0	27 35 48	1B 23 30
Select Utility Print Mode	ESC 0	27 48	1B 30
Select NLQ Courier Font	ESC 1	27 49	1B 31
Select NLQ Gothic Font	ESC 3	27 51	1B 33
Select Font by Pitch and Point	ESC DLE F Pn_0 Pn Lp Hp	27 16 70 Pn_0 Pn Lp Hp	1B 10 46 Pn_0 Pn Lp Hp
Italics On	ESC ! /	27 33 47	1B 21 2F
Italics Off	ESC ! *	27 33 42	1B 21 2A
Emphasized Printing On	ESC T	27 84	1B 54
Enhanced Printing On	ESC H	27 72	1B 48
Emphasized and Enhanced Printing Off	ESC I	27 73	1B 49
Underline On	ESC C	27 67	1B 43
Underline Off	ESC D	27 68	1B 44
Custom Characters			
Copy ROM Character Set to RAM Character Set	ESC $	27 36	1B 24
Download Custom Ascender Characters	ESC % A m n_1 n_{11}	27 37 65 m n_1 n_{11}	1B 25 41 m n_1 n_{11}
Download Custom Descender Characters	ESC % D m n_1 n_{11}	27 37 68 m n_1 n_{11}	1B 25 44 m n_1 n_{11}
Select DLL Utility Character Font	ESC 2	27 50	1B 32
Select Down Line Load NLQ Character Font	ESC 7	27 55	1B 37
Cut Sheet Feeder Control			
Cut Sheet Feeder Insert Sheet	ESC S	27 83	1B 53
Cut Sheet Feeder Sheet Eject	ESC V	27 86	1B 56
Cut Sheet Feeder Bin 1 or Bin 2 Selection	ESC EM n	27 25 n	1B 19 n
Graphics			
Single Density Graphics	ESC P or ESC Q	27 80 or 27 81	1B 50 or 1B 51
Double Density Graphics	ESC R	27 82	1B 52
Double Speed/Quadruple Density Graphics	ESC # Q	27 35 81	1B 23 51

Microline Function	ASCII Code	Decimal Code	Hexadecimal Code
Graphics (cont.)			
Graphics Mode Selection	ESC * n_1 n_2 :	27 42 n_1 n_2 58	1B 2A n_1 n_2 3A
Graphics Print Mode Selection	ETX	3	03
Horizontal Control			
Backspace	BS	8	08
Carriage Return	CR	13	0D
Horizontal Tab	HT	9	09
Margin Setting, Left	ESC % C n_1 n_2 n_3	27 37 67 n_1 n_2 n_3	1B 25 43 n_1 n_2 n_3
Margin Setting, Right	ESC % R n_1 n_2 n_3 n_4	27 37 82 n_1 n_2 n_3 n_4	1B 25 52 n_1 n_2 n_3 n_4
Move to the Left	ESC % F n_1 n_2 n_3 n_4	27 37 70 n_1 n_2 n_3 n_4	1B 25 46 n_1 n_2 n_3 n_4
Move to the Right	ESC % E n_1 n_2 n_3 n_4	27 37 69 n_1 n_2 n_3 n_4	1B 25 45 n_1 n_2 n_3 n_4
Set Print Position	ESC % B n_1 n_2 n_3 n_4	27 37 66 n_1 n_2 n_3 n_4	1B 25 42 n_1 n_2 n_3 n_4
Set Multiple Print Positions	ESC DEL @ P_n a_1 a_2 P_1 P_2 P_3 P_4	27 16 64 P_n a_1 a_2 P_1 P_2 P_3 P_4	1B 10 40 P_n a_1 a_2 P_1 P_2 P_3 P_4
Set Horizontal Tab by Characters	ESC HT x y z CR	27 9 x y z 13	1B 09 x y z 0D
Set Horizontal Tab by Dot Columns	ESC HTX x y z w CR	27 3 x y z w 13	1B 03 x y z w 0D
Uni-directional Print On	ESC -	27 45	1B 2D
Uni-directional Print Off	ESC =	27 61	1B 3D
Vertical Control			
Page Length, Set in $^1/_2$" Increments	ESC G H_n L_n	27 71 H_n L_n	1B 47 H_n L_n
Page Length, Set in Lines	ESC F H_n L_n	27 70 H_n L_n	1B 46 H_n L_n
Skip Over Perforation On	ESC % S n	27 37 83 n	1B 25 53 n
Skip Over Perforation Off	ESC % S 0	27 37 83 0	1B 25 53 00
Set Top of Form	ESC 5	27 53	1B 35
Form Feed	FF	12	0C
Skip Down Selected Number of Lines	ESC VT H_n L_n	27 11 H_n L_n	1B 0B H_n L_n
Line Feed (with Carriage Return)	LF	10	0A
Line Feed (without Carriage Return)	ESC DC2	27 18	1B 12
Carriage Return/Line Feed Selection Command	ESC ? n :	25 63 n 58	1B 3F n 3A

Microline Function	ASCII Code	Decimal Code	Hexadecimal Code
Vertical Control (cont.)			
Perform $^{n}/_{144}$" Line Feed	ESC % 5 n	27 37 53 n	1B 25 35 n
Set Line Spacing to $^{1}/_{8}$"	ESC 8	27 56	1B 38
Set Line Spacing to $^{1}/_{6}$"	ESC 6	27 54	1B 36
Set Line Spacing to $^{n}/_{144}$"	ESC % 9 n	27 37 57 n	1B 25 39 n
Vertical Tab	VT	11	0B
Execute VFU Vertical Tab	VT n	11 n	0B n
Set Vertical Tab Channels	DC4 SP SP n SP SP?	20 32 32 n 32 32 63	14 20 20 n 20 20 3F
Line feed compound command	ESC DLE H Pno A1 A2 P1 P2 P3	27 16 72 Pno A1 A2 P1 P2 P3	1B 10 48 Pno A1 A2 P1 P2 P3
Miscellaneous			
Cancel	CAN	24	18
Initialize Printer	ESC CAN	27 24	1B 18
Half-Speed Printing On	ESC <	27 60	1B 3C
Half-Speed Printing Off	ESC >	27 62	1B 3E
Change Emulation	ESC { n	27 123 n	1B 7B n
Paper-Out Sensor On	ESC E 0	27 69 0	1B 45 00
Paper-Out Sensor Off	ESC E 1	27 69 1	1B 45 01
Print Suppress Mode On	DC3	19	13
Print Suppress Mode Off	DC1	17	11
Software I-Prime	ESC } 0	27 125 0	1B 7D 00

Appendix B

Interface Cable

Cables and Connectors

This appendix is designed to help you make a cable to connect your printer to your computer. Please do not attempt to make a cable unless you have experience in doing so. In this section we explain the signals from the printer end; you should read your computer documentation to determine the requirements at the computer end.

