EPSON®

LQ-2500
USER'S MANUAL

X-LQ2500

Installing the paper feed knob

Install the paper feed knob on the right side of the printer, as shown in Figure 1-2. tine up the flat side of the hole in the knob with the flat side of the shaft, then push the knob firmly into place.

Now, that you've installed the paper feed knob, use it to remove the sheet of paper that is behind the printers platen (the black roller).

Removing the print head protector

Remove the print head protector by opening the paper bail, then lifting the protector up and pulling it to the right as shown in Figure 1-3 below.

Figure 1-2.
Installing the paper feed knob

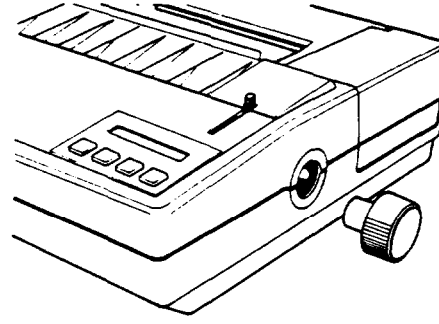
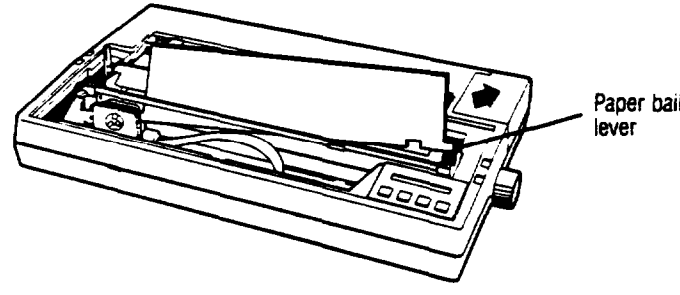


Figure 1-3.
Removing the print head protector



4. Place the paper on the paper guide with its left edge next to the edge tab as shown in Figure 1-10. Push the paper firmly into the printer, then let go of it. The display changes from **[PAPER OUT]** to [OFF LINE].

5. Pull the paper bail lever forward to the single-sheet loading position (indicated by the icon). This feeds the paper into the printer until it is past the paper bail.

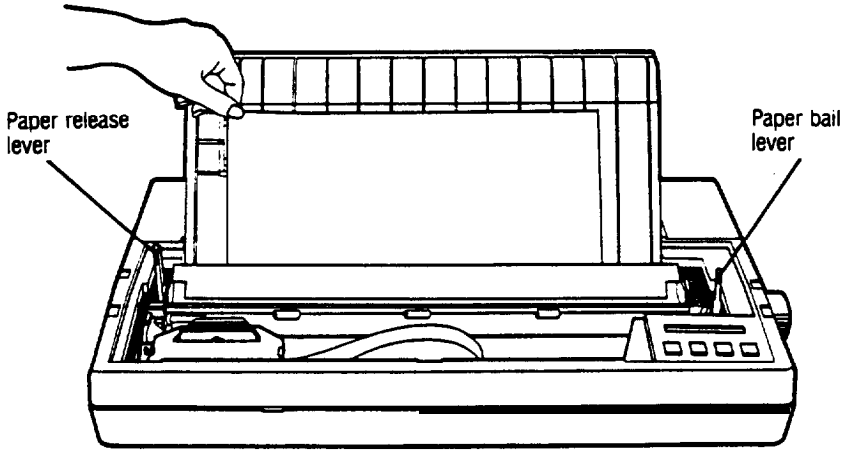
6. When the paper stops, push the paper bail lever back to the printing position. This feeds the paper backward until only its top edge is under the paper bail.

7. With the paper loaded, press the **ON LINE** button to place the printer on line. The display reads [ON LINE], **the** green **ON LINE** and **READY** lights come on, and the print head moves to the left **side** of the printer; this is the *home* position. The LQ-2500 is ready to print.

If the platen (the black roller) turns but the paper does not load, remove the paper from the printer and try again, starting at step 3. This time press the paper a little more firmly into place.

If nothing happens at all, see that the printer is turned ON and that the display reads [OFF LINE]. Then remove the paper and try again.

Fiqure 1-10.
Aligning the paper



Macro #l

Preset macro #1 is set for draft printing/word processing to produce high-speed, draft quality printing. It can be used for word processing to print rough drafts, or for any job you need printed in a hurry. You can also use enhancements and print styles, including *italic, double-width*, and emphasized.

