

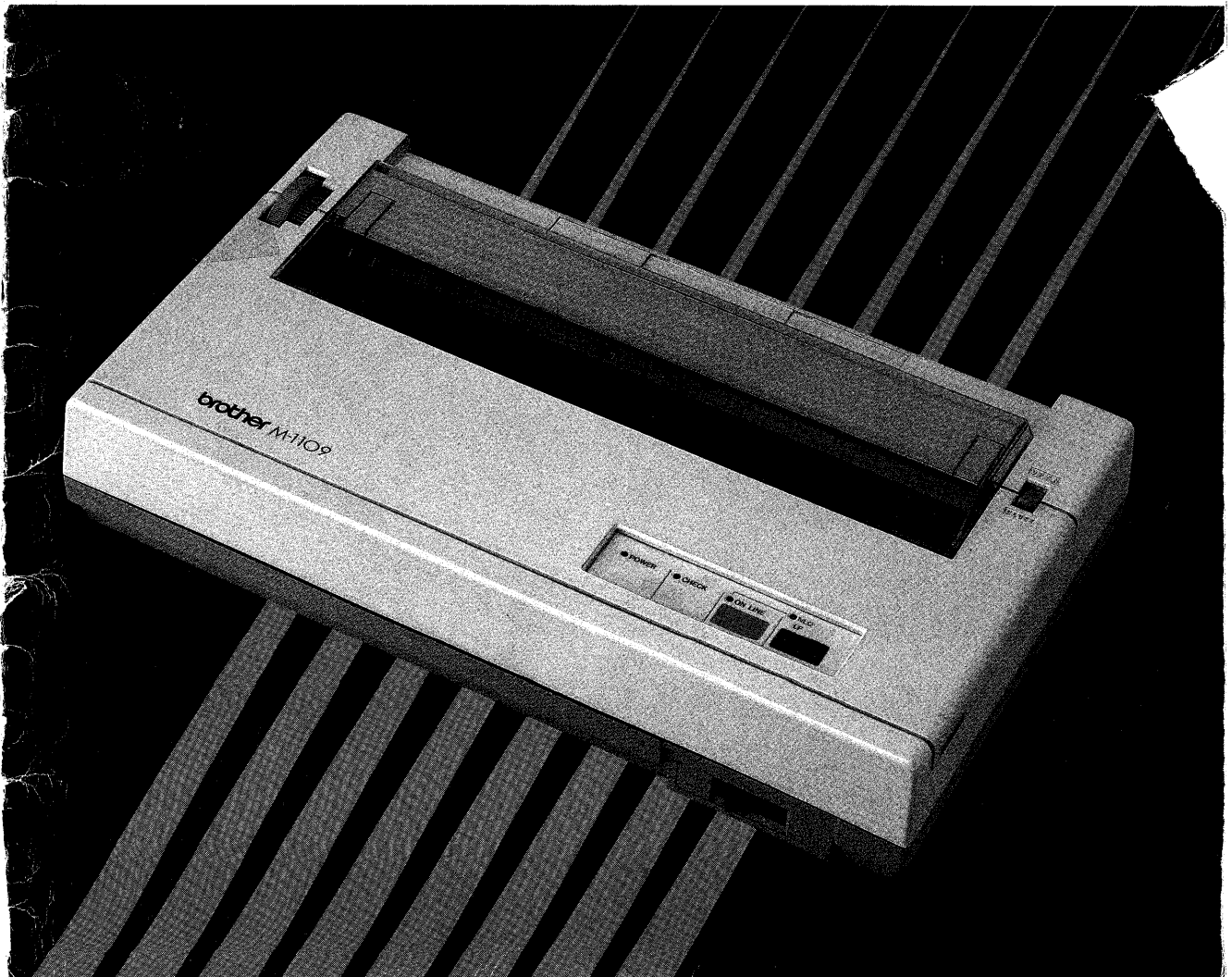
R.H

brother

Impact Dot Matrix Printer

M-1109

Owner's Manual



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publisher.

Specifications are subject to change without prior notice.

Thank you for purchasing this quality Brother product. Please read this manual carefully before operating your printer. It provides valuable tips on operation and information on how to get the most out of the versatility built into every Brother printer.

Note: Always keep this manual in a safe place.

Federal Communications Commission (FCC) Statement

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

“How to Identify and Resolve Radio-TV Interference Problems”. This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

Shield interface cable must be used according to FCC 15.838D.

This statement will be applied only for printers marketed in the U.S.A.

WARNING

This printer contains high voltage components. All repairs should be carried out by qualified personnel only.

INTRODUCTION

Your new Brother M-1109 impact dot matrix personal printer combines high quality and performance features in a compact, lightweight and affordable design that makes it ideal for computer applications for personal or small business use. Its reliability and versatility make it the best choice for a high performance, low-cost printer.

The M-1109 features a miniaturized impact dot print head and a fabric ribbon cassette. It accepts single sheets as well as fanfold or roll paper. (The last two types require the addition of optional feeders; Pin Feed Unit and Roll Paper Holder.) It can also print up to two carbon copies at the same time.

The M-1109 offers two separate modes of operation — Mode I and Mode II — controlled with a DIP Switch. The range of print functions available is thereby widened; fourteen different character sets (including sets for 10 different countries), all 96 ASCII characters, italics, and various print modes.

These character sets may be combined with various print modes: Pica, Elite, Enlarged or Condensed sizes, Emphasized or Double-strike printing, Sub- and Superscripts, Underlined, and NLQ modes. Up to eight or five types of print mode mixing are available in Mode I and Mode II, respectively — even within the same line.

The versatile M-1109 can print bit image data defined byte-wise by the user, in three print densities; Standard, Double, and Quadruple (480, 960 and 1920 dots per 8" line). Also available are four CRT compatible densities (576, 640, 720 and 1152) for graphic applications.

The M-1109 changes line spacing, skips over line perforations, switches between character sets, and adds special print modes — all under program control.

To all these advanced printer features, Brother has added quiet operation (less than 60 dB) and an impressive print speed (100 cps) to make the M-1109 an excellent choice for office or personal use.

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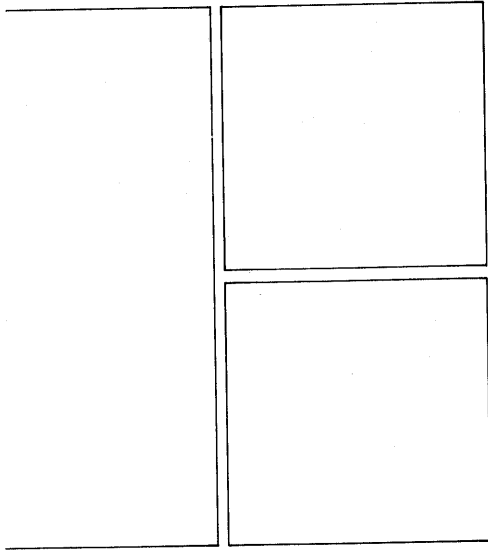
Chapter 1.
CHECKING
CONTENTS

Take your printer out of the carton and check the contents.

- (1) Instruction Manual
- (2) Ribbon Cassette (Disposable)
- (3) Printer
- (4) Carton
- [(5) PF-50 (optional pin feed unit)]

Your printer is shipped with a protective covering over the print head to protect it from shocks during transport. Before installing the ribbon cassette, be sure to remove this covering. (The instructions appear in Section 2.5.)

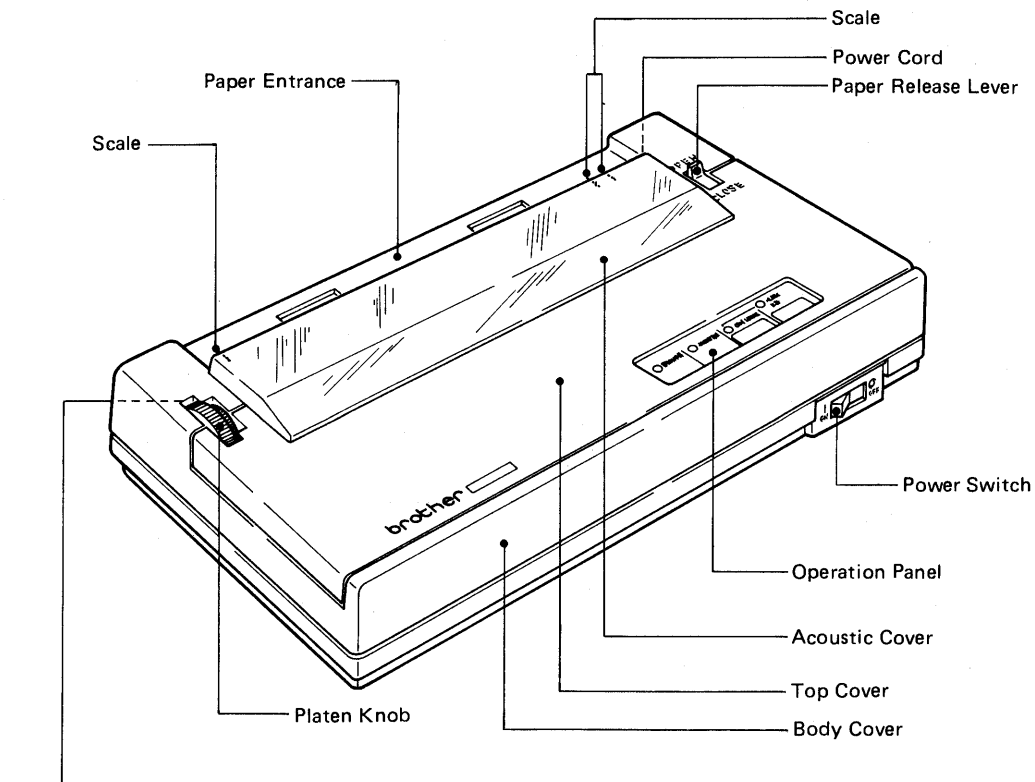
It is recommended that you save all of the packing materials — especially the head protector — for possible future use.



Chapter 2.

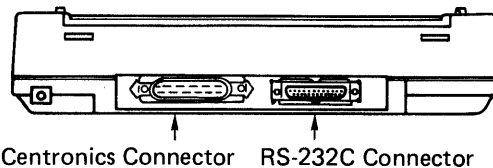
SETTING-UP

2.1 Names of Sections



INTERFACE CONNECTORS

• Parallel & Serial Dual Interface

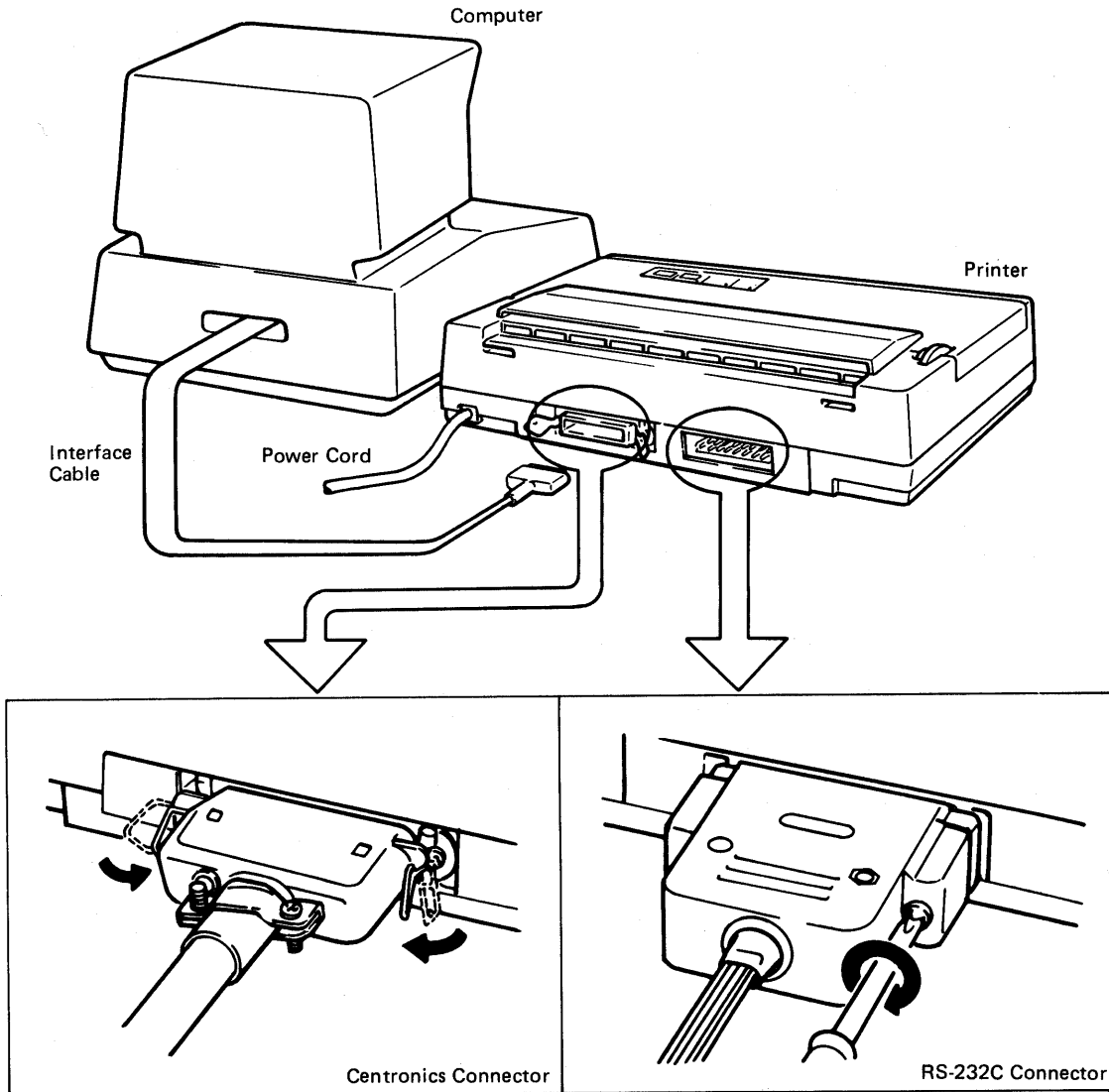


2.2 Site Location

- Place the printer on a flat, firm surface.
- Shield the printer from sources of heat – direct sunlight and heating equipment, for example – humidity, vibration, and electrical noise.
- Do not use the printer in an environment where it may be subjected to wind-borne dust, oil grease, or iron filings.
- Do not use the printer in the same circuit with large electrical motors or other sources of line noise.
- Do not subject the printer to rapid temperature changes or operate it outside the specified temperature range (5°C – 35°C).
- Use only the power supply specified on the rating plate located on the bottom cover. An incorrect voltage or frequency will interfere with operation and damage the electrical components.

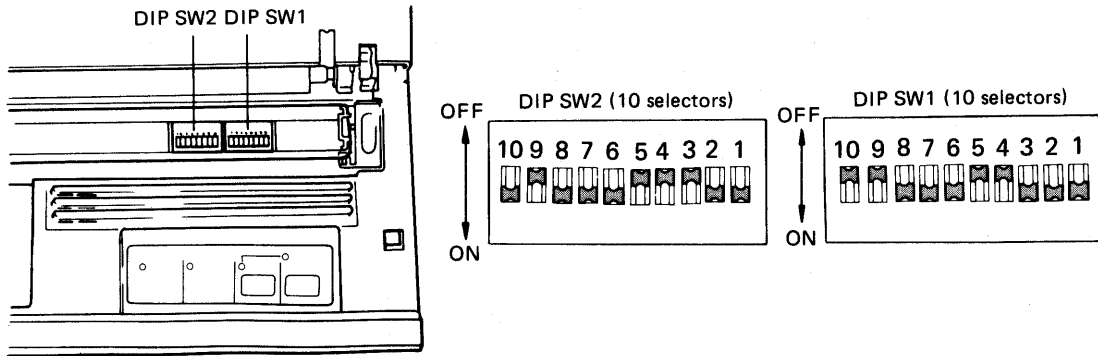
2.3 Connecting to Computer

- (1) Make sure that the printer and computer are turned off.
- (2) Check the AC voltage rating on the bottom cover rating plate matches the AC voltage, and connect the printer's power cord to the AC outlet.
- (3) Connect the interface cable to the printer securely.



2.4 Setting DIP Switches

The Dual In-Line Package (DIP) Switches on the M-1109 control various aspects of printer operation. The printer has two DIP switches, SW1 and SW2. Each of the ten selectors on a DIP SW serves a particular purpose, described on the following pages.



These switches are located on the Logic Control Circuit Board beneath the clear plastic cover under the guide bar and the timing belt.

To change a setting,

- 1) Unplug the power cord from the AC outlet.
- 2) Remove the clear plastic cover.
- 3) Press the selector with tweezers, a small screwdriver, or any similar pointed object.

NOTES:

- The switches have been set at the factory. Do not disturb them unless necessary.
- Always double-check switch and selector numbers.
- Do not let any foreign objects fall onto the circuit board under the plastic cover.
- Do not forget to replace the cover.

SW2-2, selector 2 of SW2, switches the printer between Mode I (ON) and Mode II (OFF)*. When the printer leaves the factory, it is set up for Mode I — that is, with this switch ON. Turning this switch OFF changes to Mode II, a mode which assigns a different set of meanings to the other selectors on SW2 and to the control codes as well. (See pp. 8-9 and Chapter 4. CONTROL COMMANDS.)

*Mode I : Epson-compatible mode
 Mode II : IBM-compatible mode

Printer Buffer Page 22

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Functions of DIP SW1

Selector No.	Function	ON	OFF	As delivered
1	Interface mode & parity	See Table 1.		ON
2				ON
3	X-ON/OFF (NOTES)	Transmit	Not transmit	ON
4	Baud rate	See Table 2.		OFF
5				OFF
6				ON
7	Character code level	8 bits	7 bits	ON
8	Not used.			ON
9	1" Skip perforation	Yes	No	OFF
10	Print mode default setting	NLQ	Draft	OFF

Table 1. Interface Mode & Parity

SW1-Selector No.	Setting			
SW1-1	ON	OFF	ON	OFF
SW1-2	ON	ON	OFF	OFF
Mode & Parity	Parallel	Serial No Parity	Serial Odd Parity	Serial Even Parity

Table 2. Baud Rate

SW1-Selector No.	Setting							
SW1-4	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW1-5	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW1-6	OFF	OFF	OFF	OFF	ON	ON	ON	ON
Baud Rate	110	150	300	600	*1200	2400	4800	9600

* Setting at the factory.

NOTES: 1. All signal lines except X-ON/OFF are not affected by the mode selection of the X-ON/OFF line.
2. X-ON is transmitted at power on if the printer is ready to receive data.

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Functions of DIP SW2

When SW2-2 is set to ON ■ **Mode I**

Selector No.	Function	ON	OFF	As delivered	
1	Form length	11"	12"	ON	
2	Printer mode	Mode I	—	ON	
3	National character set selection	See Table 3 and character set tables in Chap. 5 <i>PAGE 108 → 119</i>		OFF*	
4				OFF	
5				OFF	
6	"0" font selection	0	ø	ON	
7 (Note 1)	Data buffer	Parallel	with data buffer	without data buffer	ON
		Serial	X-ON: 153 bytes	X-ON: 1936 bytes	
8	Not used.			ON	
9 (Note 2)	CR (AUTO FEED XT)	Print with LF	Print without LF	OFF	
10 (Note 3)	SLCT IN	Fixed	Not fixed	ON	

*This selector is set to ON for printers marketed in the countries other than U.S.A.