Parallel Cable

The Microline 184 Turbo requires a Centronics-equivalent parallel cable with the following:

- Amphenol 57-30360 or AMP 552274-1 plug (or equivalent) with 36 pins.
- AMP 552073-1 (or equivalent) cover.
- Beldon (or equivalent) shielded cable, maximum 1.8 metres with twisted-pair conductors. It must be UL and CSA (equivalent to European standards) approved.
- The printer has a 36-pin receptacle, Amphenol57-40360-12-D56, built into the back.

The wiring requirements are detailed in the following tables.

Pin#	Signal	Return Pin#	Direction	Description
1	$\overline{\text{Data Strobe}}$	19	To printer	Strobe pulse to read data in. Pulse width must be more than 0.5 tis at receiving terminal. The signal level is normally high; read-in of data is performed at the low level of this signal.
2	Data 1	20	To printer	These signals represent information in the 1st to 8th bits of parallel data respectively. Each signal is at high level when data is logical 1 and low when logical 0.
3	Data 2	21	To printer	
4	Data 3	22	To printer	
5	Data 4	23	To printer	
6	Data 5	24	To printer	
7	Data 6	25	To printer	
8	Data 7	26	To printer	
9	Data 8	27	To printer	
10	$\overline{\text{ACKNOWLEDGE}}$	28	From printer	Approximately 2~8µs low pulse. Low indicates that data has been received and that printer is now ready to accept other data.
11	Busy	29	From printer	A high signal indicates that the printer cannot receive data. The signal becomes high in the following cases: 1. During data entry 2. During printing 3. In off-line state 4. During printer error state.
12	Paper End	30	From printer	A high signal indicates that the printer is out of paper.
13	Select	No return	From printer	This signal indicates that the printer is ready to receive data.

Pin#	Signal	Return Pin#	Direction	Description
14	$\overline{\text{Auto feed}}$	No return	To printer	Logic ground. When "Auto feed" in the menu is set as valid under Epson mode, this signal goes to Low level and the printer generates a line feed after recieving CR code.
15	Not used			
16	0 V	No return		Logic ground.
17	Frame Ground	No return		Printer's frame ground. In the printer, the frame ground and the logic ground are isolated from each other.
18	+5 V		From printer	+5 V supply (1.2 mA max.)
19 to 30	0 V			Twisted-pair return (for pin No. 1 to No. 12).
31	I-Prime		To printer	Clear/reset/initialize. Low pulse.
32	Fault		From printer	The level of this signal is low when the printer: 1. Is in the paperend state. 2. Is in the errorstate.
33	0 V	No return		Logic ground.
34	Not used			
35	Pulled High			Fixed to High (Connected to 5V thru 3.3kΩ).

Pin#	Signal	Return Pin#	Direction	Description
36	$\overline{\text{SLCT-IN}}$	No return	To printer	In the Epson mode, when menu item "Print Suppress Effective" is Yes, and the $\overline{\text{SLCT-IN}}$ signal is high, the DC1/DC3 code is valid, and invalid when the signal is Low.

Universal Serial Bus (USB)

Universal Serial Bus Specification Revision 1.1 compliance.

1. Connector
   - Printer Side: “B” Receptacle (Upstream Input to the USB Device)
   - Cable Side: Series “B” Plug

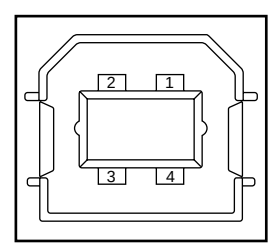
2. Cable
   - Cable Length: Max 5 m (A cable must be met USB Spec Rev 1.1 for normal operation

Note: Cable is not provided.

3. Table of USB I/F signals

Contact Number	Signal Name
1	Vbus
2	D-
3	D+
4	GND
Sell	Shield

4. Connector pin arrangement



Serial Cable

The Microline 184 Turbo requires an RS-232C shielded cable, UL and CSA (equivalent to European standards) approved, no more than 50 feet in length, with the following:

- Cannon DB-25P plug (or equivalent) with 25 pins
- Cannon DB-2C-J9 (or equivalent) connector shell

Super-Speed Serial Interface Signal Requirements:

Pin	Signal	Symbol	Direction	Description
1	Frame Ground	FG	Ground	Connected to the printer frame.
2	Transmit Data	TD	From Printer	Transmits serial data from the printer in XON/XOFF protocol.
3	Receive Data	RD	To Printer	Serial data received by the printer.
4	Request to Send	RTS	From Printer	In Printer Ready/Busy protocol indicates printer not ready to receive data.
6	Data Set Ready	DSR	To Printer	Tells the printer the computer is ready to send data. The printer receives data after confirming this signal as high (+).
7	Signal Ground	SG	Ground	Ground.
11	Supervisory Send Data	SSD	From Printer	Indicates the printer is ready to receive data in Printer Ready/Busy protocol.
20	Data Terminal Ready	DTR	From Printer	Indicates the printer is not ready to receive data in Printer Ready/ Busy protocol.

In addition to the cable, this serial interface has a piggyback circuit board that must be installed in the printer. On the board are 16 function switches (two sets of eight switches) that you may have to reset depending on the model computer you connect to the printer.

Before installing the board, make sure the switches are set properly. The function of each switch is as follows:

Switches 1, 2: Work together to regulate parity (odd, even, or no parity). Factory set to no parity. You can reset the switches as shown below.

Selection	**Switch 1**	**Switch 2**
Odd Parity	ON	OFF
Even Parity	OFF	ON
No Parity	ON/OFF	ON

Note: When the serial data 7 or 8-bits is set to 7, the parity must be set to either ODD or EVEN. 7-bit serial data will not be printed correctly if the parity is set to None.

Switch 3: Factory set ON to select 8-bit data. Set this switch to OFF if you have a 7-bit system.

Switch 4: Factory set ON for printer Ready/ Busy protocol. Set this switch to OFF if your computer uses XON/XOFF protocol.

Switches 5, 6: Work together to enable you to run two serial cable tests: one checks to ensure that you have the proper switch settings, and the other checks the data cable to see if it is communicating properly. The factory setting is the nontest mode, called the print mode; page B-10 provides details about the circuit and monitor tests.

Selection	Switch 4	Switch 5
Print Mode	ON/OFF	ON
Circuit Test	ON	OFF
Monitor Test	OFF	OFF

Switches 7, 8: If you selected printer Ready/ Busy protocol (Switch 4 is ON), you can choose the line on which the printer sends a busy signal and the polarity of the signal (low or high). Factory set for a low (-) on pin #11, SSD. You can have the printer send a busy signal on the following lines:

Selection	Switch 7	Switch 8
DTR Pin #20 (-v)	ON	ON
RTS Pin #4 (-v)	ON	OFF
SSD Pin #11 (-v)	OFF	ON
SSD Pin #11 (-v)	OFF	OFF

Switches 9 to 11: Select the transmission speed (baud rate) from the chart below. The switches are factory set to select 9600 baud.