Macro #2

Preset macro #2 is set for Letter Quality printing/word processing in the Roman font. It can be used for word processing *or* any application where you want a polished result. You can also use enhancements and print styles, including **italic, double-width**, and **emphasized.**

Macro #3

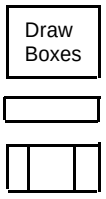
SALES REPORT

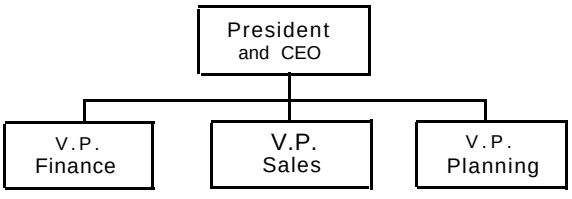
	Jan	Feb	Mar	Apr	May	Jun
J. Smith	*784*	*548*	*475*	*648*	*874*	*654*
T. Jones	*774*	*758*	*655*	*754*	*789*	*885*
L. Williams	*756*	*752*	*852*	841	*740*	*887*

Macro #4

Diagrams

Draw Boxes





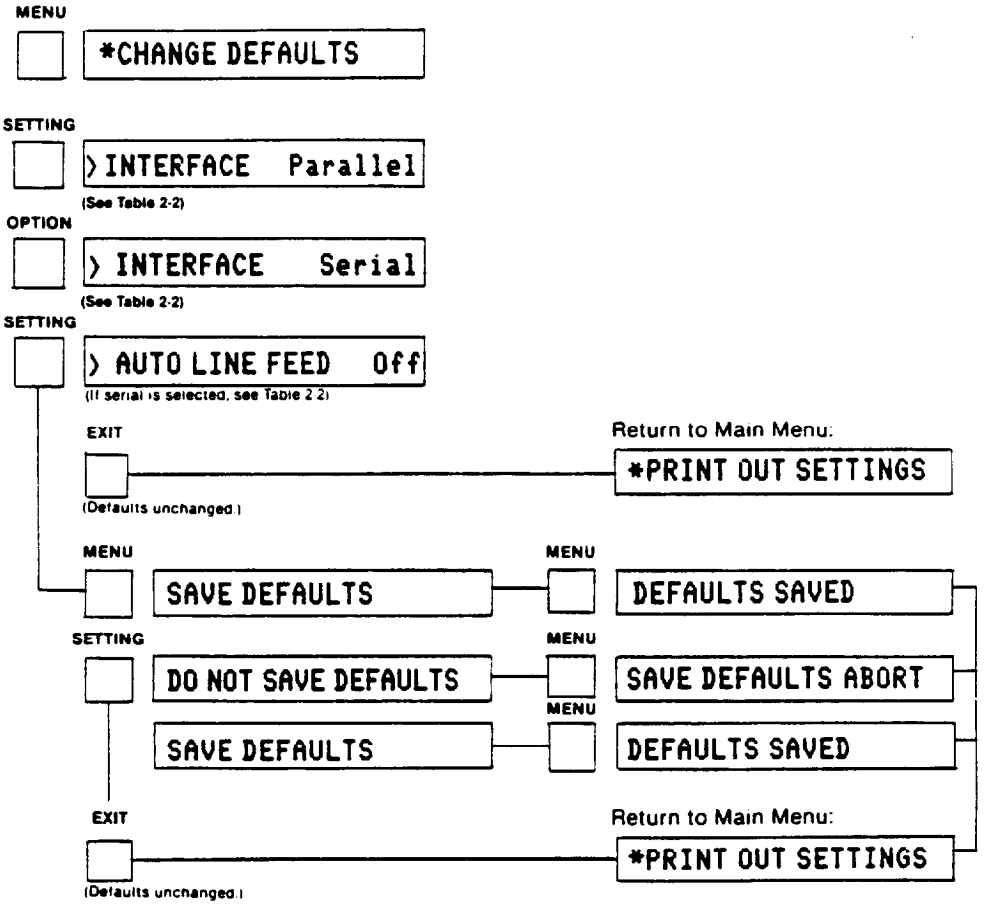
Auto Line feed and SLCT-IN

Most application programs send automatic line feeds at the end of every line, so this option should remain Off. However, if all of the lines are printing on top of each other, change this setting from Off to On.