Table 3. National Character Set Selection

SW2-3	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW2-4	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW2-5	OFF	OFF	OFF	OFF	ON	ON	ON	ON
SW2-selector No. National character set	U.S.A.	England I	Germany	France	England II	Sweden	Italy	Spain

- NOTES:**
1. In serial interface mode, SW2-7 controls X-ON transmission timing. If SW2-7 is set to ON, X-ON is transmitted when the data buffer counts for 153 bytes or less by data transfer to the print buffer; if it is set to OFF, X-ON is transmitted when the data buffer counts for 1936 bytes or less.
 2. In parallel interface mode, Low or High AUTO FEED XT is functionally equivalent to that the SW2-9 is ON or OFF, respectively. However, if the SW2-9 is ON and AUTO FEED XT is High or if the SW2-9 is OFF and AUTO FEED XT is Low, the printer prints and feeds paper by receiving the CR code.
 3. When the SW2-10 is ON, the printer can receive the data if in online mode, and it goes Busy if in offline mode. When the SW2-10 is OFF and SLCT IN is Low, the printer can receive the data if in online mode, and it goes Busy if in offline mode.

<p>ON = EPSON FX 80+</p> <p>LANGUAGES PAGE 78 76 82</p>	<p>OFF = IBM G.P.</p> <p>PAGE 75</p>
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MODE I

MODE II

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When SW2-2 is set to OFF ■ Mode II

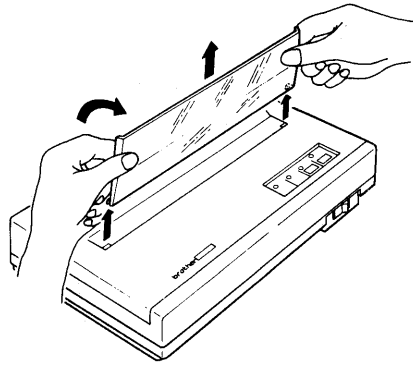
Selector No.	Function	ON	OFF
1	Form length	11"	12"
2	Printer mode	—	Mode II
3	Character set	Character set 1 <i>PAGE 120</i>	Character set 2 <i>PAGE 121</i>
4	CAN	Invalid	Valid
5	LF amount	1/8"	1/6"
6	Buffer full print	With LF	Without LF
7 (Note 1)	Data buffer	Parallel	with data buffer
		Serial	X-ON: 153 bytes
8	Not used.		
9 (Note 2)	CR (AUTO FEED XT)	Print with LF	Print without LF
10 (Note 3)	SLCT IN	Fixed	Not fixed

- NOTES:**
1. In serial interface mode, SW2-7 controls X-ON transmission timing. If SW2-7 is set to ON, X-ON is transmitted when the data buffer counts for 153 bytes or less by data transfer to the print buffer; if it is set to OFF, X-ON is transmitted when the data buffer counts for 1936 bytes or less.
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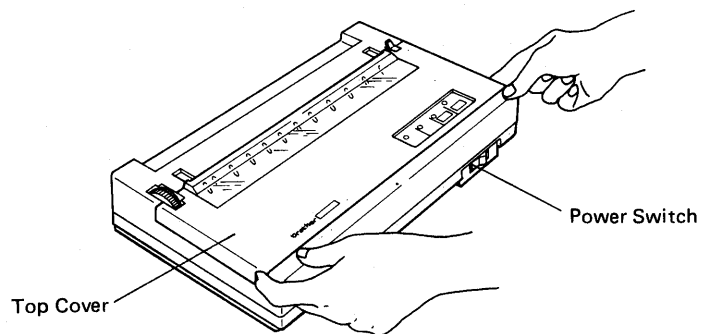
2.5 Installing and Removing Ribbon Cassette

■ Installing

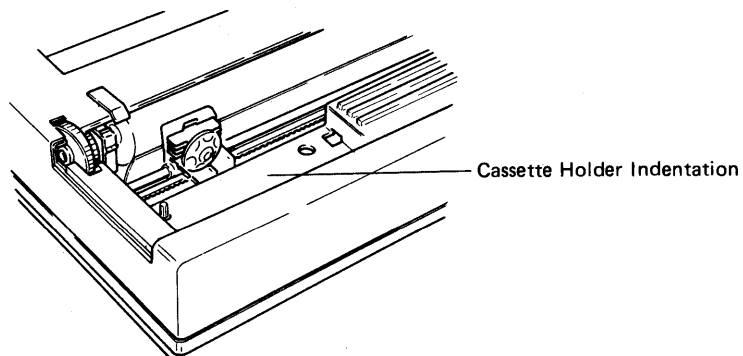
- (1) Confirm that the POWER switch is turned OFF.
- (2) Pivot the acoustic cover up and forward, and then raise it to remove. (if installed)



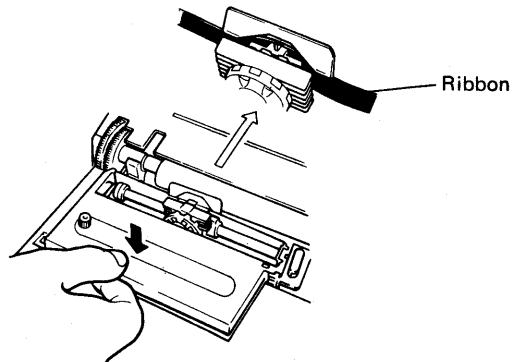
- (3) Remove the top cover by lifting it up at both sides closest to you.



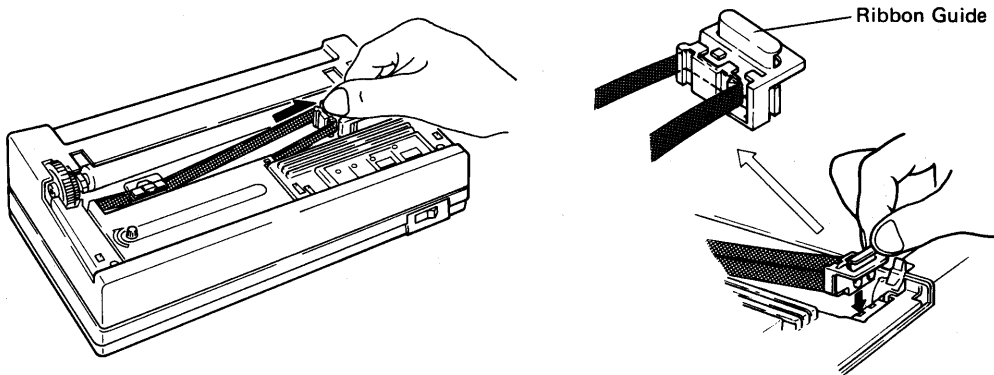
- (4) Take off the head protector which protects the print head from damage due to shocks during transportation. For possible future use, store it.
- (5) Move the print head to the center of the cassette holder indentation on the body cover.



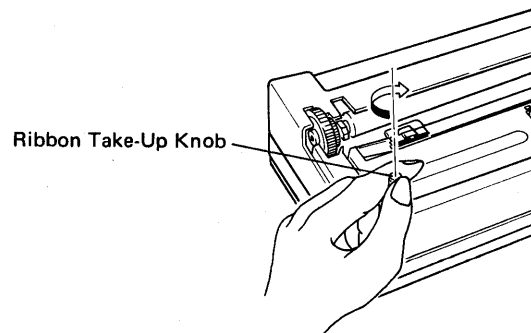
- (6) Place the cassette over the holder, put the ribbon between the carriage and the print head, and then push down the cassette.
- Make sure the ribbon does not twist.



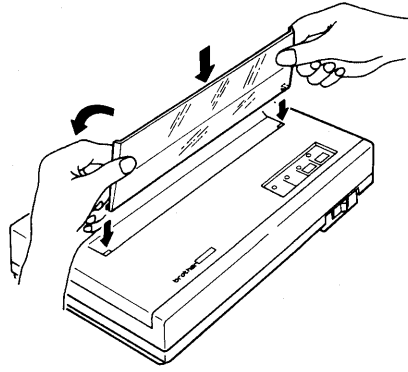
- (7) Pull the ribbon guide from the cassette, move it to the right horizontally, and set it on the printer body cover.
- Make sure that the ribbon is correctly routed in the ribbon guide.



- (8) Turn the ribbon take-up knob to remove the slack.
- Check that the ribbon is correctly placed between the carriage and the print head.

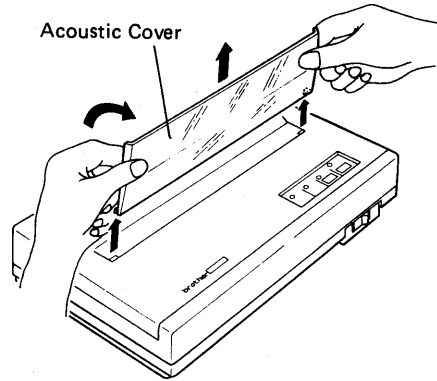


- (9) Reposition the top cover.
- (10) Align the hooks of the acoustic cover with the indentations of the window cover, and pivot it toward the rear of the printer.

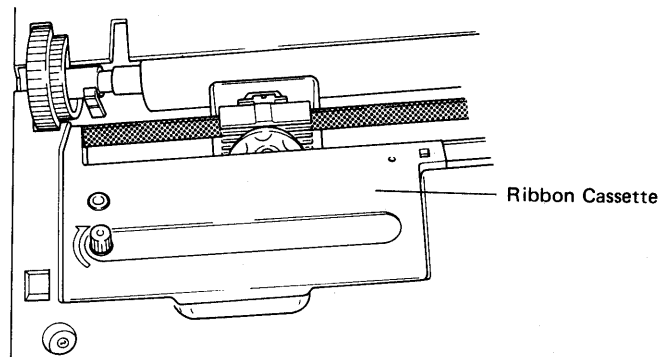


■ Removing

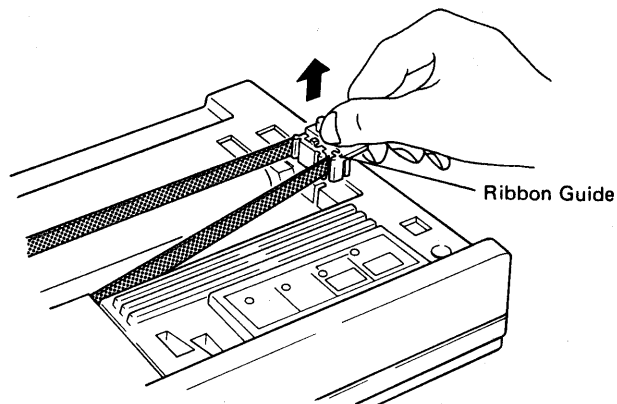
- (1) Turn the POWER switch OFF.
- (2) Pivot the acoustic cover up and forward, and then raise it to remove. (if installed)



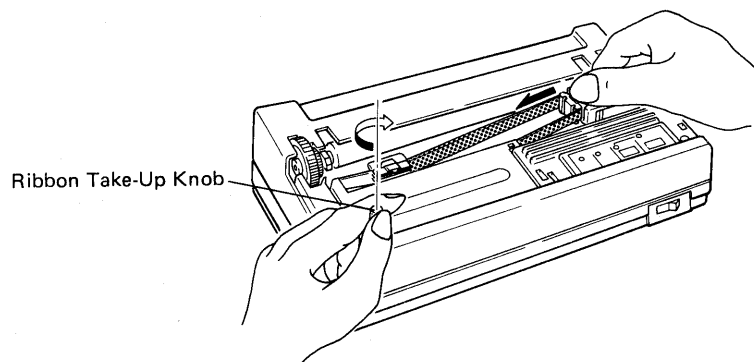
- (3) Remove the top cover.
- (4) Move the print head to the center of the ribbon cassette.



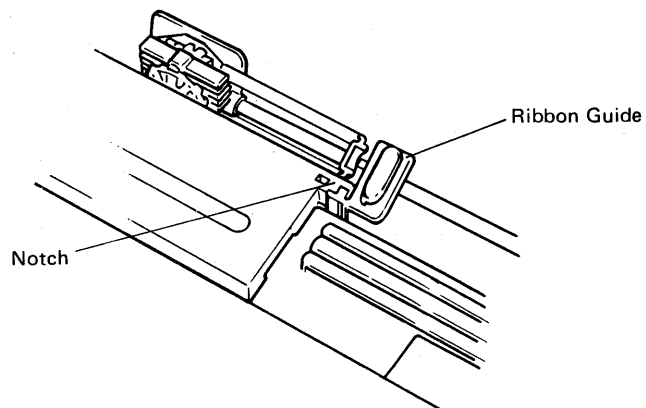
- (5) Lift up the ribbon guide with the right hand.



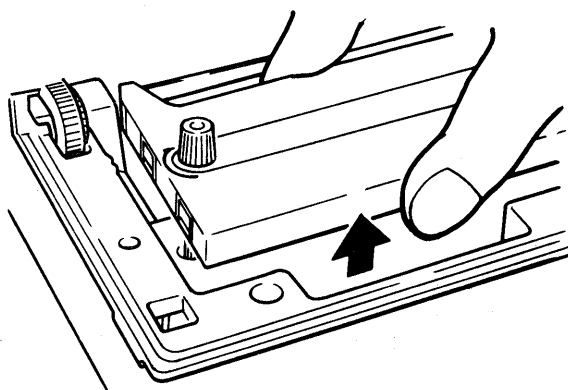
- (6) Turn the ribbon take-up knob clockwise with the left hand to wind up the ribbon until it stops.



- (7) Set the ribbon guide into the notch on the right side of the cassette.

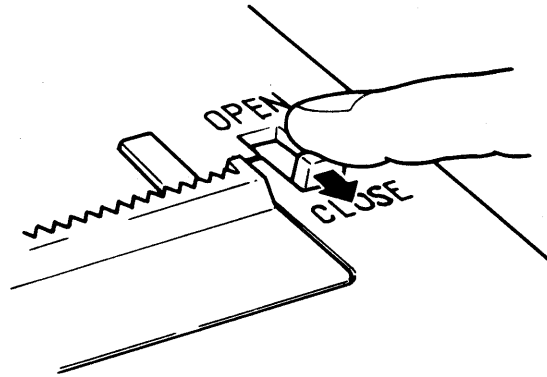


- (8) Lift up the ribbon cassette at the center and remove it from the printer.

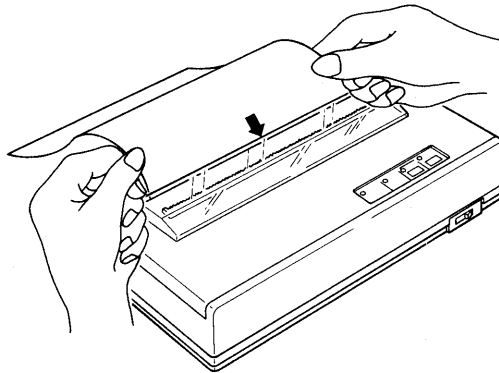


2.6 Loading Cut Forms

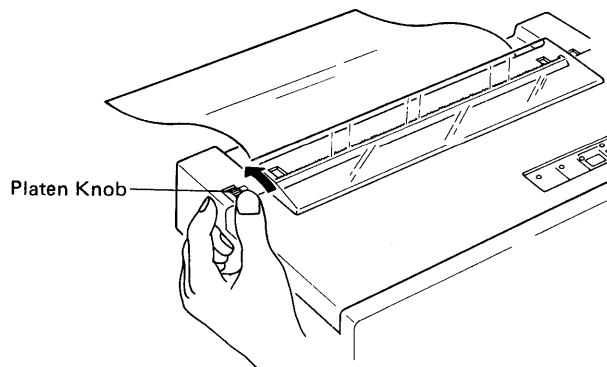
- (1) Set the paper release lever to CLOSE.
 - To make the paper loading easier, the carriage automatically moves to the center of the platen when the power is first applied or when the printer enters the DESELECT state.



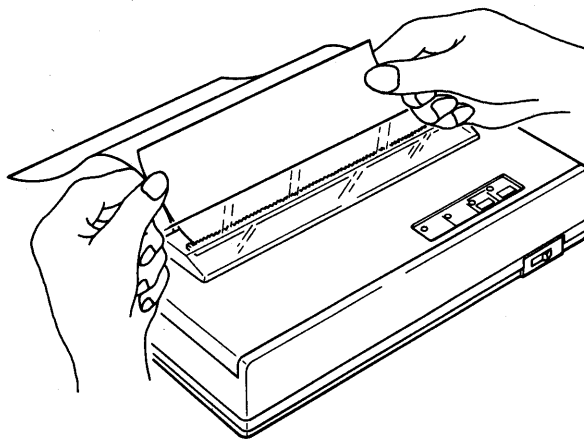
- (2) Insert the paper into the paper entrance at the back of the printer.
 - Load the form, backwards and upside down.
 - Do not use folded, torn or creased forms, as print quality will be affected or the paper may jam in the printer.



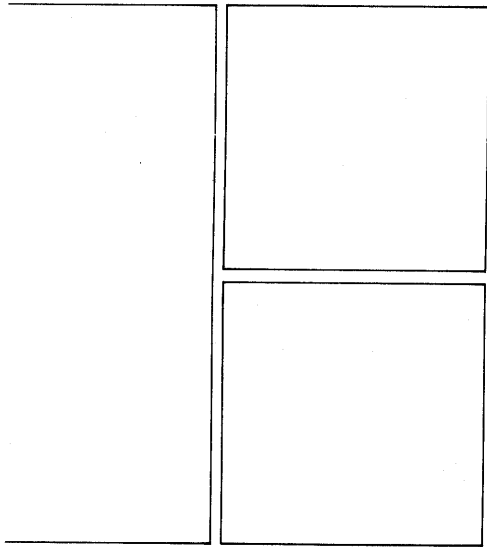
- (3) Turn the platen knob forward to feed the paper until the leading edge comes out.
 - If the paper can not be fed properly, set the paper release lever to OPEN and try again while pushing the paper with hands.



- (4) Set the paper release lever toward OPEN and adjust the paper. While holding the paper aligned, set the left edge of the paper to the left scale.



- (5) Set the paper release lever toward CLOSE and turn the platen knob backward to feed the paper back to the print start position.
- After loading the paper, take the printer offline and press the LF key with the power switch ON to advance the paper one line. This operation ensures the correct spacing between the first and second lines.

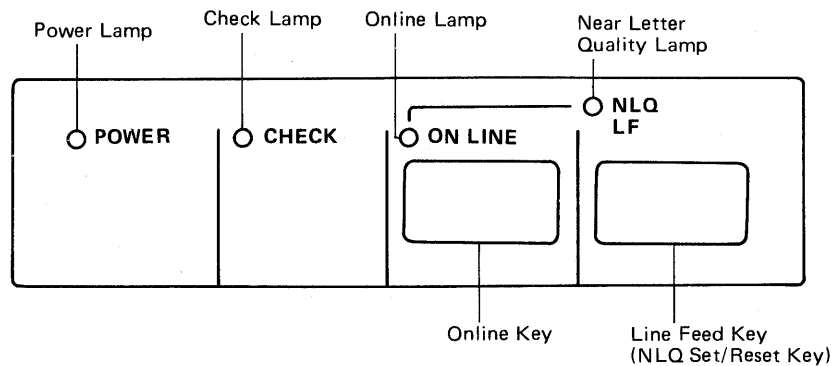


Chapter 3.

OPERATION

3.1 Power Switch and Operation Panel

- **Power Switch** This switch is used to turn power on and off. At power on, the printer performs home positioning. If no paper is loaded or any abnormal carriage condition is detected, the printer becomes offline with CHECK lamp on or blinking on and off, respectively.
- **Operation Panel**



Indicators

● POWER Lamp (Red)

This lamp comes on when the POWER switch is turned ON.