Switch 12: If printer pin #6, DSR, is connected to the computer, leave this switch in the factory ON setting. If the computer does not use the DSR signal, set this switch to OFF to prevent static transmission.

Selection	Switch 9	Switch 10	Switch 11
19200	ON	ON	ON
9600	OFF	ON	ON
4800	ON	OFF	ON
2400	OFF	OFF	ON
1200	ON	ON	OFF
600	OFF	ON	OFF
300	ON	OFF	OFF
110	OFF	OFF	OFF

Switch 13: This switch is factory set to ON so that the printer waits until the print buffer has room for only 32 more bytes before sending a busy signal to the computer. If you discover that you are losing data, set this switch to OFF. The printer will send a busy signal when room for only 256 more characters remains in the print buffer.

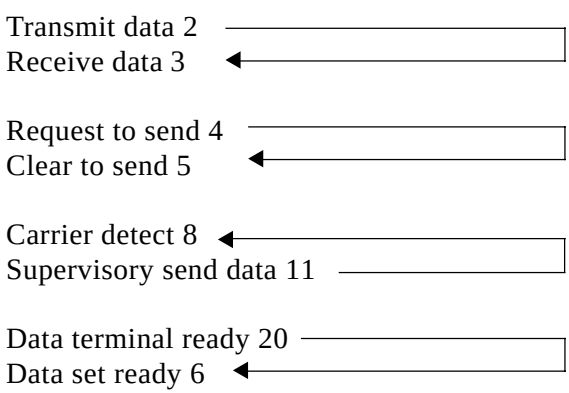
Switch 14: Factory set ON for a 200-ms busy time (the time it takes the printer to empty the print buffer and be ready to receive data), this switch can be set to OFF if your computer requires more time to process a response to a busy signal. This situation normally arises when the printer is not connected directly to the host computer.

Note: Those switches not mentioned in the list above are not currently used and should be left in their factory set positions.

Super-Speed Serial Board Diagnostic Tests

If you would like to check your serial cable to ensure it is sending and receiving the right signals, you can run either of the following tests. For the circuit test, however, you need to purchase (or make) a test cable as shown below then follow the directions under Performing the Circuit Test.

1. Purchase or make a test cable, using a Cannon D13-25P plug, to jumper the following pins:



2. Be sure to have paper and ribbon inserted, then turn the printer off.

3. Remove the printer cabinet.

4. Remove the platen knob.

5. Remove the access cover, roll paper stand, and tractor feed unit if installed.

6. Loosen the two recessed mounting screws on both sides of the top front on the printer.

7. Lift off the cabinet.

Performing the Circuit Test

A circuit test checks the serial inerf ace to ensure that the proper signals are being sent on the active lines. The test provides a printout notice indicating whether the test was performed successfully. After you remove the printer cabinet, proceed as follows:

1. Set switch #6 to OFF, selecting the circuit test.

2. Disconnect your interface cable and connect the test cable.

3. Turn the printer on, leaving the cabinet off; the test should produce the following results:

   LOOP TEST is printed
   RAM 2K is printed

The message buffer is checked. If memory is normal, OK is printed. If memory is faulty, BAD is printed. Signals DTR, RTS, and SSD are set to low (–). If CTS, DSR, or CD is positive, “IF BAD” is printed.

4. If you received a BAD message, something is wrong with your serial interface. If you are unable to diagnose the problem contact your nearest OKI dealer for further assistance.

5. Reset switch #6 to the ON position.

6. Replace the printer cabinet or proceed to the following instructions on the monitor mode test.

Performing the Monitor Mode Test

The monitor mode test is a unique feature of the Super-Speed board. With this test, you can verify that the data sent to the printer is set at the proper baud rate, parity, and data bits. To perform this test, proceed as follows:

1. Set switches 5 and 6 to OFF to select the monitor mode test.
2. Turn the printer and computer on, leaving the printer cabinet off.
3. Enter the characters ABCDE followed by a carriage return and a line feed.*

* Use the programming statement your computer requires, such as LPRINT or PR# 1 . In BASIC, the statement looks like this:

10 LPRINT ABCDE

4. The printer responds by printing the hexadecimal equivalent of each character you entered, each on a separate line. With the above statement, you should get this:

41
42
43
44
45
0D
0A

Note: The hexadecimal numbers 41 through 45 are the characters A through E. 0D and 0A hexadecimal symbols for a carriage return and line feed.

5. If you got the above printout, congratulations, your cable is correctly configured for the ML 184 Turbo+. At this point, you can replace the cabinet and close up the printer.

6. If you did not get the right printout, review what you got instead, to determine what went wrong.

Nothing Printed:

a. Make sure you used the right print statement for your computer.

b. Verify that your interface cable is connected properly.

c. Make sure your cable is wired to satisfy all the requirements of both your compute and your printer.

d. Make sure the printer is plugged in.

Parity Error Printed:

A parity error occurs when the printer checks for an odd number of binary digits and an even number is received or vice versa. If you have switch 1 set to ON for odd parity, try the OFF setting. If you have it OFF, try the ON setting for even parity. Then turn the printer off and try the test again.

If your problem still is not corrected, and your ML 184 Turbo+ successfully performed the printer self-test call your dealer for further assistance.

Appendix C

ASCII Character Codes

Lower ASCII Character Sets

Lower ASCII Character Sets (1/4)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Set 1	IBM Set 2 ML Line Graphics	IBM Set 3	ML Standard & Block Graphics
00	0	NUL	NUL	NUL	NUL	∅	
01	1					☺	
02	2					☻	STX
03	3				♥	♥	ETX
04	4				♦	♦	
05	5				♣	♣	
06	6				♠	♠	
07	7					•	
08	8	BS	BS	BS	BS	◘	BS
09	9	HT	HT	HT	HT	○	HT
0A	10	LF	LF	LF	LF	■	LF
0B	11	VT	VT	VT	VT	♂	VT
0C	12	FF	FF	FF	FF	♀	FF
0D	13	CR	CR	CR	CR	♪	CR
0E	14	SO	SO	SO	SO	♫	SO
0F	15	SI	SI	SI	SI	☼	SI
10	16					►	
11	17	DC1	DC1	DC1	DC1	◄	DC1
12	18	DC2	DC2	DC2	DC2	↕	DC2
13	19	DC3	DC3	DC3	DC3	‼	DC3
14	20	DC4	DC4	DC4	DC4	¶	DC4
15	21		§		§	§	
16	22					-	
17	23					↨	
18	24	CAN	CAN	CAN	CAN	↑	CAN
19	25	EM	EM	EM	EM	↓	EM
1A	26					→	
1B	27	ESC	ESC	ESC	ESC	←	ESC
1C	28				FS	∟	FS
1D	29				GS	↔	GS
1E	30				RS	▲	RS
1F	31				US	▼	US
20	32	Space	Space	Space	Space	Space	Space