For most application programs, and most uses, the SLCT-IN setting should remain Valid. This means that the printer cannot be deselected or reselected by the DC1 or DC3 control codes (see Appendix A for further explanation). If it's set to invalid, the printer can be deselected or reselected by DC1 or DC3.

Changing the defaults

To change the default settings, follow these steps.



Setting the top of form position

Finally you need to establish a top of form position so that the printer does not print on the perforations. The top of form position is the position of the paper when the power is turned on. This position is also reset whenever a program initializes the printer or sets the page length.

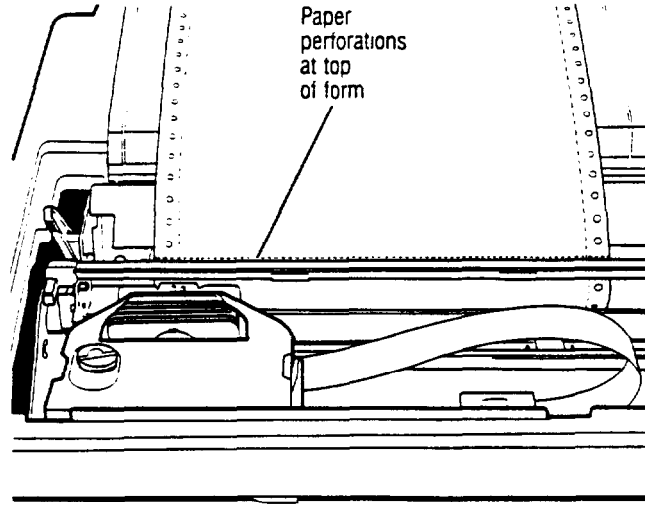
Setting the top of form position is a simple three-step process:

1. See that the printer is turned off.
2. Use the paper feed knob to advance the paper until the first row of perforations is just above the paper bail as shown in Figure 3-6.
3. Turn the printer on.

The printer remembers this position and keeps track of how far the paper has been advanced. This way when you want to move to the top of a new page, it always knows how far to advance the paper.

For some programs, it is more convenient to set the top of form at the top of the print head. Try this if the setting above the paper bail does not work correctly with your program.

figure 3-6.
The top of form setting



Spreadsheets

Although spreadsheets seldom use as many printing styles as word processors, they do have some very specific requirements.

Installation and column width

If your spreadsheet program provides a list of printers, refer to Table 4-1 for the proper priority If your spreadsheet doesn't have a printer setup routine, you should carefully read the program's manual for information on its printing facility

A major concern when printing spreadsheets is the width of the printer. The LQ-2500 is a 136-column printer, which makes it particularly well-suited for spreadsheets. By combining modes and pitches with SelecType, you can have 68 to 272 printable columns (or characters), across a 14-inch page, as shown in Table 4-2.

Table 4-2. LQ-2500 Column Widths

Print Mode/Style	Printable Columns
10 pitch + Double-width	68
10 pitch + Condensed + Double-width	116
10 pitch	136
10 pitch + Condensed	233
12 pitch + Double-width	81
12 pitch + Double-width + Conoensed	136
12 pitch	163
12 Ditch + Condensed	272
15 patch + Double.width	102
15 pitch	204

Printer commands

Unlike word processors, spreadsheet programs don't usually let you place printer commands within a spreadsheet. Instead, one pitch or mode of printing is used for the whole spreadsheet. With the LQ-2500, there are three ways of sending commands to print a spreadsheet.

Proportional spacing is the exception. Only the Roman and Sans Serif fonts have proportional spacing tables. If you select proportional for any other fonts, the printer will print in the selected font, but the results may be uneven.

Table 5-1. Designated pitches and proportional spacing

Draft:	10.	15	
Roman:	10.	15.	Proportional
Sans Serif:	10.	15.	Proportional
Courier:	10.	15	
Prestige:	12		
Script:	10.	15	

Condensed and double-width

In addition to the three pitches and proportional spacing, you can also use condensed and double-width to change character size, as shown in the following printout.

This condensed printing.
This is lo-pitch printing.
T h i s i s d o u b l e - w i d t h .

Condensed is useful for spreadsheets (see Chapter 4) and other applications where its necessary to print the maximum amount of information on a page. There's a separate SelecType setting for condensed to make it easier to print complete documents.