● CHECK Lamp (Red)

This lamp indicates an abnormality in the printer. It comes on when no paper is loaded in the printer, and blinks on and off if any abnormal condition is detected, as shown in the "Error Indication" table on the next page.

● ON LINE Lamp (Green)

This lamp indicates that the printer is in the online mode. When the POWER switch is turned ON, the printer will be placed online to be ready for receiving data.

This lamp goes out or blinks on and off (2.5 times/sec.) if the printer is placed offline when no data exists or data still remains in the data buffer, respectively. Refer to the "Error Indication" table on the next page.

● NLQ (Near Letter Quality) Lamp (Amber)

This lamp lights when the printer is in the NLQ print mode and goes out in the Draft print mode.

Keys

● **ON LINE Key**

At power on, the printer is placed online if no error detected. Each time this key is pressed, the printer enters the offline or online mode alternately.

If this key is pressed while the printer is receiving data, the printer prints the data already input and then turns into the offline mode. At this status, pressing this key allows the printer to start printing on the subsequent print positions.

If this key is pressed while printing, the printer prints the data stored in the print buffer and then turns into the offline mode.

● **LF (Line Feed) Key**

Pressing this key once in the offline mode advances the paper by one line. Continued pressure (for 0.5 sec. min.) produces continuous feeding.

Each time this key is pressed in the online mode, the print mode switches to the NLQ (Near Letter Quality) or Draft print mode alternately.

- NOTES:**
- Turning on the POWER switch with the LF key held down starts the self test. If the self test stops because of Paper Empty (PE) state detected and the carriage moves to the center of the platen, load paper and press the ON LINE key to restart printing of the following test pattern.
 - If the POWER switch is turned ON with both the LF and ON LINE keys held down, the hexadecimal dump function will be performed.

Error Indication

- : light on
- ⊙ : blinking on and off (2.5 times/sec.)
- : blinking on and off (10 times/sec.)

CHECK Lamp	ON LINE Lamp	NLQ Lamp	Errors
○		*	No paper in the printer.
⊙			Motor error
⊙	○	○	Memory error (The RAM fails to pass the initial check.)
●			Transistor error

* Depends on the current print mode selected.

3.2 Performing Self Test

The self test is performed without connection to the computer in order to check the printing function and quality.

- (1) Make sure that the paper is loaded in the printer.
- (2) Turn the POWER switch ON while pressing the LF key, and all characters in the ROM are printed out.

NOTE: The self test is terminated when the POWER switch is turned OFF.

■ Printout

□□□□□□ REV □ DIPSW1-001110\

```
!"#$%&'()*+,-./0123456789:;< \XYZI\J^_`abcdefghijklmnop
qrstuvwxyz{|}~/"#$%&'()*+,-./0 KLMNOPQRSTUVWXYZI\J^_`ab
defghijklmnopqrstuvwxyz{|}~
!"#$%&'()*+,-. (=)>?@ABCDEFGHIJ
KLMNOPQRSTUVWXYZUVW  efghijklmnop
qrstuvwxyz{|}~/" 0123456789:;
=>?@ABCDEFGHIJK YZ I\J^_`abcd
efghijklmnopqrst
!"#$%&'()*+,-./0123456789:; VWXYZI\J^_`abcdefghijklmnop
qrstuvwxyz{|}~/"#$%&'()*+,- HIJKLMNOPQRSTUVWXYZI\J^_`ab
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KLMNOPQRSTUVWXYZI\J^_`abcdefghijklmnopqrst
```

3.3 Hexadecimal Dump and Other Functions

■ Hexadecimal Dump

This diagnostic function prints the data transmitted from the computer in hexadecimal form. The data will be printed at 27 bytes per line in the NLQ or Pica mode.

Turn the POWER switch ON while pressing both the LF and ON LINE keys.

- The moment the buffer becomes full, the hexadecimal dump (print) will start.
- To start the hexadecimal dump (print) before the buffer becomes full, press the ON LINE key again to take the printer offline.

NOTE: To terminate this operation and restore the normal print mode, turn the POWER switch OFF once and then ON again.

**Sample
Program**

```
1 LPRINT CHR$(27); "E"; "HEX .DUMP";  
10 END
```

**Print
Example**

```
1B 45 48 45 58 2E 44 55 4D 50 0D 0A
```

■ Home Positioning

This function automatically returns the carriage to the center of the platen when the power is first applied or the printer enters the DESELECT state.

■ Paper Empty (PE) Detection

When this function detects the end of paper, it lights the CHECK lamp, stops the printing, and switches it offline. To continue printing, load forms and press the ON LINE key. The ON LINE key is disabled until the PE state is cleared unless the Paper Empty Ignore has been set with the ESC 8 command.

After detection of the end of the paper, the printer can continue to print on the following lines for approx. 1/2" – e.g. three more lines at 1/6" line feed pitch – before printing is automatically disabled.

HEX
Dump



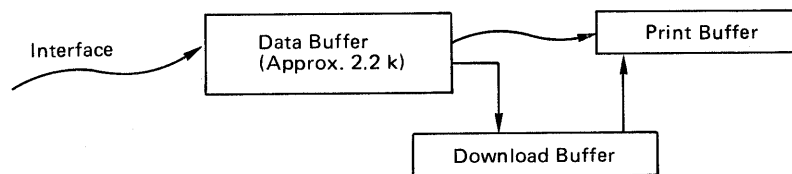
■ Buffer Function

This printer has three buffers; a data buffer, a print buffer, and a download buffer. (The download buffer is available when Mode I is selected.)

The data buffer receives data from the interface as long as it is not full. The moment the print buffer is empty, this buffer transfers the data to the print buffer. Command data will be processed before the transference.

The print buffer with the capacity of 1920 bytes is capable of storing print data for one line. The data transferred from the data buffer is stored as an image data corresponding to each print wire.

These data and print buffers operate asynchronously each other, independently of the receive data or the data length.

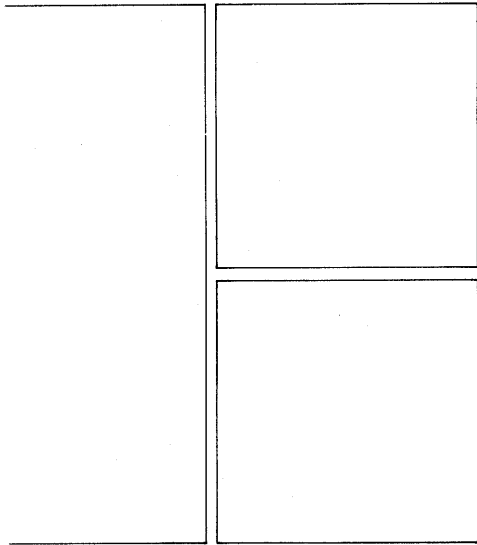


For the description of the download buffer, refer to ESC %, ESC &, and ESC : commands in Chapter 4.

■ Near Letter Quality (NLQ) and Proportional Print Modes

The NLQ characters are formed within an 18-dot high (3.1 mm) by 20-dot wide (2.0 mm) letter frame, by double-strike printing with 1/216" line feed, providing higher quality printout.

In the Proportional print mode, the spacing between characters are in proportion to character width. This mode is effective in the Pica Draft or NLQ print mode. (Note that in the Pica Draft mode, data will be printed in the Emphasized mode.) If Mode II is selected, the Proportional spacing is not available.



Chapter 4.

CONTROL

COMMANDS

To print data on your printer, the software in your computer supporting the Epson FX, IBM PC or its compatible printer must send it to the printer. The popular programming language, BASIC, uses the instruction LPRINT followed a list of the data to be sent. This printer also provides special print modes such as Enlarged or Underlined characters. To take advantage of these enhanced features, you must send one of the special codes listed in the CHARACTER SET TABLES in Chapter 5.

For example, the ASCII control code SO (Shift Out – 14 in decimal or 0E in hexadecimal) switches the printer to Enlarged characters. To send this command to the printer in BASIC, type

```
LPRINT CHR$(14) or LPRINT CHR$(&H0E)
```

As already mentioned in Chapter 2 (See 2.4 Setting DIP Switches), this printer provides two separate modes of operation, each of which assigns slightly different interpretations to the codes used for printer control. To avoid confusion, separate command summary tables are provided on the following pages. Each description is also labelled ■ Mode I or ■ Mode II at the top of the page.

[NOTE] ESC (Escape Sequence)

ESC is to expand the defined characters, alphanumeric, or symbolic characters, to control codes. ESC never expands any control character itself. If any undefined character code is set following ESC, both ESC and the character code are invalid. In the following tables, "n" (or "n_i") or "m" following ESC represents variable value to be specified by the user. It designates specifications concerning data or switching of the mode. For example, in Bit Image mode, "n" specifies the data length. In Underlined mode, "n" switches the mode to set or cancel.

4.1 Command Summary

■ Mode I (DIP SW2-2, ON)

FX80+

Format	Command	Code (Note)		Ref. Page
		Hex.	Dec.	
NUL	Terminate Command	00 (80)	0 (128)	41
BS	Backspace	08 (89)	8 (136)	84
HT	Horizontal TAB	09 (89)	9 (137)	31
LF	Line Feed	0A (8A)	10 (138)	28
VT	Vertical TAB	0B (8B)	11 (139)	32
FF	Form Feed	0C (8C)	12 (140)	30
CR	Carriage Return	0D (8D)	13 (141)	27
SO (Shift Out)	Enlarged Character Mode	0E (8E)	14 (142)	53
SI (Shift In)	Condensed Character Mode	0F (8F)	15 (143)	55
DC2 (Device Control 2)	Cancel Condensed Character Mode	12 (92)	18 (146)	56
DC4 (Device Control 4)	Cancel Enlarged Character Mode	14 (94)	20 (148)	54
CAN	Cancel	18 (98)	24 (152)	86
ESC ! n	Select Multiple Print Mode	1B (9B) 21 n	27 (155) 33 n	68
ESC #	Cancel MSB Control Mode	1B (9B) 23	27 (155) 35	95
ESC % n NUL	Select Internal/Downloaded Character Set	1B (9B) 25 n 00	27 (155) 37 n 0	92
ESC & NUL n m	Define Downloaded Characters	1B (9B) 26 00 n m	27 (155) 38 0 n m	90
ESC * m n ₁ n ₂	Select Bit Image Mode	1B (9B) 2A m n ₁ n ₂	27 (155) 42 m n ₁ n ₂	102
ESC - n	Set/Cancel Underlined Mode	1B (9B) 2D n	27 (155) 45 n	62
ESC / n	Select VFU Channel	1B (9B) 2F n	27 (155) 47 n	38
ESC 0	1/8" Line Spacing	1B (9B) 30	27 (155) 48	48
ESC 1	7/72" Line Spacing	1B (9B) 31	27 (155) 49	49
ESC 2	1/6" Line Spacing	1B (9B) 32	27 (155) 50	45
ESC 3 n	n/216" Line Spacing	1B (9B) 33 n	27 (155) 51 n	50
ESC 4	Italic Print Mode	1B (9B) 34	27 (155) 52	67
ESC 5	Cancel Italic Print Mode	1B (9B) 35	27 (155) 53	67
ESC 6	Expand Printable Character Code Area	1B (9B) 36	27 (155) 54	78
ESC 7	Cancel Expanded Code Area	1B (9B) 37	27 (155) 55	80
ESC 8	Ignore Paper Empty	1B (9B) 38	27 (155) 56	86
ESC 9	Cancel Paper Empty Ignore	1B (9B) 39	27 (155) 57	87
ESC : NUL NUL NUL	Copy Internal Character Set to Download Buffer	1B (9B) 3A 00 00 00	27 (155) 58 0 0 0	93
ESC <	Home Positioning	1B (9B) 3C	27 (155) 60	87
ESC =	Set MSB to 0	1B (9B) 3D	27 (155) 61	94
ESC >	Set MSB to 1	1B (9B) 3E	27 (155) 62	94
ESC @	Printer Initialization	1B (9B) 40	27 (155) 64	88
ESC A n	n/72" Line Spacing	1B (9B) 41 n	27 (155) 65 n	44
ESC B n ₁ n ₂ ... n _k (NUL)	Vertical TAB Setting	1B (9B) 42 n ₁ n ₂ ... n _k 00	27 (155) 66 n ₁ n ₂ ... n _k 0	37
ESC C n	Page Length Setting (No. of Lines)	1B (9B) 43 n	27 (155) 67 n	34
ESC C NUL n	Page Length Setting (In inches)	1B (9B) 43 00 n	27 (155) 67 0 n	34
ESC D n ₁ n ₂ ... n _k (NUL)	Horizontal TAB Setting	1B (9B) 44 n ₁ n ₂ ... n _k 00	27 (155) 68 n ₁ n ₂ ... n _k 0	36
ESC E	Emphasized Character Mode	1B (9B) 45	27 (155) 69	57
ESC F	Cancel Emphasized Character Mode	1B (9B) 46	27 (155) 70	59
ESC G	Double-Strike Character Mode	1B (9B) 47	27 (155) 71	60
ESC H	Cancel Double-Strike Character Mode	1B (9B) 48	27 (155) 72	61
ESC I n	Switch to Control Codes/Printable Characters	1B (9B) 49 n	27 (155) 73 n	82
ESC J n	n/216" Line Feed	1B (9B) 4A n	27 (155) 74 n	33
ESC K n ₁ n ₂	Standard Density Bit Image Mode	1B (9B) 4B n ₁ n ₂	27 (155) 75 n ₁ n ₂	96
ESC L n ₁ n ₂	Double Density Bit Image Mode	1B (9B) 4C n ₁ n ₂	27 (155) 76 n ₁ n ₂	99
ESC M	Elite-Sized Character Mode	1B (9B) 4D	27 (155) 77	64
ESC N n	Set Skip Perforation	1B (9B) 4E n	27 (155) 78 n	42
ESC O	Cancel Skip Perforation	1B (9B) 4F	27 (155) 79	43
ESC P	Cancel Elite-Sized Character Mode	1B (9B) 50	27 (155) 80	65
ESC Q n	Right Margin Setting	1B (9B) 51 n	27 (155) 81 n	52
ESC R n	National Character Set	1B (9B) 52 n	27 (155) 82 n	76
ESC S n	Superscript/Subscript Mode	1B (9B) 53 n	27 (155) 83 n	71
ESC T	Cancel Superscript/Subscript Mode	1B (9B) 54	27 (155) 84	72
ESC U n	Select Unidirectional/Bidirectional Print	1B (9B) 55 n	27 (155) 85 n	75
ESC W n	Set/Cancel Enlarged Character Mode	1B (9B) 57 n	27 (155) 87 n	59
ESC Y n ₁ n ₂	Double Speed & Double Density Bit Image Mode	1B (9B) 59 n ₁ n ₂	27 (155) 89 n ₁ n ₂	100
ESC Z n ₁ n ₂	Quadruple Density Bit Image Mode	1B (9B) 5A n ₁ n ₂	27 (155) 90 n ₁ n ₂	101
ESC b n m ₁ ... m _k ... (NUL)	Set VFU Position	1B (9B) 62 n m ₁ ... m _k ... 00	27 (155) 98 n m ₁ ... m _k ... 0	40
ESC l n	Left Margin Setting	1B (9B) 6C n	27 (155) 108 n	51
ESC p n	Set/Cancel Proportional Spacing	1B (9B) 70 n	27 (155) 112 n	66
ESC s n	Set/Cancel Quieter Print	1B (9B) 73 n	27 (155) 115 n	89
ESC x n	Set/Cancel NLQ Print Mode	1B (9B) 78 n	27 (155) 120 n	73
DEL	Delete	7F (FF)	127 (255)	85

NOTE: Codes in parentheses are interchangeable with the codes without parentheses.

■ Mode II (DIP SW2-2, OFF)

IBM GRAPHIC PRINT

Format	Command	Code (Note)		Ref. Page
		Hex.	Dec.	
NUL	Terminate Command	00 (80)	0 (128)	41
HT	Horizontal TAB	09 (89)	9 (137)	31
LF	Line Feed	0A (8A)	10 (138)	28
VT	Vertical TAB	0B (8B)	11 (139)	32
FF	Form Feed	0C (8C)	12 (140)	30
CR	Carriage Return	0D (8D)	13 (141)	27
SO (Shift Out)	Enlarged Character Mode	0E (8E)	14 (142)	53
SI (Shift In)	Condensed Character Mode	0F (8F)	15 (143)	55
DC2 (Device Control 2)	Cancel Condensed Character Mode	12 (92)	18 (146)	56
DC4 (Device Control 4)	Cancel Enlarged Character Mode	14 (94)	20 (148)	54
CAN	Cancel	18 (98)	24 (152)	86
ESC - n	Set/Cancel Underlined Mode	1B (9B) 2D n	27 (155) 45 n	62
ESC 0	1/8" Line Spacing	1B (9B) 30	27 (155) 48	48
ESC 1	7/72" Line Spacing	1B (9B) 31	27 (155) 49	49
ESC 2	Activate n/72" Line Spacing	1B (9B) 32	27 (155) 50	46
ESC 3 n	n/216" Line Spacing	1B (9B) 33 n	27 (155) 51 n	50
ESC 6	Character Set 2	1B (9B) 36	27 (155) 54	79
ESC 7	Character Set 1	1B (9B) 37	27 (155) 55	81
ESC 8	Ignore Paper Empty	1B (9B) 38	27 (155) 56	86
ESC 9	Cancel Paper Empty Ignore	1B (9B) 39	27 (155) 57	87
ESC <	Home Positioning	1B (9B) 3C	27 (155) 60	87
ESC A n	n/72" Line Spacing	1B (9B) 41 n	27 (155) 65 n	44
ESC C n	Page Length Setting (No. of Lines)	1B (9B) 43 n	27 (155) 67 n	34
ESC C NUL n	Page Length Setting (In inches)	1B (9B) 43 00 n	27 (155) 67 0 n	34
ESC D n ₁ n ₂ ... n _k (NUL)	Horizontal TAB Setting	1B (9B) 44 n ₁ n ₂ ... n _k 00	27 (155) 68 n ₁ n ₂ ... n _k 0	36
ESC E	Emphasized Character Mode	1B (9B) 45	27 (155) 69	57
ESC F	Cancel Emphasized Character Mode	1B (9B) 46	27 (155) 70	59
ESC G	Double-Strike Character Mode	1B (9B) 47	27 (155) 71	60
ESC H	Cancel Double-Strike Character Mode	1B (9B) 48	27 (155) 72	61
ESC J n	n/216" Line Feed	1B (9B) 4A n	27 (155) 74 n	33
ESC K n ₁ n ₂	Standard Density Bit Image Mode	1B (9B) 4B n ₁ n ₂	27 (155) 75 n ₁ n ₂	96
ESC L n ₁ n ₂	Double Density Bit Image Mode	1B (9B) 4C n ₁ n ₂	27 (155) 76 n ₁ n ₂	99
ESC N n	Set Skip Perforation	1B (9B) 4E n	27 (155) 78 n	42
ESC O	Cancel Skip Perforation	1B (9B) 4F	27 (155) 79	43
ESC S n	Superscript/Subscript Mode	1B (9B) 53 n	27 (155) 83 n	71
ESC T	Cancel Superscript/Subscript Mode	1B (9B) 54	27 (155) 84	72
ESC U n	Select Unidirectional/Bidirectional Print	1B (9B) 55 n	27 (155) 85 n	75
ESC W n	Set/Cancel Enlarged Character Mode	1B (9B) 57 n	27 (155) 87 n	59
ESC Y n ₁ n ₂	Double Speed & Double Density Bit Image Mode	1B (9B) 59 n ₁ n ₂	27 (155) 89 n ₁ n ₂	100
ESC Z n ₁ n ₂	Quadruple Density Bit Image Mode	1B (9B) 5A n ₁ n ₂	27 (155) 90 n ₁ n ₂	101
ESC x	Set/Cancel NLQ Print Mode	1B (9B) 78 n	27 (155) 120 n	73

NOTE: Codes in parentheses are available only when Character Set 1 is selected by means of DIP SW2-3.