Lower ASCII Character Sets (2/4)

Hex.	Dec.	Epson Sets 1 & 2	IBM Set 1	IBM Set 2 ML Line Graphics	IBM Set 3	ML Standard & Block Graphics
21	33	!	!	!	!	!
22	34	"	"	"	"	"
23	35	#	#	#	#	#
24	36	$	$	$	$	$
25	37	%	%	%	%	%
26	38	&	&	&	&	&
27	39	'	'	'	'	'
28	40	(	(	(	(	(
29	41	)	)	)	)	)
2A	42	*	*	*	*	*
2B	43	+	+	+	+	+
2C	44	,	,	,	,	,
2D	45	-	-	-	-	-
2D	46	.	.	.	.	.
2F	47	/	/	/	/	/
30	48	0	0	0	0	0
31	49	1	1	1	1	1
32	50	2	2	2	2	2
33	51	3	3	3	3	3
34	52	4	4	4	4	4
35	53	5	5	5	5	5
36	54	6	6	6	6	6
37	55	7	7	7	7	7
38	56	8	8	8	8	8
39	57	9	9	9	9	9
3A	58	:	:	:	:	:
3B	59	;	;	;	;	;
3C	60	<	<	<	<	<
3D	61	=	=	=	=	=
3E	62	>	>	>	>	>
3F	63	?	?	?	?	?
40	64	@	@	@	@	@
41	65	A	A	A	A	A

Lower ASCII Character Sets (3/4)

Hex.	Dec.	Epson Sets 1 & 2	IBM Set 1	IBM Set 2 ML Line Graphics	IBM Set 3	ML Standard & Block Graphics
42	66	B	B	B	B	B
43	67	C	C	C	C	C
44	68	D	D	D	D	D
45	69	E	E	E	E	E
46	70	F	F	F	F	F
47	71	G	G	G	G	G
48	72	H	H	H	H	H
49	73	I	I	I	I	I
4A	74	J	J	J	J	J
4B	75	K	K	K	K	K
4C	76	L	L	L	L	L
4D	77	M	M	M	M	M
4E	78	N	N	N	N	N
4F	79	O	O	O	O	O
50	80	P	P	P	P	P
51	81	Q	Q	Q	Q	Q
52	82	R	R	R	R	R
53	83	S	S	S	S	S
54	84	T	T	T	T	T
55	85	U	U	U	U	U
56	86	V	V	V	V	V
57	87	W	W	W	W	W
58	88	X	X	X	X	X
59	89	Y	Y	Y	Y	Y
5A	90	Z	Z	Z	Z	Z
5B	91	[	[	[	[	[
5C	92	\	\	\	\	\
5D	93	]	]	]	]	]
5E	94	^	^	^	^	^
5F	95	_	_	_	_	_
60	96	`	`	`	`	`

Lower ASCII Character Sets (4/4)

Hex.	Dec.	Epson Sets 1 & 2	IBM Set 1	IBM Set 2 ML Line Graphics	IBM Set 3	ML Standard & Block Graphics
61	97	a	a	a	a	a
62	98	b	b	b	b	b
63	99	c	c	c	c	c
64	100	d	d	d	d	d
65	101	e	e	e	e	e
66	102	f	f	f	f	f
67	103	g	g	g	g	g
68	104	h	h	h	h	h
69	105	i	i	i	i	i
6A	106	j	j	j	j	j
6B	107	k	k	k	k	k
6C	108	l	l	l	l	l
6D	109	m	m	m	m	m
6E	110	n	n	n	n	n
6F	111	o	o	o	o	o
70	112	p	p	p	p	p
71	113	q	q	q	q	q
72	114	r	r	r	r	r
73	115	s	s	s	s	s
74	116	t	t	t	t	t
75	117	u	u	u	u	u
76	118	v	v	v	v	v
77	119	w	w	w	w	w
78	120	x	x	x	x	x
79	121	y	y	y	y	y
7A	122	z	z	z	z	z
7B	123	{	{	{	{	{
7C	124	|	|	|	|	|
7D	125	}	}	}	}	}
7E	126	~	~	~	~	~
7F	127	DEL			⌂	■

Upper ASCII Character Sets

Upper ASCII Character Sets (1/4)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Set 1	IBM Set 2 ML Line Graphics	ML Standard	ML Block Graphics
80	128	NUL	Ç	NUL	Ç	NUL	
81	129		ü		ü		
82	130		é		é	STX	
83	131		â		â	ETX	
84	132		ä		ä		
85	133		à		à		
86	134		å		å		
87	135		ç		ç		
88	136	BS	ê	BS	ê	BS	
89	137	HT	ë	HT	ë	HT	
8A	138	LF	è	LF	è	LF	
8B	139	VT	ï	VT	ï	VT	
8C	140	FF	î	FF	î	FF	
8D	141	CR	ì	CR	ì	CR	
8E	142	SO	Ä	SO	Ä	SO	
8F	143	SI	Å	SI	Å	SI	
90	144		É		É		
91	145	DC1	æ	DC1	æ	DC1	
92	146	DC2	Æ	DC2	Æ	DC2	
93	147	DC3	ô		ô	DC3	
94	148	DC4	ö	DC4	ö	DC4	
95	149		ò		ò		
96	150		û		û		
97	151		ù		ù		
98	152	CAN	ÿ	CAN	ÿ	CAN	
99	153	EM	Ö	EM	Ö	EM	
9a	154		Ü		Ü		
9B	155	ESC	¢	ESC	¢	ESC	
9C	156		£		£	FS	
9D	157		¥		¥	GS	
9E	158		₧		₧	RS	
9F	159		*f*		*f*	US	
A0	160	Space	á	á	á	á	

Upper ASCII Character Sets (2/4)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Sets 1, 2 & 3 ML Standard	ML Block Graphics
A1	161	!	í	í	
A2	162	"	ó	ó	
A3	163	#	ú	ú	
A4	164	$	ñ	ñ	
A5	165	%	Ñ	Ñ	
A6	166	&	ª	ª	
A7	167	'	º	º	
A8	168	(	¿	¿	
A9	169	)	⌐	⌐	
AA	170	*	¬	¬	
AB	171	+	½	½	
AC	172	,	¼	¼	
AD	173	-	¡	¡	
AE	174	.	«	«	
AF	175	/	»	»	
B0	176	0	▒	▒	
B1	177	1	▓	▓	
B2	178	2	│	│	
B3	179	3	┤	┤	
B4	180	4	╡	╡	
B5	181	5	╢	╢	
B6	182	6	╖	╖	
B7	183	7	╕	╕	
B8	184	8	╣	╣	
B9	185	9	║	║	
BA	186	:	╗	╗	
BB	187	;	╝	╝	
BC	188	<	╜	╜	
BD	189	=	╛	╛	
BE	190	>	┐	┐	
BF	191	?	└	└	
C0	192	@	┴	┴	
C1	193	A			