Double-width literally doubles the width of any character, as shown in the above printout. This character size is particularly effective for adding emphasis to titles and headings. To select double-width, use a

Therefore, the graphics mode command uses two numbers for reserving columns.

To figure the number of columns reserved, multiply the second number by 256 and add it to the first number. Since the command is set up for two numbers, you must supply two numbers even if you need only one. When you need fewer than 256 columns, just make *nJ* the number of columns you are reserving and make n2 a zero.

For example, if you wish to send 1632 columns of graphics data, *nl* should be 96 and n2 should be 6 because 1632 = 96 + (6 x 256).

The LQ will interpret the number of bytes determined by *nl* and n2 as graphics data, no matter what codes they are. This means that you must be sure to supply enough bytes of graphics data or the LQ will stop and wait for more **data** and will seem to be locked. If, on the other hand, you supply too much graphics data, the excess will be interpreted and printed as regular text.

First graphics program

This first program is a simple example to show you how the graphics command, column reservation numbers, and data can be used in a BASIC program. Type in and run the following program: be especially careful to include both semicolons. The program produces the printout **you see below** it.

```
10 WIDTH  "LPT1:",255
20 LPRINT  CHR$(27)"+"CHR$(32) CHR$(40) CHR$(0);
30 FOR X=1 TO 120
40 LPRINT CHR$(li'B);
50 NEXT X
```

Line 20 selects single-density 24-pin graphics (mode 32 from Table 6-1) and also reserves 40 columns for graphics. Since 24pin graphics requires three bytes of data for each column, line 30 begins a loop to supply 120 bytes of data. Line 40 contains the number 170 that produces the first pin pattern shown in Figure 6-2, and line 50 finishes the loop.

Table 6-3. Character width limits

	d1 (maximum)	d0 + *dl* + d2 (maximum)
Draft	9	12
Letter Quality, 10 pitch	29	36
Letter Oualty, 12 pitch	23	30
Letter Ouality, 15 pitch	15	24
Proportlonal	39	42

The last part of the character definition is the actual data that defines the dot patterns for each character. Since it takes three bytes to specify the dots in one vertical column of dots, the LQ-2500 expects ***d1 x 3*** bytes of data to follow d2.

An example character definition program should make this clear:

```
10 LRINT  CHR$(27)"x0"
20 LPRINT   CHRS(27)"&"CHR$(0);
30 PRINT "@@?';
40 LPRINT CHR$(l)CHR$(9)CHR$(l);
50 FOR I=1 TO 27
60 READ A: LPRINT CHR$(A);
70 NEXT I
80 LF'RINT  "@@!@"
90 LPRINT   CHR$(27)"X"CHR$(l);
100 PRINT  "@@@@@"
110 LPRINT   CHR$(27)"%"CHR$(0);
120  LPRINT  "@@@@@"
130 END
140 DATA  1,0,0,2,0,0,4,0,0
150 DATA   8,0,0,23,255,240,8,0,0
160 DATA  4,0,0,2,0,0,1,0,0,
```

In line 10, the ESCape ‘x0” command selects draft quality printing.

The actual character definition starts in line 20. The two “at” signs (@) in line 30 represent **nl and 172,** the range of characters being defined (in this case, a range of one). tine 40 contains *dU, dl,* and &.

ASCII	Dec.	Hex.	Description	Page
ESCl	108	6C	Set Left Margin	A-17
E C p	112	70	Turn Proportional Mode On/Off	A-24
ESCr	114	72	Select Printing Color	A-22
ESCs	115	73	Turn Half-speed Mode On/Off	A-8
ESCt	116	74	Select Character Table	A-30
ESCx	120	78	Select Letter Quality or Draft	A-21

ESCJ Perform n/**180-4nch Line Feed**

Format:

ASCII code: ESC J ***n***
Decimal: 27 74 ***n***
Hexadecimal: 1B 4A ***n***

Comments:

Advances the paper ***n/180*** of an inch. The value of ***n*** must be from O-255. This command produces an immediate line feed but does not affect subsequent line spacing and does not produce a carriage return.