4.2 Control Commands for Text Print Mode

4.2.1 Print Execution & Format Control Commands

CR

Carriage Return

Format CR

BASIC CHR\$(13);

Hex 0D

Function ■ **Mode I**

Performs printing of all the data stored in the print buffer.

- * A line feed occurs after the printing if AUTO FEED XT signal is Low or the DIP SW2-9 is set to ON.
- * The line feed pitch is set by ESC 0, ESC 1, ESC 2, ESC 3, or ESC A.
- * CR with line feed clears the Enlarged character mode set by SO code.
- * If a CR code only, or a sequence of space data and CR code is received when AUTO FEED XT signal is Low or the DIP SW2-9 is set to ON, a line feed only occurs without movement of the print head.

■ **Mode II**

Performs printing of all the data stored in the print buffer.

- * A line feed occurs after the printing if AUTO FEED XT signal is Low or the DIP SW2-9 is set to ON.
- * The line feed pitch is set by ESC 0, ESC 1, ESC 2, ESC 3, or ESC A.
- * This command clears the Enlarged character mode set by SO code.
- * If a CR code only, or a sequence of space data and CR code is received when AUTO FEED XT signal is Low or the DIP SW2-9 is set to ON, a line feed only occurs without movement of the print head.

Example

```
1 LPRINT "*** CR ***";CHR$(13);CHR$(10);
10 LPRINT
20 LPRINT "CARRIAGE "; "RETURN"
30 LPRINT
40 LPRINT "* CARRIAGE RETURN SET *";CHR$(10);
50 LPRINT
60 LPRINT "CARRIAGE";CHR$(13);CHR$(10); "RETURN";
70 LPRINT CHR$(13);CHR$(10);
80 END
```

```
*** CR ***
```

```
CARRIAGE RETURN
```

```
* CARRIAGE RETURN SET *
```

```
CARRIAGE
RETURN
```

LF

Line Feed

Format

LF

BASIC

CHR\$(10);

Hex

0A

Function**■ Mode I**

Advances paper by one line after printing all the data stored in the print buffer.

- * Line feed spacing is automatically set at 1/6", at power on.
- * The line feed pitch is modified by ESC 0, ESC 1, ESC 2, ESC 3, or ESC A.
- * If an LF code only, or a sequence of space data and LF code is received, a line feed only occurs.
- * If a sequence of data, CR and LF codes is received, the printer performs a line feed after the end of printing.
- * If this line feed operation encroaches on the lines to be skipped, set by ESC N, paper will advance to the first print position of the next page.
- * This code clears the Enlarged character mode set by SO code.

■ Mode II

Advances paper by one line after printing all the data stored in the print buffer.

- * Line feed spacing is automatically set at 1/6" (DIP SW2-5, OFF) or 1/8" (ON), at power on.
- * The line feed pitch is modified by ESC 0, ESC 1, ESC 2, ESC 3, or ESC A.
- * If an LF code only, or a sequence of space data and LF code is received, a line feed only occurs.
- * If a sequence of data, CR and LF codes is received, the printer performs a line feed after the end of printing.
- * If this line feed operation encroaches on the lines to be skipped, set by ESC N, paper will advance to the first print position of the next page.
- * This code clears the Enlarged character mode set by SO code.
- * If the line to be printed contains any special graphic characters of code (176)₁₀ – (223)₁₀ or (244)₁₀ and the line feed spacing is set at less than 1/6", the specified line feed pitch is automatically changed to 1/6" for only that line.

Example

```
1 LPRINT "*** LF ***";CHR$(10);
10 LPRINT "IMPACT DOT MATRIX ";
    "PERSONAL "; "PRINTER"
20 LPRINT "* SET LF *";CHR$(10);
30 LPRINT "IMPACT";CHR$(10);
40 LPRINT "DOT MATRIX";CHR$(10);
50 LPRINT "PERSONAL";CHR$(10);
60 LPRINT "PRINTER";CHR$(13);CHR$(10);
70 END
```

```
*** LF ***
IMPACT DOT MATRIX PERSONAL PRINTER
* SET LF *
IMPACT
DOT MATRIX
PERSONAL
PRINTER
```

FF

Form Feed

Format FF

BASIC CHR\$(12);

Hex 0C

Function ■ **Mode I**

Moves the print position to the top of the next page after printing all the data stored in the print buffer.

- * The default value for form feed is 11 inches (12 inches if DIP SW2-1 is OFF). e.g. 66 lines when 1/6" line feed pitch is selected.
- * The default value is set up when the printer is powered on, reset, or given ESC @.
- * If no data exists in the print buffer when FF code is received, the printer only feeds the form without printing.
- * The form length can be modified by an ESC C sequence.
- * This code clears the Enlarged character mode set by an SO code.

■ **Mode II**

Moves the print position to the top of the next page after printing all the data stored in the print buffer.

- * The default value for form feed is 11 inches (12 inches if DIP SW2-1 is OFF). e.g. 66 lines when 1/6" line feed pitch is selected.
- * The default value is set up when the printer is powered on or reset.
- * The form length can be modified by an ESC C sequence.
- * This code clears the Enlarged character mode set by an SO code.

Example

```
1 LPRINT "*** FF ***";CHR$(10);
10 LPRINT CHR$(27);"C";CHR$(5);
20 LPRINT "* SET SO CODE *";CHR$(10);
30 LPRINT CHR$(14);"ENLARGED MODE";
40 LPRINT CHR$(10);
50 LPRINT "* SET FF CODE *";CHR$(10);
60 LPRINT CHR$(12);"ENLARGED MODE CLE";
70 LPRINT "ARED BY FF CODE";CHR$(10);
80 END
```

```
*** FF ***
* SET SO CODE *
ENLARGED MODE
* SET FF CODE *
```

ENLARGED MODE CLEARED BY FF CODE

HT

Horizontal TAB

Format

HT

BASIC

CHR\$(9);

Hex

09

Function**■ Mode I**

Moves the print position horizontally to the next TAB stop position previously set by an ESC D sequence, after printing all the data stored in the print buffer.

- *The TABs are automatically set every 8 positions in Pica size at power on.
- *When the left margin is shifted by ESC ℓ sequence, the horizontal TAB positions are also shifted correspondingly.
- *Since horizontal TAB positions have been set as absolute values, they are not changed even if another printing pitch is selected.
- *A sequence of n HT codes moves the print position n horizontal TAB positions.

■ Mode II

Moves the print position horizontally to the next TAB stop position previously set by an ESC D sequence.

- *The TABs are automatically set every 8 positions in Pica size at power on.
- *Since horizontal TAB positions have been set not as absolute values but by the number of characters, they are changed depending upon the character size selected.
- *A sequence of n HT codes moves the print position n horizontal TAB positions.

Example

```
1 LPRINT "**** HT ****";CHR$(10);
10 LPRINT "H-TAB1"; "H-TAB2"; "H-TAB3";
20 LPRINT CHR$(10);
30 LPRINT "* SET H-TAB *";CHR$(10);
40 LPRINT CHR$(9); "H-TAB1";
50 LPRINT CHR$(9); "H-TAB2";
60 LPRINT CHR$(9); "H-TAB3";
70 END
```

```
**** HT ****
H-TAB1H-TAB2H-TAB3
* SET H-TAB *
      H-TAB1  H-TAB2  H-TAB3
```

(Depending on the specifications of the computer, CHR\$(9) may not be output.)

VT

Vertical TAB

Format VT

BASIC CHR\$(11);

Hex 0B

Function ■ **Mode I**

Feeds the form to the next vertical TAB position previously set by an ESC B sequence, after printing all the data stored in the print buffer.

* When the printer is initialized or given ESC @, VT = LF.

* If the specified VT amount is equal to or greater than the remaining page length, the form advances to the top of the next page.

* If no vertical TAB positions have been set, this code is functionally equivalent to an LF code.

* This code clears the Enlarged character mode set by an SO code.

* A sequence of n VT codes advances the form n vertical TAB positions.

■ **Mode II**

Functionally equivalent to LF code.

Example

```
1 LPRINT "*** VT ***";CHR$(10);
10 '* SET VERTICAL TAB POSITION *
20 LPRINT CHR$(27);"B";
30 LPRINT CHR$(3);CHR$(7);CHR$(12);CHR$(0);
40 FOR N=1 TO 3
50 '* SET VT CODE *
60 LPRINT CHR$(11);"--- VT";N;"---";
70 NEXT
80 END
```

*** VT ***

--- VT 1 ---

--- VT 2 ---

--- VT 3 ---

ESC J

n/216" Line Feed

Format ESC J n (0 ≤ n ≤ 255)

BASIC CHR\$(27);"J";CHR\$(n);

Hex 1B 4A n

Function ■ **Mode I**

Feeds the form n/216" after printing all the data stored in the print buffer.

- * This sequence does not change line spacing. (See ESC 3.)
- * A specification of n = 0 produces only printing. It does not advance the form.
- * This code does not clear the Enlarged character mode set by an SO code.
- * The carriage does not return after printing. The next character will be printed on the next print position on the new line.

■ **Mode II**

Feeds the form n/216" after printing all the data stored in the print buffer.

- * This sequence does not change line spacing. (See ESC 3.)
- * A specification of n = 0 produces only printing. It does not advance the form.
- * This code does not clear the Enlarged character mode set by an SO code.
- * The carriage returns to the print start position at the left end of the new line after printing.

Example

```
1 LPRINT "*** ESC J n ***";CHR$(10);
10 FOR N=10 TO 100 STEP 40
20 LPRINT CHR$(27);"J";CHR$(N);
30 LPRINT "--LINE FEED";N;"/216 INCH--"
40 NEXT
50 END
```

```
*** ESC J n ***
--LINE FEED 10 /216 INCH--

--LINE FEED 50 /216 INCH--

--LINE FEED 90 /216 INCH--
```

ESC C

Page Length Setting

Format 1 ESC C n (1 ≤ n ≤ 127)

BASIC CHR\$(27);"C";CHR\$(n);

Hex 1B 43 n

Function ■ **Mode I**

Defines the number of lines per form.

- * One page is defined as "n" line length.
- * The top of page position is assumed when this command is received.
- * Since stored as an absolute value, the specified page length is not changed even if the line feed pitch is modified after this setting.
- * This code clears skip perforation mode and vertical TABs previously set.
- * Since the most significant bit is ignored, "n" + 128 is the same as "n".

■ **Mode II**

Defines the number of lines per form.

- * One page is defined as "n" line length.
- * The page length is automatically set to 66 lines when the power is first applied (if DIP SW2-1, ON and SW2-5, OFF).
- * The top of page position is assumed when this command is received.
- * Since stored as an absolute value, the specified page length is not changed even if the line feed pitch is modified after this setting.
- * This code clears skip perforation mode.
- * Since the most significant bit is ignored, "n" + 128 is the same as "n".

Format 2 ESC C NUL n (1 ≤ n ≤ 22)

BASIC CHR\$(27);"C";CHR\$(0);CHR\$(n);

Hex 1B 43 00 n

Function ■ **Mode I**

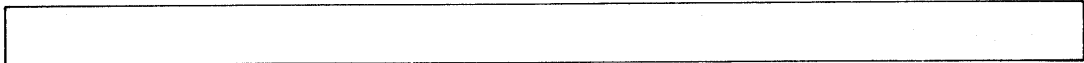
Defines page length in inches.

- * The page length is defined as "n" inches.
- * The top of page position is assumed when this command is received.
- * This code clears skip perforation mode and vertical TABs previously set.
- * Since stored as an absolute value, the specified page length is not changed even if the line feed pitch is modified after this setting.

NOTES

Relation with LF and VT

- When the page length is less than the LF amount:
 - (e.g. LF amount (ESC 3 255) = 1.18 inches
Page length (ESC C NUL 1) = 1 inch)
 - VT code is functionally equivalent to LF code.
 - skip-over perforation settings are ignored.



- When the page length is 0:
 - (e.g. LF amount (ESC 3 0) = 0 inch
Page length (ESC C 1) = 0 inch)
 - LF and VT codes are functionally equivalent to a CR code.
 - skip-over perforation settings are ignored.
- When the page length is greater than the LF amount:
 - VT amount is equivalent to the current LF amount the moment an ESC C sequence is received.

■ **Mode II**

Defines page length in inches.

- * The page length is defined as "n" inches.
- * The top of page position is assumed when this command is received.
- * This code clears skip perforation mode.
- * Since stored as an absolute value, the specified page length is not changed even if the line feed pitch is modified after this setting.

Example

```
1 LPRINT "*** ESC C n ***";CHR$(13);  
  CHR$(10);  
10 LPRINT CHR$(27);"C";CHR$(5);  
20 LPRINT CHR$(27);"N";CHR$(1);  
30 FOR I= 1 TO 5  
40 LPRINT "---- SET PAGE LENGTH ----"  
50 NEXT  
60 END
```

```
*** ESC C n ***  
---- SET PAGE LENGTH ----  
---- SET PAGE LENGTH ----  
---- SET PAGE LENGTH ----  
---- SET PAGE LENGTH ----  
  
---- SET PAGE LENGTH ----
```

ESC D

Horizontal TAB Setting

Format ESC D $n_1 n_2 \dots n_i n_{i+1} \dots n_k$ NUL $(1 \leq n \leq 132)$

BASIC CHR\$(27);"D";CHR\$(n_1);CHR\$(n_2);... CHR\$(n_k);CHR\$(0);

Hex 1B 44 $n_1 n_2 \dots n_k$ 00

Function

■ Mode I

Sets horizontal TAB positions.

- * This command sets horizontal TAB stop positions up to 32 at each " n_i "th print position ($i=1$ to k), and clears all TABs previously set. The TAB function is executed by an HT code.
- * Since these TAB positions are specified as absolute values, the TAB stop values are not changed even if another character size is selected.
- * This setting is terminated by NUL or n_{32} . Reverse order of setting values also terminates this setting.
- * Each " n_i "th position is counted from the left margin when the TAB is executed, not from the leftmost print position.

■ Mode II

Sets horizontal TAB positions.

- * This command sets horizontal TAB stop positions up to 28 at each " n_i "th print position ($i=1$ to k), and clears all TABs previously set. The TAB function is executed by an HT code.
- * Since these TAB positions are specified not as absolute values but by the number of characters, the TAB stop values are changed depending upon the character size selected except for Enlarged characters.
- * This setting is terminated by NUL or n_{28} . Reverse order of setting values also terminates this setting.
- * Each " n_i "th position is counted from the left margin when the TAB is executed, not from the leftmost print position.

Example

```
1 LPRINT "*** ESC D nk O ***";CHR$(10);
10 LPRINT CHR$(9);"H-TAB1";CHR$(9);"H-TAB2";
20 LPRINT CHR$(9);"H-TAB3";CHR$(10);
30 LPRINT "* SET H-TAB POSITION *";CHR$(10);
40 LPRINT CHR$(27);"D";
50 LPRINT CHR$(10);CHR$(22);CHR$(35);CHR$(0);
60 LPRINT CHR$(9);"H-TAB1";CHR$(9);"H-TAB2";
70 LPRINT CHR$(9);"H-TAB3";
80 END
```

```
*** ESC D nk O ***
      H-TAB1 H-TAB2 H-TAB3
* SET H-TAB POSITION *
      H-TAB1      H-TAB2      H-TAB3
```

(Depending on the specifications of the computer, CHR\$(9) may not be output.)

ESC B	Vertical TAB Setting
--------------	----------------------

Format	ESC B $n_1 n_2 \dots n_k$ NUL	($1 \leq n \leq 254$) ($1 \leq k \leq 16$)
---------------	-------------------------------	---

BASIC	CHR\$(27);"B";CHR\$(n_1);CHR\$(n_2); ... CHR\$(n_k);CHR\$(0);
--------------	---

Hex	1B 42 $n_1 n_2 \dots n_k$ 00
------------	------------------------------

Function	<p>Sets vertical TAB positions in line units.</p> <ul style="list-style-type: none"> *This command sets vertical TAB stop positions up to 16 at each "n"th print line. *TAB positions must be set in an ascending order. If n_i is less than n_{i-1}, n_i is ignored. *This TAB setting is terminated when a NUL code is received or "k" exceeds 16. *Since the vertical TAB positions are stored as absolute values obtained by multiplying the number of lines by the current line spacing, they are kept unchanged even if the line spacing is modified after this setting. *This command is used for setting channel 0 independently of the setting by ESC /.
-----------------	---

Example	<pre> 1 LPRINT "*** ESC B nk 0 ***";CHR\$(10); 10 ?* SET PAGE LENGTH * 20 LPRINT CHR\$(27);"C";CHR\$(10); 30 ?* SET VERTICAL TAB POSITION * 40 LPRINT CHR\$(27);"B";CHR\$(3);CHR\$(8); 50 LPRINT CHR\$(10);CHR\$(0); 60 FOR N=1 TO 3 70 LPRINT CHR\$(11);"--- V-TAB";N;"---"; 80 NEXT 90 LPRINT CHR\$(11);"--- NEXT PAGE ---"; 100 END </pre>
----------------	--

*** ESC B nk 0 ***

--- V-TAB 1 ---

--- V-TAB 2 ---

--- V-TAB 3 ---

--- NEXT PAGE ---

ESC /	Select VFU Channel
--------------	--------------------

Format	ESC / n (0 ≤ n ≤ 7)
BASIC	CHR\$(27);"/";CHR\$(n);
Hex	1B 2F n
Function	<p>Designates that a later VT is to be carried out according to VFU (Vertical Format Unit) channel n.</p> <ul style="list-style-type: none"> * TAB positions to be executed by this command must be previously set by an ESC b sequence. * This command and ESC B can not concur.

Example

```

1  LPRINT "*** ESC / n ***";CHR$(10);
10 ?* SET PAGE LENGTH *
20 LPRINT CHR$(27);"C";CHR$(10);
30 ?* SET CHANNEL 1 VFU POSITION *
40 LPRINT CHR$(27);"b";CHR$(1);
50 LPRINT CHR$(3);CHR$(5);CHR$(8);CHR$(0);
60 ?* SET CHANNEL 2 VFU POSITION *
70 LPRINT CHR$(27);"b";CHR$(2);
80 LPRINT CHR$(4);CHR$(6);CHR$(10);CHR$(0);
90 FOR N=1 TO 2
100 LPRINT "*CHANNEL";N;"SELECT*";
110 ?* SELECT VFU CHANNEL *
120 LPRINT CHR$(27);"/";CHR$(N);
130 FOR I=1 TO 3
140 LPRINT CHR$(11);" VT";I
150 NEXT I
160 NEXT N
170 END

```

```

*** ESC / n ***
*CHANNEL 1 SELECT*

```

VT 1

VT 2

```

VT 3
*CHANNEL 2 SELECT*
VT 1

```

VT 2

VT 3

ESC b

Set VFU Position

Format ESC b n m₁ m₂ ... m_k NUL

n : Channel number (0 ≤ n ≤ 7)
m : Position number (1 ≤ k ≤ 16)

BASIC CHR\$(27);"b";CHR\$(n);CHR\$(m₁);CHR\$(m₂) ... CHR\$(m_k);CHR\$(0);

Hex 1B 62 n m₁ m₂ ... m_k 00

Function Sets "m"th position on the "n"th channel of the VFU (Vertical Format Unit).