Upper ASCII Character Sets (3/4)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Sets 1, 2 & 3 ML Standard	ML Block Graphics
C2	194	*B*	┬	┬	
C3	195	*C*	├	├	
C4	196	*D*	─	─	
C5	197	*E*	┼	┼	
C6	198	*F*	╞	╞	
C7	199	*G*	╟	╟	
C8	200	*H*	╚	╚	
C9	201	*I*	╔	╔	
CA	202	*J*	╩	╩	
CB	203	*K*	╦	╦	
CC	204	*L*	╠	╠	
CD	205	*M*	═	═	
CE	206	*N*	╬	╬	
CF	207	*O*	╧	╧	
D0	208	*P*	╨	╨	
D1	209	*Q*	╤	╤	
D2	210	*R*	╥	╥	
D3	211	*S*	╙	╙	
D4	212	*T*	╘	╘	
D5	213	*U*	╒	╒	
D6	214	*V*	╓	╓	
D7	215	*W*	╫	╫	
D8	216	*X*	╪	╪	
D9	217	*Y*	┘	┘	
DA	218	*Z*	┌	┌	
DB	219	[			
DC	220	\			
DD	221	]			
DE	222	^			
DF	223	-			
E0	224	`	α	α	

Upper ASCII Character Sets (4/4)

Hex.	Dec.	Epson Set 1	Epson Set 2	IBM Sets 1, 2 & 3 ML Standard	ML Block Graphics
E1	225	*a*	β	β	
E2	226	*b*	Γ	Γ	
E3	227	*c*	π	π	
E4	228	*d*	Σ	Σ	
E5	229	*e*	σ	σ	
E6	230	*f*	µ	µ	
E7	231	*g*	τ	τ	
E8	232	*h*	Φ	Φ	
E9	233	*i*	Θ	Θ	
EA	234	*j*	Ω	Ω	
EB	235	*k*	δ	δ	
EC	236	*l*	∞	∞	
ED	237	*m*	ø	ø	
EE	238	*n*	ε	ε	
EF	239	*o*	∩	∩	
F0	240	*p*	≡	≡	
F1	241	*q*	±	±	
F2	242	*r*	≥	≥	
F3	243	*s*	≤	≤	
F4	244	*t*	⌠	⌠	
F5	245	*u*	⌡	⌡	
F6	246	*v*	÷	÷	
F7	247	*w*	≈	≈	
F8	248	*x*	°	°	
F9	249	*y*	∙	∙	
FA	250	*z*	·	·	
FB	251	*{*	√	√	
FC	252	*|*	n	n	
FD	253	*}*	2	2	
FE	254	*~*	■	■	
FF	255	*DEL*	Space	Space	

Epson International Character Substitutions

	35	36	38	64	79	91	92	93	94	95	96	123	124	125	126
American	#	$	&	@	O	[	\	]	^	-	`	{	|	}	~
British	£	$	&	@	O	[	\	]	^	_	`	{	|	}	~
Danish I	#	$	&	@	O	Æ	Ø	Å	^	_	`	æ	ø	å	~
Danish II	#	$	&	É	O	Æ	Ø	Å	Ü	_	é	æ	ø	å	ü
Dutch	£	$	&	@	O	[	IJ	]	^	_	`	{	ij	}	~
French	#	$	&	à	O	°	ç	§	^	_	`	é	ù	è	¨
French Canadian	ü	$	ë	à	Ø	â	ç	ê	î	ï	ô	é	ù	è	û
German	#	$	&	§	O	Ä	Ö	Ü	^	_	`	ä	ö	ü	ß
Italian	#	$	&	@	O	°	\	é	^	_	ù	à	ò	è	í
Japanese	#	$	&	@	O	[	¥	]	^	_	`	{	|	}	~
Latin American	#	$	&	á	O	¡	Ñ	¿	é	_	ü	í	ñ	ó	ú
Norwegian	#	¤	&	É	O	Æ	Ø	Å	Ü	_	é	æ	ø	å	ü
Publisher	#	$	&	§	O	°	´	"	¶	–	`	©	®	†	™
Spanish I	₧	$	&	@	O	¡	Ñ	¿	^	_	`	¨	ñ	}	~
Spanish II	#	$	&	á	O	¡	Ñ	¿	é	_	`	Í	ñ	ó	ú
Swedish	#	¤	&	É	O	Ä	Ö	Å	Ü	_	é	ä	ö	å	ü

IBM International Character Substitutions

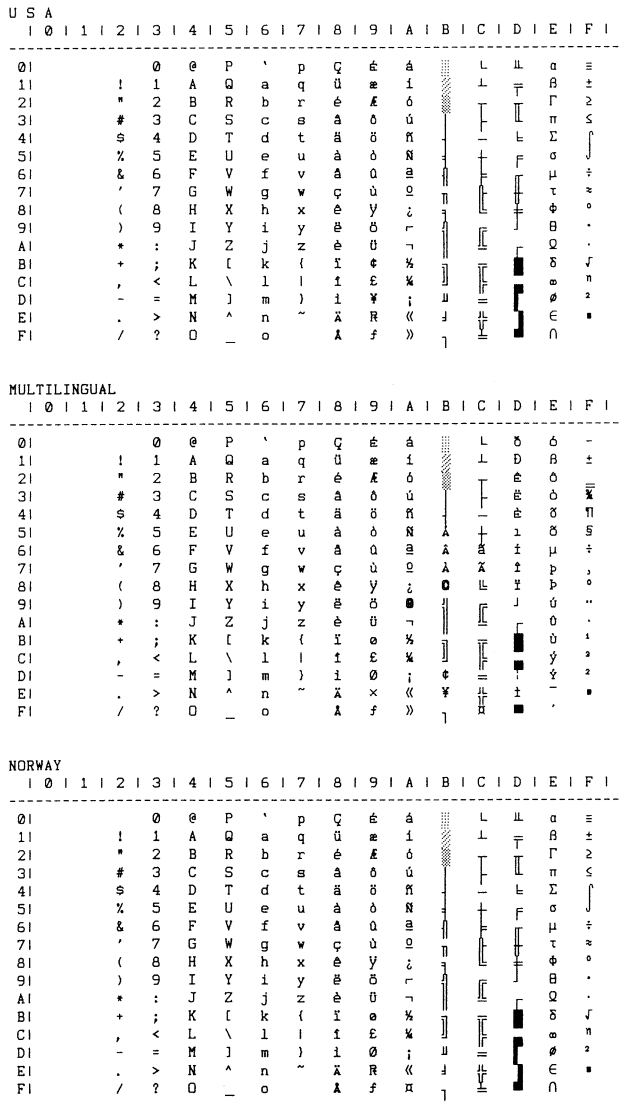
	35	36	38	48	64	79	91	92	93	94	95	96	123	124	125	126
American (slashed zero)	#	$	&	0	@	O	[	\	]	^	_	`	{	|	}	~
American (unslashed zero)	#	$	&	0	@	O	[	\	]	^	_	`	{	|	}	~
British	£	$	&	0	@	O	[	\	]	^	_	`	{	|	}	~
Danish	#	$	&	0	@	O	Æ	Ø	Å	Ü	_	`	æ	ø	å	ü
Dutch	£	$	&	0	@	O	[	IJ	]	^	_	`	{	IJ	}	~
French	£	$	&	0	à	O	°	ç	§	^	_	`	é	ü	è	ê
French Canadian	ü	$	ë	0	à	Ø	â	ç	ê	î	ï	ô	é	ù	è	û
German	#	$	&	0	§	O	Ä	Ö	Ü	^	_	`	ä	ö	ú	ß
Italian	£	$	&	0	§	O	°	ç	é	^	_	ù	à	ò	è	ì
Latin American	#	$	&	0	á	O	¡	Ñ	¿	é	_	ü	í	ñ	ó	ú
Norwegian	#	$	&	0	@	O	Æ	Ø	Å	^	_	·	æ	ø	å	~
Publisher	#	$	&	0	§	O	°	′	"	¶	_	`	©	®	†	™
Spanish	!	$	&	0	¡	O	Ñ	ñ	¿	ü	_	á	é	í	ó	ú
Swedish	§	¤	&	0	É	O	Ä	Ö	Å	^	_	é	ä	ö	å	ü