Vertical tabbing

VT **Tab Vertically**

Format:

ASCII **code: VT**
Decimal: 11
Hexadecimal: OB

Comments:

Advances the paper to the next **tab** setting in the channel selected **by** ESC 1. If no channel has been **selected,** channel 0 is used. If no vertical tabs have been selected, the paper advances one line.

ESCB **Set Vertical Tabs**

Format:

ASCII code: ESC B ***nl n2 ... ... 0***
Decimal: 27 66 ***nl n2 ... ... 0***
Hexadecimal: IB 42 ***nl n2 ... ... 00***

Comments:

Sets up to 16 vertical tabs in the current line spacing. Tab settings are not affected by subsequent changes in line spacing. The tab settings are entered as ***nl, n2,*** etc., all from 1-255, in ascending order. The ASCII code 0 indicates the end of the command. All settings are stored in channel 0 (see ESC b). ESC B 0 clears the tab settings.

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

Format:

ASCII code:	DC4
Decimal:	20
Hexadecimal:	14

Comments:

Cancels one-line double-width printing selected by SO or ESC SO, but not double-width printing selected by ESC W or ESC !.

ESC w **Turn Double-width Mode On/Off**

Format:

ASCII code:	ESC	W	***n***
Decimal:	27	87	***n***
Hexadecimal:	1B	57	***n***

Comments:

The following values can be used for ***n:***

1: Mode is turned ON.

0: Mode is turned OFF.

Double-width mode doubles the width of all characters.

Print Enhancement

ESC E **Select Emphasized Mode**

Format:

ASCII code:	ESC	E	
Decimal:	27	69	
Hexadecimal:	1B	45	

Comments:

Makes text bolder by printing each dot twice, with the second dot slightly to the right of the first.

Appendix B

ASCII Conversion Chart and Character Tables

This appendix contains an ASCII conversion chart, the LQ-2500 character sets in Roman font only and proportional width tables. See Appendix C for representations of San Serif, Prestige, Courier, and Script character sets.

ASCII Conversion Chart

Decimal	Hexadecimal	Abbreviation	Control key
0	00	(N W	Control-@
	01	(SOH)	Control-A
1	02	(s-m>	Control-B
3	03	**<ETX>**	Control-C
	04	**<EOT>**	Control-D
5	05	**<ENQ>**	Control-E
6	06	(ACK>	Control-F
7	07	(BEL>	Control-G
a	08	(BS>	Control-H
9	09	<HT>	Control-1
10	OA	(LF>	Control-J
11	OB	(VT>	Control-K
12	0C	(ff>	Control-L
13	OD	(CR>	Control-M
14	OE	(SO>	Control-N
15	OF	(SI>	Control-0
16	IO	**(DLE>**	Control-P
17	11	**<Da>**	Control-Q
18	12	**(DC2>**	Control-R
19	13	<DC3>	Control-S
20	14	<DC4>	Control-T
21	15	<NAK>	Control-U
22	16	<SYN>	Control-V
23	17	<Em>	Control-W
24	18	<CAN>	Control-X
25	19	<EM>	Control-Y
26	1A	<SUB>	Control-Z
27	IB	<ESC>	Control-(
28	1C	<F-5>	
29	1D	<GS>	
30	1E	<RS>	
31	1F	<US>	
32	20	<SP>	

Table B-1 Proportional character widths (continued)

Character	Code	Size
l	108	12
m	109	28
n	110	24
o	111	20
p	112	24
q	113	24
r	114	20
s	115	20
t	116	16
u	117	24
v	118	24
w	119	28
x	120	20
v	121	24
z	122	20
{	123	16
|	124	12
}	125	16
~	126	20
°	3	16
▫		20
β		24
0		24
o		20
°°		20
§		20

Character	Code	Size
ü		24
é		20
a		20
à		20
ä		20
ç		20
ê		20
ï		12
Ä		24
Å		24
E		24
æ		28
Æ		28
ô		20
ö		20
ù		24
Ö		24
Ü		28
£		20
¥		24
Pt		28
ñ		24
Ñ		24
¿		20
¡		12

you can see what codes are being sent to the printer. If characters are printable, they appear as their true ASCII characters. Non-printable codes, such as control codes are shown by a dot.

```
16 38 12 1B 50 IB 32 OA OD OA 00 OA OD OA OD OD    .8..P.2.........
41 70 70 65 6E 64 69 78 20 44 20 70 72 65 73 65    Appendix D prese
6E 74 73 20 73 6F 6C 75 74 69 6F 6E 73 20 66 6F    nts solutions fo
72 20 70 6F 73 73 69 62 6C 65 20 70 72 6F 62 6C    r possible probl
```

Find the hex code, 41, at the beginning of the second line. Then find the character, A, at the beginning of the second line in the guide section. The hex code for A is 4 1.