- * Channel 0 is automatically selected at power on.
- * This setting is the same as that of ESC B.
- * Channel 0 can also be set by an ESC B sequence.
- * "m_i" sequence is terminated by NUL code (i=1 ... k) or m₁₆.

NOTE VFU (Vertical Format Unit) means independent TAB setting for each channel which controls a format. For example, setting VT for designated channels — such as 3, 5 and 15 lines for channel 1 and 5, 10 and 30 lines for channel 2 — is possible.

Example

```
1  LPRINT "*** ESC b n mk 0 ***";CHR$(10);
10 ?* SET PAGE LENGTH *
20 LPRINT CHR$(27);"C";CHR$(10);
30 ?* SET VFU POSITION *
40 LPRINT CHR$(27);"b";CHR$(3);
50 LPRINT CHR$(3);CHR$(5);CHR$(10);CHR$(0);
60 ?* SELECT VFU CHANNEL 3 *
70 LPRINT CHR$(27);"/";CHR$(3);
80 LPRINT "0th line";CHR$(11);
90 LPRINT "3rd line---VT 1";CHR$(11);
100 LPRINT "5th line---VT 2";CHR$(11);
110 LPRINT "10th line---VT 3";CHR$(11);
120 END
```

```
*** ESC b n mk 0 ***
0th line
```

```
3rd line---VT 1
```

```
5th line---VT 2
```

```
10th line---VT 3
```

NUL

Terminate Command

Format

NUL

BASIC

CHR\$(0);

Hex

00

Function

■ Mode I ■ Mode II

Terminates ESC B and ESC D, or switches functions of ESC S and ESC W commands.

ESC N

Set Skip Perforation

Format ESC N n (1 ≤ n ≤ 127)

BASIC CHR\$(27);"N";CHR\$(n);

Hex 1B 4E n

Function ■ Mode I ■ Mode II

Sets skip perforation mode.

- * The last "n" lines on the page are skipped.
- * If n = 0, this command is ignored and previous setting is valid.
- * The value of "n" should not exceed the page length set by an ESC C sequence.
- * Since the skip perforation amount is stored as an absolute value, it is not changed even if the line feed pitch is modified after this setting.
- * If the page length is changed by an ESC C sequence, this mode is cleared. Set the skip perforation amount again.
- * One inch skip perforation is automatically set up at power on, if DIP SW1-9 is set to ON. Since the default value of the page length is 11 inches (with DIP SW2-1 setting ON), the printer prints 60 lines and skips 6 lines. (with DIP SW2-5 setting OFF in Mode II)
- * The 1 inch skip perforation will be cleared by an ESC C sequence.

Example

```
1 LPRINT "*** ESC N n ***"; CHR$(10);
10 LPRINT CHR$(27); "C"; CHR$(5);
20 LPRINT CHR$(27); "N"; CHR$(1);
30 FOR I= 1 TO 5
40 LPRINT "---- SKIP PERFORATION ----"
50 NEXT
60 END
```

```
*** ESC N n ***
---- SKIP PERFORATION ----
---- SKIP PERFORATION ----
---- SKIP PERFORATION ----
---- SKIP PERFORATION ----

---- SKIP PERFORATION ----
```


ESC O

Cancel Skip Perforation

Format ESC O

BASIC CHR\$(27);"O";

Hex 1B 4F

Function ■ **Mode I**

Clears skip perforation mode set by an ESC N sequence.

*This command turns the printer into the same status as at power on or at ESC @ input, if DIP SW1-9 is set to OFF.

*This command clears the default of 1 inch skip perforation automatically set with DIP SW1-9 ON.

■ **Mode II**

Clears skip perforation mode set by an ESC N sequence.

*This command turns the printer into the same status as at power on, if DIP SW1-9 is set to OFF.

*This command clears the default of 1 inch skip perforation automatically set with DIP SW1-9 ON.

Example

```
1   LPRINT "*** ESC O ***";CHR$(10);
10  LPRINT CHR$(27);"C";CHR$(3);
20  LPRINT CHR$(27);"N";CHR$(1);
30  FOR I=1 TO 3
40  LPRINT "----SKIP PERFORATION----"
50  NEXT I
60  LPRINT CHR$(27);"O";
70  LPRINT
80  LPRINT "* ESC O COMMAND SET *";CHR$(13);
    CHR$(10);
90  LPRINT
100 FOR J=1 TO 3
110 LPRINT "----CLEAR SKIP----"
120 NEXT J
130 END
```

```
*** ESC O ***
----SKIP PERFORATION----
----SKIP PERFORATION----

----SKIP PERFORATION----

* ESC O COMMAND SET *

----CLEAR SKIP----
----CLEAR SKIP----
----CLEAR SKIP----
```

ESC A

n/72" Line Spacing

Format

ESC A n

BASIC

CHR\$(27);"A";CHR\$(n);

Hex

1B 41 n

Function**■ Mode I**

Sets line spacing to n/72". ($0 \leq n \leq 85$)

- *When n = 0, LF and VT codes are functionally equivalent to CR codes. The LF key is ignored.
- *When n = 1, the line feed pitch equals the vertical distance between dots in the matrix.
- *Since the most significant bit is ignored, "n" + 128 is the same as "n". Commands with values outside this range ($86 \leq n \leq 127$ and $214 \leq n \leq 255$) are ignored.
- *When the power is first applied, "n" is automatically set to 12. (for a line spacing of 1/6".)

Example

```
1 LPRINT "*** ESC A n ***";CHR$(10);
10 FOR I=5 TO 20 STEP 5
20 LPRINT CHR$(27);"A";CHR$(I);
30 LPRINT "---- ";I;"/72 ----";CHR$(10);
40 NEXT
50 END
```

```
*** ESC A n ***
---- 5 /72 ----
---- 15 /72 ----
---- 20 /72 ----
```

■ Mode II

Sets line spacing to n/72" ($1 \leq n \leq 85$)

- *The form advances by the specified line spacing when the printer receives an ESC 2 sequence.
- *When n = 1, the line feed pitch equals the vertical distance between dots in the matrix.
- *Since the most significant bit is ignored, "n" + 128 is the same as "n". Commands with values outside this range are ignored.
- *When the power is first applied, "n" is automatically set to 12. (for a line spacing of 1/6".)
- *For the sample program and printout, see the description for ESC 2 on page 47.

ESC 2

1/6" Line Spacing

Format ESC 2

BASIC CHR\$(27);"2";

Hex 1B 32

Function Sets line spacing to 1/6".

* After this command is received, the subsequent line spacing is set to 1/6 inch.

* This line feed pitch is automatically set when the printer is initialized.

Example

```
1 LPRINT "*** ESC 2 ***";CHR$(10);
10 LPRINT CHR$(27);"2";
20 FOR N=1 TO 5
30 LPRINT "---- 1/6 INCH LINE FEED ----";CHR$(10);
40 NEXT
50 LPRINT CHR$(13);CHR$(10);
60 END
```

```
*** ESC 2 ***
---- 1/6 INCH LINE FEED ----
---- 1/6 INCH LINE FEED ----
---- 1/6 INCH LINE FEED ----
---- 1/6 INCH LINE FEED ----
---- 1/6 INCH LINE FEED ----
```

ESC 2	Activate n/72" Line Spacing
--------------	-----------------------------

Format

ESC 2

BASIC

CHR\$(27); "2";

Hex

1B 32

Function

Activates ESC A command previously received.

- * If an ESC A has been received, the line feed pitch changes to that specified by the ESC A sequence.
- * This command still takes effect even if the line feed spacing has been changed by other commands after receipt of the ESC A.
- * If there are no ESC A sequences set before this command is received, the line feed spacing is set to 1/6".
- * This command is ignored if the print line contains any special graphic characters not in the Superscript or Subscript mode and the ESC A sequence specified a line spacing of less than 1/6". Instead, the form advances 1/6". The set value is retained.



```

Example 1 LPRINT "*** ESC A n & 2 ***";
           CHR$(10);
10 X$=CHR$(27)
20 FOR I=1 TO 3:READ N
30 LPRINT X$;"A";CHR$(N);X$;"0";
40 LPRINT "--- SET ESC A -> 0(1/8) ---";
           CHR$(10);:NEXT:LPRINT:RESTORE
50 LPRINT "* SET ESC A -> 0 -> 2 *";
           CHR$(10);
60 FOR J=1 TO 3:READ N
70 LPRINT X$;"A";CHR$(N);X$;"0";X$;"2";
80 LPRINT "--- ";N;"/72 INCH FEED ---";
           CHR$(10);:NEXT J:END
90 DATA 6,12,32
    
```

```

*** ESC A n & 2 ***
--- SET ESC A -> 0(1/8) ---
--- SET ESC A -> 0(1/8) ---
--- SET ESC A -> 0(1/8) ---

* SET ESC A -> 0 -> 2 *
--- 6/72 INCH FEED ---
--- 12/72 INCH FEED ---
--- 32 /72 INCH FEED ---
    
```

ESC O (ZERO)

1/8" Line Spacing

Format ESC O

BASIC CHR\$(27); "0";

Hex 1B 30

Function ■ **Mode I**

Sets line spacing to 1/8".

* After this command is received, the subsequent line spacing is set to 1/8 inch until a new line spacing command is received.

■ **Mode II**

Sets line spacing to 1/8".

* After this command is received, the subsequent line spacing is set to 1/8 inch until a new line spacing command is received.

* This command is ignored if the print line contains any special graphic characters not in the Superscript or Subscript mode. Instead, the form advances 1/6". The set value is retained.

Example

```
1 LPRINT "*** ESC O *** ";CHR$(10);
10 LPRINT CHR$(27); "1";:FOR I=1 TO 4
20 LPRINT "---- 7/72 INCH PITCH ----";
   CHR$(10);:NEXT:LPRINT
30 LPRINT "* SET 1/8 INCH *";CHR$(10);
40 LPRINT CHR$(27); "0";:FOR N=1 TO 4
50 LPRINT "---- 1/8 INCH PITCH ----"
60 NEXT:END
```

```
*** ESC O ***
---- 7/72 INCH PITCH ----
---- 7/72 INCH PITCH ----
---- 7/72 INCH PITCH ----
* SET 1/8 INCH *
---- 1/8 INCH PITCH ----
---- 1/8 INCH PITCH ----
---- 1/8 INCH PITCH ----
---- 1/8 INCH PITCH ----
```

ESC 1

7/72" Line Spacing

Format ESC 1

BASIC CHR\$(27);"1";

Hex 1B 31

Function ■ **Mode I**

Sets line spacing to 7/72".

* After this command is received, the subsequent line spacing is set to 7/72 inch until a new line spacing command is received.

* This line spacing pitch makes characters on the current line patch with those on the subsequent line.

■ **Mode II**

Sets line spacing to 7/72".

* After this command is received, the subsequent line spacing is set to 7/72 inch until a new line spacing command is received.

* This line spacing pitch makes characters on the current line patch with those on the subsequent line.

* This command is ignored if the print line contains any special graphic characters not in the Superscript or Subscript mode. Instead, the form advances 1/6". The set value is retained.

Example

```
1   LPRINT "*** ESC 1 ***";CHR$(10);
10  LPRINT CHR$(27);"0";
20  FOR N=1 TO 4
30  LPRINT "---- 1/8 INCH FEED ----";
    CHR$(10);
40  NEXT N
50  LPRINT "* 7/72 INCH FEED SET *";
    CHR$(10);
60  LPRINT CHR$(27);"1";
70  FOR I=1 TO 4
80  LPRINT "----7/72 INCH FEED ----";
    CHR$(10);
90  NEXT I
100 END
```

```
*** ESC 1 ***
---- 1/8 INCH FEED ----
---- 1/8 INCH FEED ----
---- 1/8 INCH FEED ----
---- 1/8 INCH FEED ----
* 7/72 INCH FEED SET *
----7/72 INCH FEED ----
----7/72 INCH FEED ----
----7/72 INCH FEED ----
----7/72 INCH FEED ----
```

ESC 3

n/216" Line Spacing

Format ESC 3 n

BASIC CHR\$(27);"3";CHR\$(n);

Hex 1B 33 n

Function ■ **Mode I** ($0 \leq n \leq 255$)

Sets line spacing to n/216".

* After this command is received, the subsequent line spacing is set to n/216 inch, or n/3 vertical dot pitch.

* This command remains valid until a new line spacing command is received.

* If n = 1 or 2, the paper feed accuracy is not assured.

* If n = 0, LF and VT codes are functionally equivalent to CR codes. The LF key is inoperable.

■ **Mode II** ($1 \leq n \leq 255$)

Sets line spacing to n/216".

* After this command is received, the subsequent line spacing is set to n/216 inch, or n/3 vertical dot pitch.

* This command remains valid until a new line spacing command is received.

* If n = 1 or 2, the paper feed accuracy is not assured.

* This command is ignored if the print line contains any special graphic characters not in the Superscript or Subscript mode and n/216" is less than 1/6". Instead, the form advances 1/6". The set value is retained.

Example

```
1 LPRINT "*** ESC 3 n ***";CHR$(10);
10 FOR I=10 TO 150 STEP 40
20 LPRINT CHR$(27);"3";CHR$(I);
30 LPRINT "---- LINE SPACING";I;
   "/216 INCH ----":NEXT:END
```

```
*** ESC 3 n ***
=== LINE SPACING 50 /216 INCH ===
```

```
--- LINE SPACING 90 /216 INCH ---
```

```
--- LINE SPACING 130 /216 INCH ---
```


ESC *l*

Left Margin Setting

Format ESC *l* n

BASIC CHR\$(27); "l"; CHR\$(n);

Hex 1B 6C n

Function Sets left margin.

- * This command sets the first print position in the current character size.
- * The valid range of "n" depends on the character size as shown below.

	Normal mode	Enlarged mode
Pica-sized character	$0 \leq n \leq 78$	$0 \leq n \leq 39$
Emphasized character		
Condensed character	$0 \leq n \leq 133$	$0 \leq n \leq 66$
Elite-sized character	$0 \leq n \leq 93$	$0 \leq n \leq 46$

- * This command clears the horizontal TAB positions previously set and sets new horizontal TAB positions with the print start position set by this code.
- * This code should be set at the beginning of lines. If not, the data in the print buffer is not assured.
- * For the right margin setting, see ESC O.

Example

```

1 LPRINT "*** ESC l n ***";CHR$(10);
10 FOR I=1 TO 2:LPRINT "1234567890";
20 NEXT:LPRINT CHR$(10);
30 FOR I=1 TO 2:READ X
40 LPRINT CHR$(27);"l";CHR$(X);
50 LPRINT "COLUMN HEAD ";
60 LPRINT CHR$(10);:NEXT
70 END
80 DATA 10,1

```

```

*** ESC l n ***
12345678901234567890
        COLUMN HEAD
        COLUMN HEAD

```

ESC Q	Right Margin Setting
--------------	----------------------

Format

ESC Q n

BASIC

CHR\$(27); "Q"; CHR\$(n);

Hex

1B 51 n

Function

Sets right margin.

- * When this command is received, "n"th print position from the absolute home position is set as a right margin in the current character mode.
- * The valid range of "n" depends on the character size as shown below.

	Normal mode	Enlarged mode
Pica-sized character	$2 \leq n \leq 80$	$1 \leq n \leq 40$
Emphasized character		
Condensed character	$4 \leq n \leq 137$	$2 \leq n \leq 68$
Elite-sized character	$3 \leq n \leq 96$	$2 \leq n \leq 48$

- * Commands with values outside the above range are ignored and the previous setting remains valid.
- * The length of the print line is determined by the current character size multiplied by "n".
- * This code should be set at the beginning of lines. If not, the data already stored in the print buffer is not assured.

Example

```

1  LPRINT "*** ESC Q n ***";CHR$(10);
10 GOSUB 50:LPRINT CHR$(10);CHR$(10);
20 LPRINT CHR$(27);"Q";CHR$(10);
30 GOSUB 50
40 END
50 FOR I=1 TO 3
60 LPRINT "1234567890";
70 NEXT
80 RETURN
    
```

```

*** ESC Q n ***
123456789012345678901234567890
    
```

```

1234567890
1234567890
1234567890
    
```

4.2.2 Print Mode Control Commands

SO (Shift Out)

Enlarged Character Mode

Format SO

BASIC CHR\$(14);

Hex 0E

Function ■ Mode I

Sets Enlarged character print mode.

* After receiving this command, the printer prints the data in horizontally double-width characters until

- DC4, CAN, ESC W (n = 0), or ESC @ is received,
- CR with line feed is received,
- line feed is performed by LF, VT or FF code (except ESC J),
- INIT signal is received, or
- auto line feed is performed by buffer full.

* This command is cleared by carriage return while ESC W is not.

■ Mode II

Sets Enlarged character print mode.

* After receiving this command, the printer prints the data in horizontally double-width characters until

- CR, DC4, CAN, or ESC W (n = 0) is received,
- line feed is performed by LF, VT or FF code (except ESC J),
- INIT signal is received, or
- auto line feed is performed by buffer full.

* This command is cleared by carriage return while ESC W is not.

Example

```
1 LPRINT "*** SO ***";CHR$(10);
10 LPRINT "DOT";
20 LPRINT CHR$(14);" MATRIX";CHR$(20);
30 LPRINT " PRINTER";CHR$(13);CHR$(10);
40 END
```

```
*** SO ***
DOT  MATRIX PRINTER
```

DC 4 (Device Control 4)

Cancel Enlarged Character Mode

Format DC4

BASIC CHR\$(20);

Hex 14

Function ■ Mode I ■ Mode II

Clears the Enlarged character mode set by an SO code.

* This code does not clear the Enlarged character mode set by an ESC W sequence.

Example

```
1 LPRINT "*** DC4 ***";CHR$(10);
10 LPRINT "IMPACT ";CHR$(14);
20 LPRINT "DOT MATRIX ";CHR$(20);
30 LPRINT "PRINTER";CHR$(13);CHR$(10);
40 END
```

```
*** DC4 ***
IMPACT DOT MATRIX PRINTER
```

SI (Shift In)

Condensed Character Mode

Format SI

BASIC CHR\$(15);

Hex 0F

Function ■ **Mode I**

Sets Condensed character print mode.

- * After receiving this command, the printer prints the data in Condensed mode until a DC2 code is received.
- * If the printer receives this command in Pica-sized or Elite-sized character mode, the character pitch becomes 17 or 20 characters/inch, respectively.
- * If this code is used together with an SO or ESC W, the printer prints in Condensed Enlarged character mode (8.5 cpi).
- * If this code is set with an ESC E sequence, this command is ignored since the ESC E command has priority. However, if the Emphasized mode set by ESC E is canceled by an ESC F sequence, the printer turns into the Condensed character mode.
- * The maximum number of printable characters per line is 137.

■ **Mode II**

Sets Condensed character print mode.

- * After receiving this command, the printer prints the data in Condensed mode until a DC2 code is received.
- * If the printer receives this command, the character pitch becomes 17 characters/inch.
- * If this code is used together with an SO or ESC W, the printer prints in Condensed Enlarged character mode (8.5 cpi).
- * If this code is set with an ESC E sequence, this command is ignored since the ESC E command has priority. However, if the Emphasized mode set by ESC E is canceled by an ESC F sequence, the printer turns into the Condensed character mode.
- * The maximum number of printable characters per line is 132.