MICROLINE International Character Substitutions

	35	36	38	48	64	79	91	92	93	94	95	96	123	124	125	126
American (slashed zero)	#	$	&	Ø	@	O	[	\	]	^	_	′	{	|	}	~
American (unslashed zero)	#	$	&	0	@	O	[	\	]	^	_	′	{	|	}	~
British	£	$	&	0	@	O	[	\	]	^	_	′	{	|	}	~
Danish	#	$	&	0	@	O	Æ	Ø	Å	Ü	_	`	æ	ø	å	ü
Dutch	£	$	&	0	@	O	[	IJ	]	^	_	′	{	ij	}	~
French	£	$	&	0	à	O	·	ç	§	^	_	′	é	ü	è	ê
French Canadian	ü	$	ë	0	à	Ø	â	ç	ê	î	ï	ô	é	ù	è	û
German	#	$	&	0	§	O	Ä	Ö	Ü	^	_	′	ä	ö	ü	ß
Italian	£	$	&	0	§	O	•	ç	é	^	_	ù	à	ò	è	ì
Norwegian	#	$	&	0	@	O	Æ	Ø	Å	^	_	·	æ	ø	å	~
Publisher	#	$	&	0	§	O	•	′	¨	¶	±	`	©	®	†	™
Spanish	!	$	&	0	¡	O	Ñ	ñ	¿	ü	_	á	é	í	ó	ú
Swedish	§	¤	&	0	É	O	Ä	Ö	Å	^	_	é	ä	ö	å	ü

Code Page Character Sets

Code Page Character Sets (1/3)



Code Page Character Sets (2/3)

Abicomp

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				ò	¡	ò		
1			!	1	A	Q	a	q			À	ó	à	ó		
2			"	2	B	R	b	r			Á	ô	á	ô		
3			#	3	C	S	c	s			Â	õ	â	õ		
4			$	4	D	T	d	t			Ã	ö	ã	ö		
5			%	5	E	U	e	u			Ä	Œ	ä	æ		
6			&	6	F	V	f	v			Ç	ù	ç	ù		
7			'	7	G	W	g	w			È	ú	è	ú		
8			(	8	H	X	h	x			É	û	é	û		
9			)	9	I	Y	i	y			Ê	ü	ê	ü		
A			*	:	J	Z	j	z			Ë	ÿ	ë	ÿ		
B			+	;	K	[	k	{			Ì	¨	ì	ß		
C			,	<	L	\	l	|			Í	£	í	ª		
D			-	=	M	]	m	}			Î	·	î	º		
E			.	>	N	^	n	~			Ï	ß	ï	¿		
F			/	?	O	_	o				Ñ	°	ñ	±		

MULTILINGUAL 858

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

ISO 8859/15

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

Code Page Character Sets (3/3)

PORTUGAL

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ü	è	í	─	┴	╤	ß	±
2			"	2	B	R	b	r	é	È	ó	│	┬	╥	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	┤	├	╙	π	≤
4			$	4	D	T	d	t	ã	õ	ñ	╡	─	╘	Σ	⌠
5			%	5	E	U	e	u	à	Ò	Ñ	╢	┼	╒	σ	⌡
6			&	6	F	V	f	v	Á	ò	ª	╖	╞	╓	µ	÷
7			'	7	G	W	g	w	Ç	ù	º	╕	╟	╫	τ	≈
8			(	8	H	X	h	x	ê	ì	¿	╣	╚	╪	Φ	°
9			)	9	I	Y	i	y	ê	Ì	⌐	║	╔	┘	Θ	∙
A			*	:	J	Z	j	z	è	Ü	¬	╗	╩	┌	Ω	·
B			+	;	K	[	k	{	ï	¢	½	╝	╦	█	δ	√
C			,	<	L	\	l	|	Ô	£	¼	╜	╠	▄	∞	ⁿ
D			-	=	M	]	m	}	ì	Ù	¡	╛	═	▌	ø	²
E			.	>	N	^	n	~	Ã	Ř	«	╤	╬	▐	Є	■
F			/	?	O	_	o		Â	ó	»	╧	╧	▀	∩	

CANADA FRENCH

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	¦	▒	└	╨	α	≡
1			!	1	A	Q	a	q	ü	è	'	─	┴	╤	ß	±
2			"	2	B	R	b	r	é	ê	ó	│	┬	╥	Γ	≥
3			#	3	C	S	c	s	â	ô	ú	┤	├	╙	π	≤
4			$	4	D	T	d	t	à	Â	¨	╡	─	╘	Σ	⌠
5			%	5	E	U	e	u	¶	û	‚	╢	┼	╒	σ	⌡
6			&	6	F	V	f	v	§	ù	ª	╖	╞	╓	µ	÷
7			'	7	G	W	g	w	ç	¤	¯	╕	╟	╫	τ	≈
8			(	8	H	X	h	x	ê	Ô	±	╣	╚	╪	Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐	║	╔	┘	Θ	∙
A			*	:	J	Z	j	z	è	Ü	¬	╗	╩	┌	Ω	·
B			+	;	K	[	k	{	ï	¢	½	╝	╦	█	δ	√
C			,	<	L	\	l	|	î	£	¼	╜	╠	▄	∞	ⁿ
D			-	=	M	]	m	}	ì	ù	¡	╛	═	▌	ø	²
E			.	>	N	^	n	~	Ä	û	«	╤	╬	▐	Є	■
F			/	?	O	_	o		§	ƒ	»	╧	╧	▀	∩	

BRASCII

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

Appendix D

Menu Selections

The menu selections for your printer are summarized below. The factory defaults are marked with "*". Explanations for each item follow the table.