To interpret the non-printable codes, use the ASCII Conversion Chart on the Quick Reference card to find the meaning of the hex code and then look at the Command Summary to find what the control code tells the printer to do.

In the hex dump above, the first hex code, IB, represented by a dot, is the ESC code. It is followed bv hex 38, which is printed as 8. Together, these two codes combine to become ESC 8 which is the control code that tells the printer to ignore the paper-out sensor

The chart below interprets the first six codes for you.

Hex codes	**Command**	**Function**
lB 38	ESC8	Disable paperout sensor
12	DC2	Cancel condensed mode
1B50	ESC P	Select pica pitch
1B 32	ESC2	Select 1 G-inch line spacing
OA		Line Feed
OD	&	Carriage Return

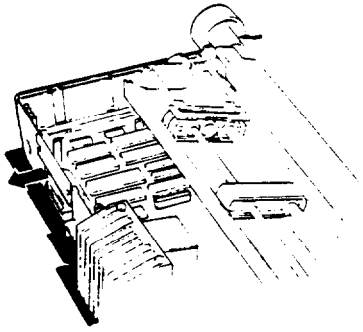
If you find codes in your hex dump that you did not enter in your program or codes you did not expect your application program to send, your computer may be changing the codes before sending them to the printer. You will need to adjust the program.

Hex dump mode can be turned off by turning off the printer: it is also cancelled by an INIT signal from the computer.

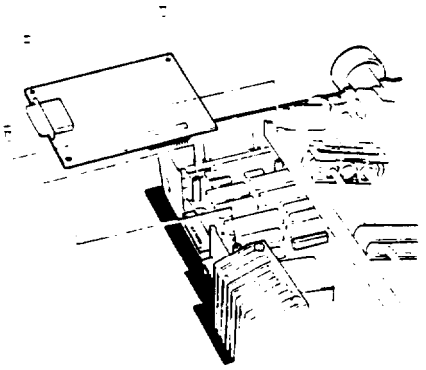
Inserting the Interface Board

1. Remove the upper case of the printer, following the steps described in the previous section.
2. Remove the blanking plate above the parallel connector (as shown in Figure F-5) to allow access to the new interface connector when the case is reassembled.
3. Locate the three supports on which the interface board will rest, and the screw at the rear of the circuit board labelled FG. These are also shown in Figure F-5. The screw marked FG is the connection for the frame ground wire. Connect the frame ground wire before inserting the interface.
4. insert the interface board beneath the printer mechanism, as indicated by the lines in Figure F-6, and plug it into the connector marked CN2 on the main circuit board of the printer.
5. Secure the board to the three supports using the screws provided.
6. Connect the frame ground wire to the ground terminal on the parallel connector, as shown in Figure F-7.
7. Reassemble the printer, reversing the procedure described in the previous section.

Figure F-5.
FG screw and blanking plate



'figure F-6.
Inserting the board



Glossary

Note that these definitions apply specifically to printers. If a word is italicized, see that topic for more information.

Application program
Software designed to perform a specific task, such as word processing or accounting.

ASCII
American Standard Code for information Interchange. A standardized coding system for letters and symbols, it is used by nearly all manufacturers of computers, printers, and software.

Auto line feed
Most computers send automatic line feeds at the end of every line. If all of the lines are printing on top of each other, refer to the Auto Line Feed section under *Change Defaults in Chapter 2.

Automatic sheet feeder
A device that automatically feeds single sheets of paper into a printer. Sometimes called a cut sheet feeder.

Baud rate
A measure of the speed of data transmission. Usually equivalent to bits per second.

Bidirectional printing
Printing in which the print head goes from left to right only on every other line. On the other lines it goes from right to left. This increases the speed of the printing because the head prints in both directions.

Binary
See Number systems.

Bit
A binary digit (0 or 1). The smallest unit used by a printer or computer. *See also Number systems.*

Carriage return
A control code that returns the print position to the left margin. In bidirectional printing the print head may not actually move to the left margin.