Example

```
1 LPRINT "*** SI ***";CHR$(13);CHR$(10);
10 X$=CHR$(27)
20 LPRINT X$;"E";"IMPACT ";X$;"F";
30 LPRINT CHR$(15);"DOT MATRIX ";CHR$(18);
40 LPRINT X$;"E";
50 LPRINT CHR$(14);" PRINTER";CHR$(20);
60 LPRINT X$;"F";CHR$(13);CHR$(10);
70 END
```

```
*** SI ***
IMPACT DOT MATRIX PRINTER
```

DC 2 (Device Control 2)

Cancel Condensed Character Mode

Format DC2

BASIC CHR\$(18);

Hex 12

Function ■ Mode I ■ Mode II

Clears the Condensed character mode set by an SI code after printing all the data stored in the print buffer.

* In Emphasized mode, this command clears only the Condensed character mode without printing.

Example

```
1 LPRINT "*** DC2 ***";CHR$(10);
10 A$=CHR$(27)
20 LPRINT CHR$(15);"IMPACT ";CHR$(18);
30 LPRINT A$;"E";CHR$(14);"DOT MATRIX";
   CHR$(20);A$;"F";
40 LPRINT A$;"E";" PRINTER";A$;"F";
50 END
```

```
*** DC2 ***
IMPACT DOT MATRIX PRINTER
```

ESC E

Emphasized Character Mode

Format

ESC E

BASIC

CHR\$(27);"E";

Hex

1B 45

Function**■ Mode I**

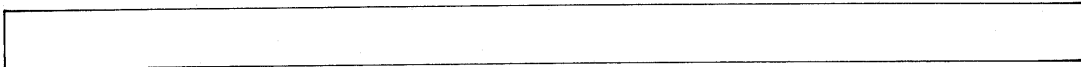
Sets Emphasized character mode after printing all the data stored in the print buffer.

- * This code is not cleared if mixed with other modes.
- * If this code is set with an SI code, the printer prints in this Emphasized character mode and the Condensed character mode is ignored.
- * In the case of mixed use with Enlarged character mode set by an SO code, the printer prints in Emphasized enlarged character mode.
- * If the printer receives this command in Pica-sized character print mode, the printer turns into Emphasized character mode even if it has been in Condensed character mode, since Emphasized mode has priority. When this mode is canceled, the printer returns to the previous Condensed mode.
- * If the printer receives this command in Elite-sized character print mode, this command is ignored and the current print mode is not changed. However, when the Elite-sized character mode is canceled by an ESC P, the printer returns to the Emphasized character mode.
- * This mode is cleared by ESC F sequence.

■ Mode II

Sets Emphasized character mode after printing all the data stored in the print buffer.

- * This code is not cleared if mixed with other modes.
- * If this code is set with an SI code, the printer prints in this Emphasized character mode and the Condensed character mode is ignored.
- * This mode is cleared by ESC F sequence.



Example

```
1 LPRINT "*** ESC E & F ***";CHR$(10);
10 FOR I=1 TO 2
20 LPRINT CHR$(27);"E";:GOSUB 50
30 LPRINT CHR$(27);"F";:GOSUB 50
40 NEXT I:END
50 FOR J=1 TO 12:LPRINT "<*>";:NEXT J
60 LPRINT:RETURN
```

```
*** ESC E & F ***
<*><*><*><*><*><*><*><*><*><*><*><*>
<*><*><*><*><*><*><*><*><*><*><*><*>
<*><*><*><*><*><*><*><*><*><*><*><*>
<*><*><*><*><*><*><*><*><*><*><*><*>
```


ESC G

Double-Strike Character Mode

Format ESC G

BASIC CHR\$(27);"G";

Hex 1B 47

Function ■ **Mode I**

Prints the data in Double-strike character mode.

- * Double-strike is a print method in which the same character is printed twice 1/216" vertically staggered. To maintain absolute vertical positions of characters, the printer automatically adjusts the line feed pitch.
- * This command can be set together with other modes.
- * In the case of mixed use with Superscript/Subscript mode, Superscript/Subscript mode has priority and this command is ignored except that underlines, if any, will be double printed.

■ **Mode II**

Prints the data in Double-strike character mode.

- * Double-strike is a print method in which the same character is printed twice 1/216" vertically staggered. To maintain absolute vertical positions of characters, the printer automatically adjusts the line feed pitch.
- * This command can be set together with other modes.
- * In the case of mixed use with Superscript/Subscript mode, Superscript/Subscript mode has priority and this command is ignored.

Example

```
1 LPRINT "*** ESC G ***";CHR$(10);
10 FOR I=1 TO 4
20 LPRINT CHR$(27);CHR$(71);
30 LPRINT "DOT MATRIX PRINTER";CHR$(10);
40 NEXT
50 END
```

```
*** ESC G ***
DOT MATRIX PRINTER
DOT MATRIX PRINTER
DOT MATRIX PRINTER
DOT MATRIX PRINTER
```

ESC H

Cancel Double-Strike Character Mode

Format ESC H

BASIC CHR\$(27);"H";

Hex 1B 48

Function ■ Mode I ■ Mode II

Clears the Double-strike character mode set by an ESC G sequence after printing all the data stored in the print buffer.

Example

```
1 LPRINT "*** ESC H ***";CHR$(10);
10 FOR I=1 TO 2
20 LPRINT CHR$(27);"G";
30 LPRINT "DOT MATRIX PRINTER";CHR$(10);
40 LPRINT CHR$(27);CHR$(72);
50 LPRINT "DOT MATRIX PRINTER";CHR$(10);
60 NEXT
70 END
```

```
*** ESC H ***
DOT MATRIX PRINTER
DOT MATRIX PRINTER
DOT MATRIX PRINTER
DOT MATRIX PRINTER
```


Example

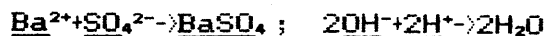
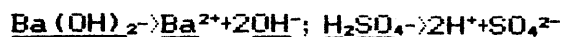
```

1 LPRINT "*** ESC - n ***";CHR$(10);
10 X%=CHR$(27):Y%=CHR$(1):Z%=CHR$(0):
  A%=CHR$(15):LPRINT X%:"-";Y%;
20 LPRINT X%;"E";"Ba(OH)";X%;"F";
30 LPRINT X%;"S";Y%;A%;"2";
40 LPRINT X%;"T";X%;"E";" + H";X%;"F";
50 LPRINT X%;"S";Y%;A%;"2";
60 LPRINT X%;"T";X%;"E";"SO";X%;"F";
70 LPRINT X%;"S";Y%;A%;"4";
80 LPRINT X%;"T";X%;"E";" -> BaSO";
90 LPRINT X%;"F";X%;"S";Y%;A%;"4";
100 LPRINT X%;"T";X%;"E";" + 2H";X%;"F";
110 LPRINT X%;"S";Y%;A%;"2";X%;"T";
120 LPRINT CHR$(18);X%;"E";"O";X%;"F";
130 LPRINT X%;"-" ;Z%;CHR$(10);:LPRINT
140 FOR I=1 TO 6:GOSUB 500:NEXT
150 LPRINT A%;X%;"S";Y%;"2";X%;"T";"->";
160 FOR I=1 TO 2:GOSUB 500:NEXT
170 LPRINT A%;X%;"S";Z%;"2+";X%;"T";
  "+";
180 FOR I=1 TO 3:GOSUB 500:NEXT
190 LPRINT A%;X%;"S";Z%;"-" ;X%;"T";" ; ";
200 GOSUB 500:LPRINT A%;X%;"S";Y%;"2";
210 LPRINT X%;"T";:FOR I=1 TO 2:GOSUB500
220 NEXT:LPRINT A%;X%;"S";Y%;"4";X%;"T";
230 LPRINT "->";:FOR I=1 TO 2:GOSUB 500
240 NEXT:LPRINT A%;X%;"S";Z%;"+" ;X%;"T";
250 LPRINT "+";:FOR I=1 TO 2:GOSUB 500
260 NEXT:LPRINT A%;X%;"S";Y%;"4";X%;"T";

270 LPRINT A%;X%;"S";Z%;"2-";X%;"T";
  CHR$(10);:LPRINT
280 FOR I=1 TO 2:GOSUB 500:NEXT
290 LPRINT A%;X%;"S";Z%;"2+";X%;"T";"+";
300 FOR I=1 TO 2:GOSUB 500:NEXT
310 LPRINT A%;X%;"S";Y%;"4";X%;"T";
320 LPRINT X%;"S";Z%;"2-";X%;"T";"->";
330 FOR I=1 TO 4:GOSUB 500:NEXT
340 LPRINT A%;X%;"S";Y%;"4";X%;"T";
  " ; ";
350 FOR I=1 TO 3:GOSUB 500:NEXT
360 LPRINT A%;X%;"S";Z%;"-" ;
  X%;"T";"+";
370 FOR I=1 TO 2:GOSUB 500:NEXT
380 LPRINT A%;X%;"S";Z%;"+" ;
  X%;"T";"->";
390 FOR I=1 TO 2:GOSUB 500:NEXT
400 LPRINT A%;X%;"S";Y%;"2";X%;"T";
410 GOSUB 500
420 LPRINT CHR$(18);:END
500 READ N:IF N=50 THEN GOTO 510
  ELSE LPRINT X%;"-" ;Y%;
510 LPRINT X%;"E";CHR$(N);X%;"-" ;Z%;
  X%;"F";:RETURN
520 DATA
66,97,40,79,72,41,66,97,50,79,72,72,
83,79,50,72,83,79,66,97,83,79,66,97,
83,79,50,79,72,50,72,50,72,79

```

*** ESC - n ***



ESC M

Elite-Sized Character Mode

Format ESC M

BASIC CHR\$(27);"M";

Hex 1B 4D

Function Prints the data in Elite-sized character mode (12 characters/inch).

* In the case of mixed use with an ESC E command, the printer prints in this Elite-sized character mode, since this mode has priority over the Emphasized character mode set by an ESC E. However, when this mode is canceled by an ESC P, the printer turns to the Emphasized character mode.

Example

```
1 LPRINT "*** ESC M ***";CHR$(10);
10 LPRINT "1234567890 <- PICA SIZED";
    CHR$(10);
20 LPRINT CHR$(27);"M";"1234567890 ";
    "<- ELITE SIZED";CHR$(10);
30 LPRINT CHR$(27);"P";:END
```

```
*** ESC M ***
1234567890 <- PICA SIZED
1234567890 <- ELITE SIZED
```

ESC P

Cancel Elite-Sized Character Mode

Format	ESC P
BASIC	CHR(27);"P";
Hex	1B 50
Function	<p>Clears the Elite-sized character mode set by an ESC M sequence.</p> <ul style="list-style-type: none"> * The printer returns to the Pica-sized character mode. * This command clears only an ESC M sequence and does not affect other modes.

Example	<pre> 1 LPRINT "*** ESC P ***";CHR\$(10); 10 LPRINT CHR\$(27);"M"; 20 LPRINT "ELITE SIZED ";;GOSUB 200 30 LPRINT CHR\$(27);"P"; 40 LPRINT "PICA SIZED ";;GOSUB 200 50 LPRINT CHR\$(15); 60 LPRINT "CONDENSED SIZED ";;GOSUB 200 70 LPRINT CHR\$(27);"M"; 80 LPRINT "ELITE SIZED ";;GOSUB 200 90 LPRINT CHR\$(27);"P"; 100 LPRINT "CONDENSED SIZED ";;GOSUB 200 110 LPRINT CHR\$(18);:END 200 LPRINT "1234567890 ABCDEFGHIJ";CHR\$(10); 210 RETURN </pre>
----------------	---

```

*** ESC P ***
ELITE SIZED 1234567890 ABCDEFGHIJ
PICA SIZED 1234567890 ABCDEFGHIJ
CONDENSED SIZED 1234567890 ABCDEFGHIJ
ELITE SIZED 1234567890 ABCDEFGHIJ
CONDENSED SIZED 1234567890 ABCDEFGHIJ

```


ESC 4

Italic Print Mode

Format ESC 4

BASIC CHR\$(27);"4";

Hex 1B 34

Function Prints the data in italics.

*This is invalid in Bit image mode.

Example

```
1 LPRINT "*** ESC 4 & 5 ***";CHR$(10);
10 GOSUB 50:LPRINT CHR$(27);"4";
20 LPRINT"* SET ITALICS MODE *";CHR$(10);
30 GOSUB 50:LPRINT CHR$(27);"5";
40 LPRINT "* CANCEL ITALICS MODE *";
   CHR$(10);:GOSUB 50:END
50 X=0:FOR I=33 TO 90:LET X=X+1
60 IF X > 40 THEN LPRINT CHR$(10);:X=0
70 LPRINT CHR$(I);:NEXT
80 LPRINT CHR$(10);:RETURN
```

```
*** ESC 4 & 5 ***
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
KLMNOPQRSTUVWXYZ
* SET ITALICS MODE *
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
KLMNOPQRSTUVWXYZ
* CANCEL ITALICS MODE *
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
KLMNOPQRSTUVWXYZ
```

ESC 5

Cancel Italic Print Mode

Format ESC 5

BASIC CHR\$(27);"5";

Hex 1B 35

Function Clears the Italic print mode set by an ESC 4 sequence.

*This command turns the printer into the same status as at power on or at ESC @ input.

Example See ESC 4.

ESC !

Select Multiple Print Mode

Format ESC ! n (0 ≤ n ≤ 255)

BASIC CHR\$(27);"!";CHR\$(n);

Hex 1B 21 n

Function Changes print mode parameters with a single command.

*The print mode parameters are determined by the bit values in "n".

Bit No.	Bit Value		Bit order
	"1"	"0"	
7	Always 0.		2 ⁷
6	Always 0.		2 ⁶
5	Enlarged	—	2 ⁵
4	Double-Strike	—	2 ⁴
3	Emphasized	—	2 ³
2	Condensed	—	2 ²
1	Always 0.		2 ¹
0	Elite	Pica	2 ⁰

- * The printer receives this command with Bit 1, 6, and 7 masked.
- * The print mode combinations available for this command are shown on page 70.
- * This command has priority over other print mode commands.
- * There are priority orders between the print modes specified by n, as shown below.

Emphasized > Condensed > Pica-sized

Superscript/Subscript > Double-strike

- * If this code is set in the NLQ mode, only print modes which can be set together with the NLQ mode are valid. Other specified print modes will be ignored and only the internal flags are set.



Example

```

1  LPRINT "*** ESC ! n ***";CHR$(10);
10 LPRINT CHR$(27);"D";CHR$(12);CHR$(0);
20 FOR N=1 TO 10:READ A
30 LPRINT CHR$(27);"!";CHR$(0);
40 LPRINT "Mode ";A;CHR$(137);
50 '* SELECT MULTIPLE PRINT *
60 LPRINT CHR$(27);"!";CHR$(A);
70 LPRINT "Select Print Mode"
80 NEXT
90 DATA 0,1,4,5,16,21,40,52,53,56
    
```

```

*** ESC ! n ***
Mode 0      Select Print Mode
Mode 1      Select Print Mode
Mode 4      Select Print Mode
Mode 5      Select Print Mode
Mode 16     Select Print Mode
Mode 21     Select Print Mode
Mode 40     Select Print Mode
Mode 52     Select Print Mode
Mode 53     Select Print Mode
Mode 56     Select Print Mode
    
```

Print Mode Combinations Available for ESC !

Value of "n"	En-larged	Double-Strike	Empha-sized	Con-densed	Elite-Sized
0					
1					○
2					
3					○
4				○	
5				○	○
6				○	
7				○	○
8			○		
9					○
10			○		
11					○
12			○		
13				○	○
14			○		
15				○	○
16		○			
17		○			○
18		○			
19		○			○
20		○		○	
21		○		○	○
22		○		○	
23		○		○	○
24		○	○		
25		○			○
26		○	○		
27		○			○
28		○	○		
29		○		○	○
30		○	○		
31		○		○	○

Value of "n"	En-larged	Double-Strike	Empha-sized	Con-densed	Elite-Sized
32	○				
33	○				○
34	○				
35	○				○
36	○			○	
37	○			○	○
38	○			○	
39	○			○	○
40	○		○		
41	○				○
42	○		○		
43	○				○
44	○		○		
45	○			○	○
46	○		○		
47	○			○	○
48	○	○			
49	○	○			○
50	○	○			
51	○	○			○
52	○	○		○	
53	○	○		○	○
54	○	○		○	
55	○	○		○	○
56	○	○	○		
57	○	○			○
58	○	○	○		
59	○	○			○
60	○	○	○		
61	○	○		○	○
62	○	○	○		
63	○	○		○	○

ESC T

Cancel Superscript/Subscript Mode

Format ESC T

BASIC CHR\$(27);"T";

Hex 1B 54

Function ■ Mode I ■ Mode II

Clears the Superscript/Subscript print mode set by an ESC S sequence after printing all the data stored in the print buffer.

Example

```
1 LPRINT "*** ESC S n & T ***";CHR$(10);
10 LPRINT:X#=CHR$(27)
20 LPRINT X#;"E";"EMPHASIZED ";X#;"F";
30 LPRINT X#;"S";CHR$(1);"SUBSCRIPT ";
40 LPRINT CHR$(15);"SUBSCRIPT ";X#"T";CHR$(18);
CHR$(10);:LPRINT
50 LPRINT "NORMAL ";X#"S";CHR$(0);"SUPERSCRIP T ";
60 LPRINT CHR$(15);"SUPERSCRIP T ";
70 LPRINT X#"T";" CONDENSED";CHR$(18);
80 END
```

*** ESC S n & T ***

EMPHASIZED SUBSCRIPT SUBSCRIPT

NORMAL SUPERSCRIP T SUPERSCRIP T CONDENSED

ESC x

Set/Cancel NLQ Print Mode

Format

ESC x n

n = 0 : Cancel

n = 1 : Set

BASIC

CHR\$(27);"x";CHR\$(n);

Hex

1B 78 n

Function

■ Mode I ■ Mode II

Prints the subsequent data with Near Letter Quality (NLQ) fonts, after printing all the data stored in the print buffer.

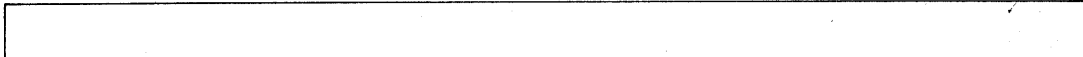
- * The NLQ characters are formed by double-strike printing with 1/216" line feed.
- * In this NLQ mode, the printer prints at 10 characters per inch, and no other sized character is available. However, proportional spacing is possible.
- * This NLQ mode can be set with only Underlined, Superscript/Subscript and Enlarged character modes. If the print modes whose mixed use with the NLQ mode is not available are set together, the printer ignores those modes and prints in the NLQ mode having priority. However, the internal flags for the ignored print modes are affected.
- * Characters having no NLQ font will be just double struck.