The table below summarizes all possible menu settings available with your printer. Which of these you will actually see when you are working in the Menu depends on the active emulation and on the options installed.

Group	Item	Sets
Printer Control	Emulation Mode	IBM * Epson ML
Font	Print Mode	Utility * NLQ Courier NLQ Gothic DRAFT
	DRAFT Mode	HSD SSD *
	Pitch	10CPI * 12 CPI 15 CPI 17.1 CPI 20 CPI
	Proportional Spacing	No * Yes
	Style	Normal * Italics
	Size 1)	Single * Double

Group	Item	Sets
Symbol Sets	Character Set	Set I Set II * Standard, Line Graphics, Block Graphics (ML Mode only)
	Language Set	American * French German British Danish I Swedish Italian Spanish I Japanese Norwegian Danish II Spanish II Latin American French Canadian Dutch Publisher
	Zero Character	Slashed Unslashed *
	Code Page	USA * Canada French Multilingual Portugal Norway BRASCII Abicomp Multilingual 858 ISO8859-15
	Slashed Letter O	No * Yes
Vertical Control	Line Spacing	6 LPI * 8 LPI
	Skip Over Perforation	No * Yes

Group	Item	Sets
Vertical Control	Page Length	11" 11 2/3" 12" * 14" 17" 5" 3" 3.5" 4" 5.5" 6" 7" 8" 8.5"
Set-Up	Graphics	Bi-directional Uni-directional *
	7 or 8 Bits Graphics 4)	8 7 *
	Receive Buffer Size 2)	1 Line 32K 64K * 128K
	Paper Out Override	No * Yes
	Print Registration	0.25 mm Right 0.20 mm Right 0.15 mm Right 0.10 mm Right 0.05 mm Right 0 * 0.05 mm Left 0.10 mm Left 0.15 mm Left 0.20 mm Left 0.25 mm Left
	7 or 8 Bits Data Word 4)	8 *, 7
	Operator Panel Function 3)	Full Operation Semi Operation * Limited Operation

Group	Item	Sets
Set-Up	Reset Inhibit	No * Yes
	Print Suppress Effective	No Yes *
	Auto LF	No * Yes
	Auto CR 5)	No Yes *
	Print DEL Code 4)	No Yes *
	Sl Select Pitch (10 CPI) 5)	15 CPI 17.1 CPI *
	Sl Select Pitch (12 CPI) 5)	12 CPI * 20 CPI
	Time Out Print	Valid Invalid *
	Auto Select	No * Yes
	ESC SI Pitch 5)	17.1 CPI *, 20CPI
	CSF/RPS Select	RPS * CSF
	Impact Mode	Normal * Quiet
Parallel I/F	I-Prime	Invalid Buffer Print * Buffer Clear
	Pin 18	+ 5V * Open
	Auto Feed XT 6)	Valid Invalid *
	Bi-Direction	Enable * Disable

Group	Item	Sets
CSF 7)	Line Spacing	6 LPI * 8 LPI
	Bottom Margin	Valid Invalid *
	Page Length	11" 11 2/3" 12" * 14" 17" 5" 3.5" 4" 5.5" 6" 7" 8" 8.5"

Notes: 1. Selects both double width and double height characters OR single width and single height characters.
2. When "1 Line" is selected, the receiving buffer size is set to 2K bytes.
3. When "Limited Operation" is selected, after exiting MENU, only the SEL, LF and FF switches are valid. PRINT QUALITY, TOF and PITCH are invalid.
4. Displayed only for ML emulation.
5. Displayed only for IBM emulation.
6. Displayed only for EPSON emulation.
7. Displayed only when CFS is selected.

Explanation of Menu Items

These explanations are in alphabetical sequence to make it easier to look them up. Many of the items will appear only with optional equipment installed, as noted below. You will find the items Line Spacing, and Page Length appearing several times in the menu (once for each paper path).

7 or 8 Bit Graphics. Choose 7 (factory default) or 8 bits.
7 or 8 Bit Data word. Choose 8 (factory default) or 7 bits.

Auto CR. IBM mode only. No or Yes (factory default) . Choose Yes to make your printer automatically perform a carriage return when a LF is received at the end of the line.

Auto LF. No (factory default) or Yes. Change to Yes if your printer overprints. Keep this set to No if your software adds a line feed when a carriage is received at the end of a line. If your printout is consistently double spaced, set this item to No.

Auto Select. No (factory default) or Yes. Determines whether or not your printer will automatically be selected after you load in paper. With the factory default (No) engaged, the printer will be deselected so that you can set the Top of Form. If you always use the same Top of Form setting, change this setting to Yes so that you don't have to press the SEL button to select the printer after loading paper.

Auto Feed XT. Epson mode only. Invalid (factory default) or Valid. In the Epson emulation, the XT signal on pin 14 of the parallel interface can control automatic line feed. Some interface cables are wired in such a way that automatic line feed is always in effect: the Auto Feed XT item eliminates this potential problem. The factory setting causes the printer to ignore this signal; if your system uses pin 14 to control automatic line feed, change the setting to Valid.

Bi-Direction. Enable (factory default) or Disable. Enables or disables the bi-directional transmission (PnP) in Nibble mode.

Bottom Margin. Valid or Invalid (factory default). Sets whether or not the printer will ignore the bottom margin setting. Change the setting to Invalid if you want printer to ignore the bottom margin setting. Be careful if you use this feature: it lets the printer continue printing when there's no more paper, which can cause loss of data and may damage the printhead.

Character Set.

Choose IBM Set I or IBM Set II (factory default). (EPSON, IBM mode)
Choose Standard, Line Graphics. (ML mode)

Code Page. Choose USA (factory default), Canada French, Multilingual, Portugal, Norway BRASCII, Abicomp.

CSF/RPS Select. Selects an option.
RPS (factory default) ... Roll paper stand
CSF ..... Cut-sheet feeder

DRAFT Mode. Choose HSD or SSD (factory default) for DRAFT font. The selected font becomes effective when "DRAFT" is selected at the Print Mode selection.

Emulation Mode. IBM (factory default), Epson, or ML. Selects the Printer command set you want your printer to use: IBM, Epson, or OKI Microline.

ESC SI Pitch. Designate the function of ESC SI command to 17 cpi setting (default) or 20 cpi setting.