Example

```
1  LPRINT "*** ESC x n ***";CHR$(10);
10 LPRINT CHR$(27);"x";CHR$(1);
20 LPRINT "* NLQ MODE *";CHR$(10);
30 GOSUB 100
40 LPRINT
50 LPRINT CHR$(27);"x";CHR$(0);
60 LPRINT "* DRAFT MODE *";CHR$(10);
70 GOSUB 100
80 LPRINT CHR$(27);CHR$(3);
90 END
100 FOR X=33 TO 126
110 IF Y>31 THEN LPRINT CHR$(10);:Y=0
120 LET Y=Y+1:LPRINT CHR$(X);
130 NEXT
140 LPRINT CHR$(10);:Y=0
150 RETURN
```

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

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

Example

```

1   LPRINT "*** ESC R n ***";CHR$(10);
10  LPRINT "< U.S.A   >";X=0:GOSUB 200
20  LPRINT "< FRANCE   >";X=1:GOSUB 200
30  LPRINT "< GERMANY  >";X=2:GOSUB 200
40  LPRINT "<ENGLAND 1>";X=3:GOSUB 200
50  LPRINT "<DENMARK 1>";X=4:GOSUB 200
60  LPRINT "< SWEDEN   >";X=5:GOSUB 200
70  LPRINT "< ITALY    >";X=6:GOSUB 200
80  LPRINT "< SPAIN    >";X=7:GOSUB 200
90  LPRINT "< JAPAN    >";X=8:GOSUB 200
100 LPRINT "< NORWAY   >";X=9:GOSUB 200
110 LPRINT "<DENMARK 2>";X=10:GOSUB 200
120 LPRINT "<ENGLAND 2>";X=11:GOSUB 200
130 END
200 RESTORE 250
210 LPRINT CHR$(27);"R";CHR$(X);
220 FOR I=1 TO 24:READ Y
230 LPRINT CHR$(Y);:NEXT
240 LPRINT CHR$(10);:RETURN
250 DATA
    35,36,64,91,92,93,94,96,123,124,
    125,126,163,164,192,219,220,221,
    222,224,251,252,253,254

```

```

*** ESC R n ***
< U.S.A   >##$@[\]^_{|}~##$@[\]^_{|}~
< FRANCE   >##$à°çš^'éùè"##$à°çš^'éùè"
< GERMANY  >##$äöü^'äöüß##$äöü^'äöüß
<ENGLAND 1>£$@[\]^_{|}~£$@[\]^_{|}~
<DENMARK 1>##$@€ØÅ^'æåä~##$@€ØÅ^'æåä~
< SWEDEN   >##$ÉÄÖÅÜéäöåü##$ÉÄÖÅÜéäöåü
< ITALY    >##$@°\é^ùàòèì##$@°\é^ùàòèì
< SPAIN    >R$@;ñç^'ñ~R$@;ñç^'ñ~
< JAPAN    >##$@[¥]^_{|}~##$@[¥]^_{|}~
< NORWAY   >##$@€ØÅÜéæåü##$@€ØÅÜéæåü
<DENMARK 2>##$@€ØÅÜéæåü##$@€ØÅÜéæåü
<ENGLAND 2>##$@[\]^_£{~##$@[\]^_£{~

```


ESC 6

Character Set 2

Format ESC 6

BASIC CHR\$(27);"6";

Hex 1B 36

Function Selects Character set 2.

Example

```

1  LPRINT "*** ESC 6 ***";CHR$(10);
10 LPRINT "* SELECT CHARACTER SET 2 *";
    CHR$(10);
20 LPRINT CHR$(27);"6";
30 FOR I=1 TO 5
40 READ A:LPRINT CHR$(A);" ";
50 NEXT:LPRINT CHR$(10);
60 DATA 3,4,5,6,21
70 FOR J=128 TO 159
80 IF J=144 THEN LPRINT CHR$(10);
90 LPRINT CHR$(J);" ";
100 NEXT J
110 END

```

```

*** ESC 6 ***
* SELECT CHARACTER SET 2 *
▼ ◆ † ▲ §
Ɔ Ů é ä å à á Ɔ @ è é i i i Å Å
É æ Æ ö ö ò ù y ö Ù † £ ¥ Æ f

```

ESC 7

Cancel Expanded Code Area

Format ESC 7

BASIC CHR\$(27);"7";

Hex 1B 37

Function Clears the expanded code area set by an ESC 6 sequence.

* This command suppresses printing of the printable characters defined in $(128)_{10}$ – $(159)_{10}$ and $(255)_{10}$, making control codes in these areas valid.

Example See ESC 6 in Mode I.

ESC 7

Character Set 1

Format

ESC 7

BASIC

CHR\$(27);"7";

Hex

1B 37

Function

Selects Character set 1.

Example

```

1  LPRINT "*** ESC 6 & 7 ***";CHR$(10);
10 LPRINT "* CHARACTER SET 2 *";CHR$(10);
20 LPRINT CHR$(27);"6";
30 FOR Z=128 TO 159
40 IF Z=144 THEN LPRINT CHR$(10);
50 LPRINT CHR$(Z);" ";
60 NEXT Z:LPRINT CHR$(10);
70 LPRINT "* CHARACTER SET 1 *";CHR$(10);
80 LPRINT CHR$(27);"7";
90 LPRINT CHR$(128);
100 END

```

```

*** ESC 6 & 7 ***
* CHARACTER SET 2 *
Œ Û é ä å à Œ ë è ì í î ï Å Ä
É œ Æ ö ò ù ÿ ü Ÿ £ ¥ Æ £
* CHARACTER SET 1 *

```




Example

```

1  LPRINT "*** ESC I n ***";CHR$(10);
10 '* SWITCH TO PRINTABLE CHARACTERS *
20 LPRINT CHR$(27);"I";CHR$(1);
30 FOR M=1 TO 2
40 FOR N=1 TO 19
50 READ A:LPRINT CHR$(A);
60 NEXT:LPRINT
70 NEXT
80 '* SWITCH TO CONTROL CODES *
90 LPRINT CHR$(27);"I";CHR$(0);:END
100 DATA 0,1,2,3,4,5,6,7,16,17,21
110 DATA 22,23,25,26,28,29,30,31
120 DATA 128,129,130,131,132,133
130 DATA 134,135,144,145,149,150
140 DATA 151,153,154,156,157,158,159

```

```

*** ESC I n ***
àèùòì*£$B$`AUäÜéé¥
àèùòì*£$B$`AUäÜéé¥

```

4.2.3 Miscellaneous Commands

■ Mode I

BS

Backspace

Format BS

BASIC CHR\$(8);

Hex 08

Function Moves the print position horizontally one position to the left, in the current character size, after printing all the data stored in the print buffer.

- * In Enlarged character mode, the print position backspaces in double Pica pitch.
- * This command never moves the print position to the left more than the home position. If the printer receives this command at home position, the command is ignored and does not move the print position to the left.
- * This command is invalid in the Proportional print mode.

Example

```
1 LPRINT "*** BS ***";CHR$(10);
10 LPRINT "12345678901234567";CHR$(10);
20 LPRINT ">>>>><<<<<";CHR$(10);
30 LPRINT "* SET BS COMMAND *";CHR$(10);
40 GOSUB 80
50 LPRINT CHR$(14);:GOSUB 80
60 LPRINT CHR$(20);
70 END
80 LPRINT ">>>>>";CHR$(8);CHR$(8);"<<<<<";
  CHR$(10);
90 RETURN
```

```
*** BS ***
12345678901234567
>>>>><<<<<
* SET BS COMMAND *
>>>>><<<<<
>>>>> <<<<<
```

DEL	Delete
------------	--------

Format DEL

BASIC CHR\$(127);

Hex 7F

Function Deletes the last one character stored in the print buffer.

- * This command is ignored in Bit image print mode.
- * This command does not change the current print mode.

Example

```

1  LPRINT "*** DEL ***";CHR$(10);
10 GOSUB 300:FOR I=65 TO 90
20  LPRINT CHR$(I);:NEXT:LPRINT CHR$(10);
30  I=64
40  FOR J=1 TO 2
50  I=I+1:LPRINT CHR$(I);:NEXT J
60  LPRINT CHR$(127);CHR$(32);
70  IF I=90 THEN LPRINT CHR$(10);
    :GOSUB 300 ELSE GOTO 40
80  LPRINT "UNITED NATIONS EDUCATIONAL,"
    "SCIENTIFIC, ";CHR$(10);
90  LPRINT "AND CULTURAL ORGANIZATION";
    " => ";
100 LPRINT "UNITED";:X=5:GOSUB 200
110 LPRINT "NATIONS";:X=6:GOSUB 200
120 LPRINT "EDUCATIONAL";:X=10:GOSUB 200
130 LPRINT "SCIENTIFIC";:X=9:GOSUB 200
140 LPRINT "CULTURAL";:X=7:GOSUB 200
150 LPRINT "ORGANIZATION";:X=11
    :GOSUB 200
160 LPRINT CHR$(10);:GOSUB 300:END
200 FOR K=1 TO X:LPRINT CHR$(127);:NEXT
220 RETURN
300 FOR L=1 TO 38:LPRINT "-";:NEXT
310 LPRINT CHR$(10);:RETURN

```

*** DEL ***

 ABCDEFGHIJKLMNOPQRSTUVWXYZ
 A C E G I K M O Q S U W Y

UNITED NATIONS EDUCATIONAL, SCIENTIFIC,
 AND CULTURAL ORGANIZATION => UNESCO

CAN

Cancel

Format CAN

BASIC CHR\$(24);

Hex 18

Function ■ Mode I ■ Mode II

Clears the data in the print buffer.

*This command does not clear control codes except SO.

Example

```
1 LPRINT "*** CAN ***";CHR$(10);
10 LPRINT CHR$(14); "ENLARGED MODE";
    CHR$(10);
20 LPRINT CHR$(24); "ENLARGED MODE";
    CHR$(10); :LPRINT
30 LPRINT CHR$(15); "CONDENSED MODE";
    CHR$(10);
40 LPRINT CHR$(24); "CONDENSED MODE";
    CHR$(10);CHR$(18);
50 END
```

*** CAN ***

ENLARGED MODE
ENLARGED MODE

CONDENSED MODE
CONDENSED MODE

ESC 8

Ignore Paper Empty

Format ESC 8

BASIC CHR\$(27);"8";

Hex 1B 38

Function ■ Mode I ■ Mode II

Causes the printer to ignore the Paper Empty (PE) state.

* This command allows the printer to keep online and print to the end of the paper.
However this command does not disable the PE detection function completely;
that is, the CHECK lamp comes on and the PE signal is output.

ESC 9

Cancel Paper Empty Ignore

Format ESC 9

BASIC CHR\$(27);"9";

Hex 1B 39

Function ■ Mode I ■ Mode II

Clears the Paper Empty Ignore condition set by an ESC 8 sequence.

- * This command activates PE detection function.
- * This mode is automatically set when the printer is initialized.
- * If this command is received in the Paper Empty Ignore state, the printer outputs FAULT and BUSY signals.

ESC <

Home Positioning

Format ESC <

BASIC CHR\$(27);"<";

Hex 1B 3C

Function ■ Mode I ■ Mode II

Returns the print head to its home position, after printing all the data stored in the print buffer.

- * Subsequent data will be printed, from left to right, starting at the print position following the data previously printed.
- * See ESC U sequence.

ESC @

Printer Initialization

Format ESC @

BASIC CHR\$(27);"@";

Hex 1B 40

Function Initializes the printer.

- *When receiving this command, the printer returns to the same status as at power on.
- *This command clears the data in the print buffer.

Example

```

1   LPRINT "*** ESC @ ***";CHR$(10);
10  LPRINT "ABCDEFGHJKLM";CHR$(10);
20  LPRINT "abcdefghijklm";CHR$(27);"@";
30  LPRINT "ABCDEFGHJKLM";CHR$(10);
40  END
50  LPRINT CHR$(27);"5";
    "* CANCEL ITALICS MODE *";CHR$(10);
60  GOSUB 100
70  END
100 X=0
110 FOR I=33 TO 126:LET X=X+1
120 IF X > 40 THEN LPRINT CHR$(10);:X=0
130 LPRINT CHR$(I);:NEXT
140 LPRINT CHR$(10);:RETURN

```

```

*** ESC @ ***
ABCDEFGHJKLM
ABCDEFGHJKLM

```




Example

```

1  LPRINT "*** ESC & O n m ***";CHR$(10);
10 '* DEFINE DOWNLOADED CHARACTER *
20 LPRINT CHR$(27);"&";CHR$(0);"DD";
30 LPRINT CHR$(139);
40 LPRINT CHR$(8);CHR$(16);CHR$(40);CHR$(64);
50 LPRINT CHR$(191);CHR$(64);CHR$(40);CHR$(16);
60 LPRINT CHR$(8);CHR$(0);CHR$(0);
70 LPRINT "--DOWNLOADED CHARACTER--"
80 '* SELECT DOWNLOADED CHARACTER *
90 LPRINT CHR$(27);"%";CHR$(1);CHR$(0)
100 LPRINT "      DDDDDDDDDDDDD"
110 LPRINT CHR$(27);"%";CHR$(0);CHR$(0);
120 END

```

```

*** ESC & O n m ***
--DOWNLOADED CHARACTER--

```

```

↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑↑

```

ESC %

Select Internal/Downloaded Character Set

Format

ESC % n NUL

n = 0 : Internal character set
n = 1 : Downloaded character set

BASIC

CHR\$(27);"%";CHR\$(n);CHR\$(0);

Hex

1B 25 n 00

Function

Selects the internal or downloaded character set by "n".

- * The internal character set is automatically selected when the power is first applied.
- * If no downloaded characters have been defined, the printer automatically selects the internal character set.
- * If this command with n = 1 is set with the NLQ mode, only the internal flag for this command is set and the printer prints with NLQ fonts.

Example

```

1  LPRINT "*** ESC % n 0 ***";CHR$(10);
10 ' * DEFINE DOWNLOADED CHARACTER *
20 LPRINT CHR$(27);"&";CHR$(0);CHR$(68);
   CHR$(68);
30 LPRINT CHR$(139);
40 LPRINT CHR$(8);CHR$(16);CHR$(40);CHR$(64);
50 LPRINT CHR$(191);CHR$(64);CHR$(40);CHR$(16);
60 LPRINT CHR$(8);CHR$(0);CHR$(0);
70 LPRINT "--INTERNAL CHARACTER--"
80 ' * SELECT INTERNAL CHARACTER *
90 LPRINT CHR$(27);"%";CHR$(0);CHR$(0)
100 LPRINT "      DDDDDDDDDDDDD"
110 LPRINT
120 LPRINT "--DOWNLOADED CHARACTER--"
130 ' : SELECT DOWNLOADED CHARACTER *
140 LPRINT CHR$(27);"%";CHR$(1);CHR$(0)
150 LPRINT "      DDDDDDDDDDDDD"
160 LPRINT CHR$(27);"%";CHR$(0);CHR$(0);
170 END

```

```

*** ESC % n 0 ***
--INTERNAL CHARACTER--

```

```

      DDDDDDDDDDDDD

```

```

--DOWNLOADED CHARACTER--

```

```

      ^^^^^^^^^^^^^

```

ESC #	Cancel MSB Control Mode
--------------	-------------------------

- Format** ESC #
- BASIC** CHR\$(27);"#";
- Hex** 1B 23
- Function** Clears the MSB control mode set by ESC > or ESC = .

Example

```

1  LPRINT "*** ESC # ***";CHR$(10);
10 LPRINT CHR$(27);">";
20 LPRINT "SET MSB CONTROL"
30 LPRINT
40 LPRINT CHR$(27);"#";
50 LPRINT "CANCEL MSB CONTROL";
60 END

```

```

*** ESC # ***
SET MSB CONTROL

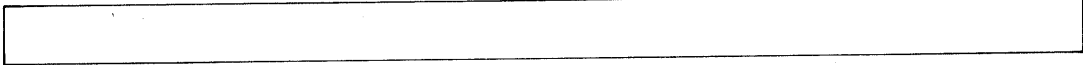
CANCEL MSB CONTROL

```

4.3 Control Sequences for Bit Image Print Mode

ESC K Standard Density Bit Image Mode

Format	ESC K $n_1 n_2$ $(1 \leq n_1 + 256 \times n_2 \leq 480)$
BASIC	CHR\$(27); "K"; CHR\$(n_1); CHR\$(n_2); CHR\$(d_1); CHR\$(d_2); ... CHR\$(d_n);
Hex	1B 4B $n_1 n_2 d_1 d_2 \dots d_n$
Function	<ul style="list-style-type: none">■ Mode I ■ Mode IIPrints in single-density bit image mode.* The printer switches to the standard density bit image mode, after printing all the data in the print buffer.* Print modes previously set are not cleared. The printer automatically turns to the text print mode at the end of the bit image print.* The two bytes n_1 and n_2 specify the number of bit image data bytes following the ESC K $n_1 n_2$ sequence; n_1 is the lower byte, and n_2 is the upper byte. Only the lower three bits of n_2 are used; the upper five are ignored. To print x columns of bit image data, n_1 is a remainder of x divided by 256 ($0 \leq n_1 \leq 255$); n_2 is the quotient. ($0 \leq n_2 \leq 7$)* In the bit image modes, the maximum width for a printed line is 480 columns. The printer prints only the first 480 bytes of any longer sequence. What happens to the excess cannot be predicted.* Characters and bit image data can be mixed on the same line, but this limit still applies. See Note 2 for the character widths to be used in the calculations.* Bit image data is printed only in the unidirectional print mode.



Example

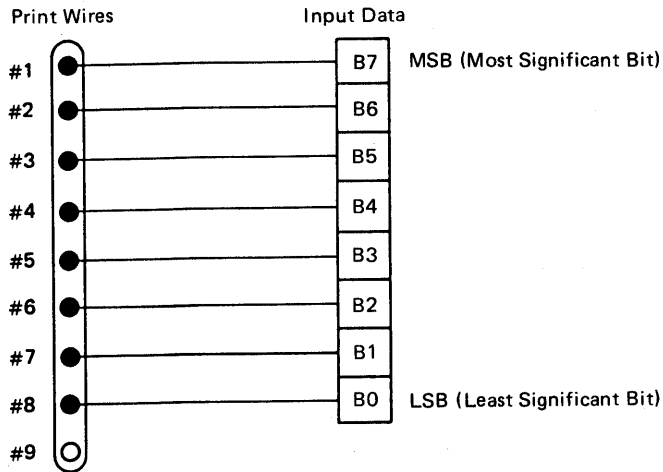
```
1 LPRINT "*** ESC K n1 n2 ***";CHR$(10);
10 FOR I=1 TO 5
20 LPRINT CHR$(27);"K";CHR$(160);CHR$(0);
30 FOR J=1 TO 8:FOR K=1 TO 20
40 N=2^J-1:LPRINT CHR$(N);
50 NEXT K:NEXT J:LPRINT CHR$(10);
60 NEXT I:END
```

*** ESC K n1 n2 ***



NOTES:

1. The bit image is printed with the following print wires.



- Wire #9 is not available for bit image printing.
- A dot is printed only if the corresponding bit of the input data is "1".

2. Character Widths

■ Mode I

	Normal	Enlarged
Pica-sized character	6 dots	12 dots
Emphasized character		
Condensed character	3.5 dots	7 dots
Elite-sized character	5 dots	10 dots

■ Mode II

	Normal	Enlarged
Pica-sized character	6 dots	12 dots
Emphasized character		
Condensed character	3.5 dots	7 dots

For example, if a line contains ten Pica-sized characters printed, the number of columns available for bit images is

$$480 - 10 \times 6 = 420 \text{ dots}$$

ESC L

Double Density Bit Image Mode

Format ESC L $n_1 n_2$ ($1 \leq n_1 + 256 \times n_2 \leq 960$)

BASIC CHR\$(27);"L";CHR\$(n_1);CHR\$(n_2);
CHR\$(d_1);CHR\$(d_2);... CHR\$(d_n);

Hex 1B 4C $n_1 n_2 d_1 d_2 \dots d_n$

Function ■ Mode I ■ Mode II

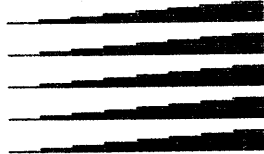
Prints in double-density bit image mode.

- * The printer switches to the double-density bit image mode, after printing all the data in the print buffer.
- * This sequence doubles the horizontal resolution to 960 columns per line for denser graphic data printing of bit image data. The results are similar to those with the ESC K command except that the maximum number of columns is 960 and that the character widths in Note 2 must be doubled.
- * In this mode, the print speed is reduced.