Graphics. Bi-directional or Uni-directional (factory default). Bi-directional graphics print faster than uni-directional graphics, but uni-directional graphics have better print registration. Bi-directional graphics printing can be optimized by adjusting the Print Registration setting in the Menu.

Impact Mode. Selects a print mode.
Normal (factory default):Normal printing
Quiet :Quiet printing

I-Prime. Buffer Print (factory default), Buffer Clear, or Invalid. Determines how the printer will react to the I-Prime signal from your software. With the factory default engaged, when the printer receives the I-Prime signal, it will print out the contents of the buffer before resetting. Change the setting to Buffer Clear if you wish the printer to dump the contents of its buffer immediately upon receiving the I-Prime signal. Change to Invalid if you want the printer to ignore your software's I-Prime signal. This will permit you to enter settings through the printer's control panel which will not be automatically overridden by the software's settings when the I-Prime signal is sent.

Language Set. American (factory default), French, German, British, Danish I, Swedish, Italian, Spanish I, Japanese, Norwegian, Danish II, Spanish II, Latin American, French Canadian, Dutch, or Publisher. Replaces certain symbols with special characters used in the respective foreign languages.

Line Spacing. 6 lpi (factory default) or 8 lpi. Choose 8 lines per inch for tighter line spacing, to get more lines per page.

Operator Panel Function. Full Operation or Semi Operation (factory default) or Limited Operation. Change to Limited Operation to deactivate the TOF SET, PRINT QUARITY and CHARACTER PITCH buttons on the control panel. Then you can control these features only through your software. This can be useful when several people are using the printer and you don't want its settings changed.

Page Length. 11", 11 $^{2}/_{3}$", 12" (factory default), 14", 17", 5", 3", 3.5", 4", 5.5", 6", 7", 8", 8.5". Selects the length of the paper you'll be using in your printer. This enables the printer to keep track of the initial printing position on each page (Top of Form).

Paper out Override. No (factory default) or Yes. The paper out detector senses when less than an inch of paper remains in the printer and stops printing at that point. Changing this setting to Yes overrides the detector so you can print closer to the bottom of the page if you're using single sheets. Be careful if you use this feature: it lets the printer continue printing when there's no more paper, which can cause loss of data and may damage the printhead.

Pin 18. +5V (factory default) or Open. Sets the signal on pin 18.

Pitch. 10 cpi (factory default), 12 cpi, 15 cpi, 17.1 cpi, or 20 cpi. Selects the character width measured in characters per inch (cpi).

Print DEL Code. Microline mode only. Choose No or Yes (factory default).

Print Mode. Utility (factory default) NLQ Courier, NLQ Gothic, DRAFT. Choose one of the NLQ fonts for letter quality printing; choose utility for higher-speed draft printing. Choose DRAFT for HSD or SSD. It prints either of HSD or SSD which is selected at the DRAFT MODE.

Print Registration. 0 (factory default), 0.05 mm Left, 0.15 mm Left, 0.20 mm Left, 0.25 mm Left, 0.25 mm Right, 0.20 mm Right, 0.15 mm Right, 0.10 mm Right, or 0.05 mm Right. Change the setting as required to obtain the best registration for bi-directional printing.

Print Suppress Effective. Yes (factory default) or No. Enables/disables print suppress command. The factory default enables the print suppress command: the printer will ignore all data it receives after it accepts the print suppress command. Change to No to cause your printer to ignore the print suppress command.

Proportional Spacing. No (factory default) or Yes. Change to Yes to engage proportional spacing of characters.

Receive Buffer Size. 64K (factory default), 1 Line, 32K, or 128K. Selects the amount of memory devoted to holding received data. Choosing 1 Line will tie up your computer during printing, but if you about the print job the printer will stop printing much sooner.

Reset Inhibit. No (factory default) or Yes. Change to Yes if you want your printer to ignore the reset command sent by software. This will prevent your software reset command from changing the settings you have made through the front panel controls or through printer commands. If you engage this feature, don't forget that it will also prevent your software from clearing out existing settings when you finish printing one document and switch to another.

SI Select Pitch (10 CPI). IBM mode only. 17.1 CPI (factory default) or 15 CPI. Sets what pitch (17.1 or 15 characters per inch) will be engaged when the printer control panel is set for 10 cpi and the SI command is received.

SI Select Pitch (12 CPI). IBM mode only. 20 CPI or 12 CPI (factory default). Sets what pitch (20 or 12 characters per inch) will be engaged when the printer control panel is set for 12 cpi and the SI command is received.

Size. Choose Single (factory default) or Double width and height printing.

Skip Over Perforation. No (factory default) or Yes. Change to Yes if you want the printer to advance automatically to the next page when it comes within one inch of the bottom of the page. If your software has its own page formatting controls, keep this item set to No to avoid interface.

Slashed Letter O. No (factory default) or Yes. Characters ¢ (155) and ¥ (157) will be set to slashed ø and slashed Ø if you set this item to YES.

Style. Choose Normal (factory default) or Italics.

Time Out Print. Valid or Invalid (factory default). When printing, if the printer doesn't receive any data, a line feed, or a form feed signal for awhile, it will automatically dump out what's in the print buffer. If your software spends a long time prossing between feeding portions of data to the printer, you should change the setting to Invalid to keep your printer from inadvertently dumping the received data while it's waiting for more.

Zero Character. Slashed or Unslashed (factory default). The factory default will cause a slash to appear in zeros to distinguish them from the capital letter O. To disengage the slashed zero, change this to Unslashed.

Appendix E

Specifications

1. Performance

Print Speed

Utility mode (Utility)	250 cps
Near Letter Quality (NLQ) mode	62.5 cps
High Speed Draft	333 cps
Super Speed Draft	375 cps at 12 CPI
Print Technique	Bidirectional/short line seeking Optional: unidirectional

2. Printing

Dot Matrix, standard characters	9 x 17 (NLQ) 9 x 9 (Utility)
Characters per line	80 CPL (10CPI)

3. Media

Number of sheets	1 to 4
Maximum width of paper	
Roll paper	216 mm
Pin feed	254 mm
Tractor feed	241 mm
Paper Path	bottom or rear

Ribbon
Cartridge with 3 million character life
1.0 to 1.6 seamless ribbon with reinking

4. Interfaces

Parallel	Centronics-compatible
USB	
Serial (Option)	
RS-232C Super Speed	Up to 19,200 baud

5. Reliability

Mean Time Between Failures (MTBF)	20,000 hours
Mean Time To Repair (MTTR)	15 minutes
Print head life	200 million characters

6. Electrical Requirements

Voltage	230 V+15%, -14%
Frequency	50/60 Hz ± 2%

7. Physical Requirements

Width	360 mm
Depth	275 mm
Height	80 mm
Weight	4.5 kg

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