Example

```
1 LPRINT "*** ESC L n1 n2 ***";CHR$(10);
10 FOR I=1 TO 5
20 LPRINT CHR$(27);"L";CHR$(160);CHR$(0);
30 FOR J=1 TO 8
40 FOR K=1 TO 20
50 N=2^J-1
60 LPRINT CHR$(N);
70 NEXT K
80 NEXT J
90 LPRINT CHR$(10);
100 NEXT I
110 END
```

*** ESC L n1 n2 ***



ESC Z

Quadruple Density Bit Image Mode

Format ESC Z n_1 n_2 ($1 \leq n_1 + 256 \times n_2 \leq 1920$)

BASIC CHR\$(27);"Z";CHR\$(n_1);CHR\$(n_2);
CHR\$(d_1);CHR\$(d_2); ... CHR\$(d_n);

Hex 1B 5A n_1 n_2 d_1 d_2 ... d_n

Function ■ Mode I ■ Mode II

Prints in Quadruple-density bit image print mode.

- * The printer switches to the quadruple-density bit image mode, after printing all the data in the print buffer.
- * This sequence quadruples the horizontal resolution to 1920 columns per line for much denser graphic data printing of bit image data. The results are similar to those with the ESC K command except that the maximum number of columns is 1920 and that the character widths in Note 2 must be quadrupled.
- * In this mode, the print speed is reduced.

Example

```
1 LPRINT "*** ESC Z n1 n2 ***";  
CHR$(10);  
10 FOR I=1 TO 5  
20 LPRINT CHR$(27);"Z";  
CHR$(160);CHR$(0);  
30 FOR J=1 TO 8  
40 FOR K=1 TO 20  
50 N=2^J-1  
60 LPRINT CHR$(N);  
70 NEXT K  
80 NEXT J  
90 LPRINT CHR$(10);  
100 NEXT I  
110 END
```

*** ESC Z n1 n2 ***



4.4 Mixed Use of Print Modes in Character Printing

■ Mode I

The following table lists the print mode combinations available: Eight combination types (A-H) are available.

In the table, a circle "○" denotes a valid combination; an alphabet, a combination type which the printer will turn to, if the print mode is added in the current mode. For example, setting the Proportional print mode when the printer is in Combination type A turns the printer to Combination type E.

Print Modes		Combination Type							
		A	B	C	D	E	F	G	H
Supreme Print Mode	NLQ	H	H	H	H	H	H	H	○
Basic Print Modes	Elite-sized	F	G	F	G	F	○	○	
	Proportional	E	E	E	E	○			○
	Emphasized	C	D	○	○				
	Pica-sized	○	○						
Subsidiary Print Modes	Condensed	○	○				○	○	
	Super/Subscript	B	○	D	○		G	○	○
	Double-Strike	○		○		○	○		
	Enlarged	○	○	○	○	○	○	○	○
	Underlined	○	○	○	○	○	○	○	○

NOTES:

1. In the above table, the combination type to the right side has priority over the type to its left if the combination types are double selected, since there are priority orders between print modes shown Note 2.

(e.g.) If the Proportional mode is added when the printer is in Combination type D, the printer turns into Combination type E where the internal flag of the Super/Subscript mode is masked.

2. Mode Priority

Elite > Proportional > Emphasized > Pica
Underlined > Enlarged > Double-Strike > Script > Condensed

3. Basic print modes are not used together.
4. NLQ mode has priority over all other print modes. If the NLQ mode is set, the printer always turns to Combination type H.
5. If the print modes whose mixed use is not available are set together, the printer prints in that print mode having priority. However, the internal flag for the ignored print mode is set so that the printer will return to the lower priority mode when the priority mode is canceled.
6. The relation of the Superscript and Subscript mode is alternative. Setting either mode resets the other automatically.

* Selectable Print Modes Within a Single Line *

Mixed use of print modes indicated by a circle above are possible in the same line.



Example

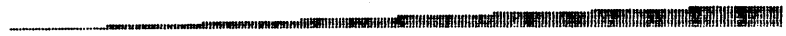
```

1  LPRINT "*** ESC * m n1 n2 ***"CHR$(10);
10 FOR M=0 TO 7
20 LPRINT "m=";M;CHR$(10);
30 '* SELECT BIT IMAGE MODE *
40 LPRINT CHR$(27);"*";CHR$(M);CHR$(240);
   CHR$(0);
50 FOR I=1 TO 8
60 N=2^I-1
70 FOR J=1 TO 30
80 LPRINT CHR$(N);
90 NEXT J:NEXT I:LPRINT CHR$(10);
100 NEXT M:END

```

*** ESC * m n1 n2 ***

m= 0



m= 1



m= 2



m= 3



m= 4



m= 5



m= 6



m= 7



5.1 Mode I Fx80+

(1) U.S.A.

Upper 4 Bits	Lower 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL		SPC	O	@	P	'	p	NUL		SPC	o	@	p	'	p	
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r	
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
3	0011			#	3	C	S	c	s			#	3	C	S	c	s	
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t	
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
5	0101			%	5	E	U	e	u			%	5	E	U	e	u	
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	0110			&	6	F	V	f	v			&	6	F	V	f	v	
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	0111			'	7	G	W	g	w			'	7	G	W	g	w	
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z	
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
B	1011	VT	ESC	+	;	K	[	k	[	VT	ESC	+	;	K	[	k	[
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
C	1100	FF		,	<	L	\	l	l	FF		,	<	L	\	l	l	
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
D	1101	CR		-	=	M	J	m	}	CR		-	=	M	J	m	}	
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
E	1110	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~	
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
F	1111	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL	
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	

Chapter 5.

CHARACTER

SET TABLES

CHARACTER



■ **Mode II**

The following table lists the print mode combinations available: Five combination types (A-E) are available.

In the table, a circle "○" denotes a valid combination; an alphabet, a combination type which the printer will turn to, if the print mode is added in the current mode. For example, setting the Emphasized print mode when the printer is in Combination type B turns the printer to Combination type D.

Print Modes		Combination Type				
		A	B	C	D	E
Supreme Print Mode	NLQ	E	E	E	E	○
Basic Print Modes	Emphasized	C	D	○	○	
	Pica-sized	○	○			
Subsidiary Print Modes	Condensed	○	○			
	Super/Subscript	B	○	D	○	○
	Double-Strike	○		○		
	Enlarged	○	○	○	○	○
	Underlined	○	○	○	○	○

NOTES:

1. In the above table, the combination type to the right side has priority over the type to its left if the combination types are double selected, since there are priority orders between print modes shown Note 2.
2. Mode Priority
 Emphasized > Pica
 Underlined > Enlarged > Double-Strike > Script > Condensed
3. Basic print modes are not used together.
4. NLQ mode has priority over all other print modes. If the NLQ mode is set, the printer always turns to Combination type E.
5. If the print modes whose mixed use is not available are set together, the printer prints in that print mode having priority. However, the internal flag for the ignored print mode is set to that the printer will return to the lower priority mode when the priority mode is canceled.
6. The relation of the Superscript and Subscript mode is alternative. Setting either mode resets the other automatically.

*** Selectable Print Modes Within a Single Line ***

Mixed use of print modes indicated by a circle above are possible in the same line.

(3) GERMANY

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
Lower 4 Bits	Hex No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL		SPC	0	§	P	‘	p	NUL		SPC	0	§	P	‘	p	
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r	
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
3	0011			#	3	C	S	c	s			#	3	C	S	c	s	
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t	
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
5	0101			%	5	E	U	e	u			%	5	E	U	e	u	
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	0110			&	6	F	V	f	v			&	6	F	V	f	v	
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	0111			'	7	G	W	g	w			'	7	G	W	g	w	
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z	
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
B	1011	VT	ESC	+	:	K	Ä	k	ä	VT	ESC	+	:	K	Ä	k	ä	
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
C	1100	FF		,	<	L	ö	l	ö	FF		,	<	L	ö	l	ö	
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
D	1101	CR		-	=	M	ü	m	ü	CR		-	=	M	ü	m	ü	
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
E	1110	SO		.	>	N	^	n	^	SO		.	>	N	^	n	^	
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
F	1111	SI		/	?	o	_	o	_	DEL	SI		/	?	o	_	o	DEL
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	

(2) FRANCE

Upper 4 Bits	Lower 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL		SPC	0	à	P	‘	p	NUL		SPC	0	à	P	‘	p	
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r	
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
3	0011			#	3	C	S	c	s			#	3	C	S	c	s	
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t	
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
5	0101			%	5	E	U	e	u			%	5	E	U	e	u	
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	0110			&	6	F	V	f	v			&	6	F	V	f	v	
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	0111			'	7	G	W	g	w			'	7	G	W	g	w	
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x	
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y	
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z	
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
B	1011	VT	ESC	+	;	K	°	k	é	VT	ESC	+	;	K	°	k	é	
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
C	1100	FF		<	L	£	l	ù		FF		<	L	£	l	ù		
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
D	1101	CR		=	M	§	m	è		CR		=	M	§	m	è		
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
E	1110	SO		.	>	N	^	n	¨	SO		.	>	N	^	n	¨	
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
F	1111	SI		/	? O	_	o	DEL	SI		/	? O	_	o	DEL			
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	

(5) DENMARK I

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F			
Lower 4 Bits	Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111		
0	0000	NUL		SPC	Ø	Æ	Ɔ	Ɔ	Ɔ	NUL		SPC	Ø	Æ	Ɔ	Ɔ	Ɔ			
			0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240		
1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q			
			1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241		
2	0010		DC2	"	2	B	R	b	r			DC2	"	2	B	R	b	r		
			2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242		
3	0011			#	3	C	S	c	s			#	3	C	S	c	s			
			3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243		
4	0100		DC4	\$	4	D	T	d	t			DC4	\$	4	D	T	d	t		
			4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244		
5	0101			%	5	E	U	e	u			%	5	E	U	e	u			
			5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245		
6	0110			&	6	F	V	f	v			&	6	F	V	f	v			
			6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246		
7	0111			'	7	G	W	g	w			'	7	G	W	g	w			
			7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247		
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x	
					8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
					9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z			
					10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	1011	VT	ESC	+	:	K	Æ	k	æ	VT	ESC	+	:	K	Æ	k	æ			
					11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	1100	FF		>	<	L	Ø	l	ø	FF		>	<	L	Ø	l	ø			
					12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	1101	CR		-	=	M	Å	m	å	CR		-	=	M	Å	m	å			
					13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	1110	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~			
					14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	1111	SI		/	?	Ø	_	ø	DEL	SI		/	?	Ø	_	ø	DEL			
					15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

(4) ENGLAND I

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 Bits	Hex No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL		SPC	0	@	P	'	p	NUL		SPC	0	@	P	'	p
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	0001		!	1	A	Q	a	q			/	1	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	0011			£	3	C	S	c	s			£	3	C	S	c	s
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	0101			%	5	E	U	e	u			%	5	E	U	e	u
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	0110			&	6	F	V	f	v			&	6	F	V	f	v
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	0111			'	7	G	W	g	w			'	7	G	W	g	w
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	1011	VT	ESC	+	;	K	L	k	l	VT	ESC	+	;	K	L	k	l
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	1100	FF		,	<	L	\	l	l	FF		,	<	L	\	l	l
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	1101	CR		-	=	M	J	m	j	CR		-	=	M	J	m	j
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	1110	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	1111	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

(7) ITALY

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 Bits	Hex No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL		SPC	0	@	P	ù	p	NUL		SPC	0	@	P	ù	p
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	0001		!	1	A	Q	a	q			/	1	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	0011			#	3	C	S	c	s			#	3	C	S	c	s
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	0101			%	5	E	U	e	u			%	5	E	U	e	u
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	0110			&	6	F	V	f	v			&	6	F	V	f	v
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	0111			'	7	G	W	g	w			'	7	G	W	g	w
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	1011	VT	ESC	+	;	K	°	k	à	VT	ESC	+	;	K	°	k	à
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	1100	FF		,	<	L	\	l	ò	FF		,	<	L	\	l	ò
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	1101	CR		-	=	M	é	m	è	CR		-	=	M	é	m	è
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	1110	SO		.	>	N	^	n	ì	SO		.	>	N	^	n	ì
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	1111	SI		/	?	o	_	o	DEL	SI		/	?	o	_	o	DEL
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

(6) SWEDEN

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
Lower 4 Bits	Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL		SPC	Ö	É	Þ	é	þ	NUL		SPC	Ö	É	Þ	é	þ	
			0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q	
			1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r	
			2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	0011			#	3	C	S	c	s			#	3	C	S	c	s	
			3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	0100		DC4	ø	4	D	T	d	t		DC4	ø	4	D	T	d	t	
			4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	0101			%	5	E	U	e	u			%	5	E	U	e	u	
			5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	0110			&	6	F	V	f	v			&	6	F	V	f	v	
			6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	0111			'	7	G	W	g	w			'	7	G	W	g	w	
			7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x	
			8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y	
			9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z	
			10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	1011	VT	ESC	+	:	K	Ä	k	ä	VT	ESC	+	:	K	Ä	k	ä	
			11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	1100	FF		>	<	L	ö	l	ö	FF		>	<	L	ö	l	ö	
			12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	1101	CR		-	=	M	Å	m	å	CR		-	=	M	Å	m	å	
			13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	1110	SO		.	>	N	Ü	n	ü	SO		.	>	N	Ü	n	ü	
			14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	1111	SI		/	?	Ö	-	ö	DEL	SI		/	?	Ö	-	ö	DEL	
			15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

ESC > Set MSB to 1

- Format** ESC >
- BASIC** CHR\$(27);">";
- Hex** 1B 3E
- Function** After this command is received, the most significant bit (MSB) of the following input data is forced to be set to 1.
 - * This MSB control is not effective to the Bit image data.
 - * This command is effective on ESC D, ESC B, ESC b, and ESC 3.

Example

```

1  LPRINT "*** ESC > & = ***";CHR$(10);
10 '* SET MSB TO 1 *
20 LPRINT CHR$(27);">";
30 GOSUB 80
40 '* SET MSB TO 0 *
50 LPRINT CHR$(27);"=";
60 GOSUB 80
70 END
80 LPRINT "Dot Matrix Printer"
90 LPRINT
100 RETURN

*** ESC > & = ***
Dot Matrix Printer

Dot Matrix Printer
  
```

ESC = Set MSB to 0

- Format** ESC =
- BASIC** CHR\$(27);"=";
- Hex** 1B 3D
- Function** After this command is received, the most significant bit (MSB) of the following input data is forced to be set to 0.
- Example** See ESC >.

ESC :	Copy Internal Character Set to Download Buffer
--------------	--

Format ESC : NUL NUL NUL

BASIC CHR\$(27);:;CHR\$(0);CHR\$(0);CHR\$(0);

Hex 1B 3A 00 00 00

Function Copies the internal character set into the download buffer.

Example

```

1  LPRINT "*** ESC : 0 0 0 ***";CHR$(10);
10 LPRINT "* DOWNLOAD SET *";CHR$(10);
20 LPRINT CHR$(27);"%";CHR$(1);CHR$(0);
30 GOSUB 110
40 LPRINT CHR$(27);"%";CHR$(0);CHR$(0);
50 LPRINT "* COPY INTERNAL CHARACTER SET ";
60 LPRINT "INTO DOWNLOAD *";CHR$(10);
70 LPRINT CHR$(27);"%";CHR$(1);CHR$(0);
80 LPRINT CHR$(27);": ";CHR$(0);CHR$(0);CHR$(0);
90 GOSUB 110
100 END
110 FOR I=32 TO 55
120 LPRINT CHR$(I);:NEXT
130 LPRINT CHR$(10);
140 RETURN

```

*** ESC : 0 0 0 ***

* DOWNLOAD SET *

* COPY INTERNAL CHARACTER SET INTO DOWNLOAD *

!"#\$%&'()*+,-./01234567

(9) JAPAN

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
Lower 4 Bits	Hex No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
	0	0000	NUL		SPC	0	@	P	'	p	NUL		SPC	0	@	P	'	p
			0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
	1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q
			1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
	2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
			2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
	3	0011			#	3	C	S	c	s			#	3	C	S	c	s
			3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
	4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t
			4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
	5	0101			%	5	E	U	e	u			%	5	E	U	e	u
			5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
	6	0110			&	6	F	V	f	v			&	6	F	V	f	v
			6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
	7	0111			'	7	G	W	g	w			'	7	G	W	g	w
			7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
	8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
			8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
	9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
			9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
	A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
			10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
	B	1011	VT	ESC	+	;	K	[	k	[	VT	ESC	+	;	K	[	k	[
			11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
	C	1100	FF		,	<	L	¥	l	l	FF		,	<	L	¥	l	l
			12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
	D	1101	CR		-	=	M	J	m	}	CR		-	=	M	J	m	}
			13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
	E	1110	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~
			14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
	F	1111	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL
			15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

(8) SPAIN

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
Lower 4 Bits	Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
	0	0000	NUL		SPC	0	é	P	‘	p	NUL		SPC	0	é	P	‘	p
	1	0001		!	1	A	Q	a	q			/	1	A	Q	a	q	
	2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
	3	0011		£	3	C	S	c	s			£	3	C	S	c	s	
	4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t
	5	0101		½	5	E	U	e	u			½	5	E	U	e	u	
	6	0110		&	6	F	V	f	v			&	6	F	V	f	v	
	7	0111		'	7	G	W	g	w			'	7	G	W	g	w	
	8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
	9	1001	HT	)	9	I	Y	i	y	HT	)	9	I	Y	i	y		
	A	1010	LF	*	:	J	Z	j	z	LF	*	:	J	Z	j	z		
	B	1011	VT	ESC	+	;	K	i	k	VT	ESC	+	;	K	i	k		
	C	1100	FF	>	<	L	Ñ	l	ñ	FF	>	<	L	Ñ	l	ñ		
	D	1101	CR	-	=	M	¿	m	}	CR	-	=	M	¿	m	}		
	E	1110	SO	.	>	N	ˆ	n	˜	SO	.	>	N	ˆ	n	˜		
	F	1111	SI	/	?	0	_	o	DEL	SI	/	?	0	_	o	DEL		

(11) DENMARK II

Upper 4 Bits	Lower 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL		SPC	O	É	F	é	p	NUL		SPC	O	É	P	é	p	
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
1	0001			!	1	A	Q	a	q			/	1	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r	
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
3	0011			#	3	C	S	c	s			#	3	C	S	c	s	
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t	
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
5	0101			%	5	E	U	e	u			%	5	E	U	e	u	
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	0110			&	6	F	V	f	v			&	6	F	V	f	v	
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	0111			'	7	G	W	g	w			'	7	G	W	g	w	
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x	
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y	
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z	
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
B	1011	VT	ESC	+	;	K	Æ	k	æ	VT	ESC	+	;	K	Æ	k	æ	
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
C	1100	FF		,	<	L	Ø	l	ø	FF		,	<	L	Ø	l	ø	
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
D	1101	CR		-	=	M	Å	m	å	CR		-	=	M	Å	m	å	
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
E	1110	SO		.	>	N	Ü	n	ü	SO		.	>	N	Ü	n	ü	
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
F	1111	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL	
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	

(10) NORWAY

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
Lower 4 Bits	Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL		SPC	Ø	É	P	é	p	NUL		SPC	Ø	É	P	é	p	
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
1	0001		!	1	A	Q	a	q			/	1	A	Q	a	q		
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r	
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
3	0011		#	3	C	S	c	s			#	3	C	S	c	s		
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
4	0100		DC4	ø	4	I	T	d	t		DC4	ø	4	I	T	d	t	
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
5	0101		%	5	E	U	e	u			%	5	E	U	e	u		
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	0110		&	6	F	V	f	v			&	6	F	V	f	v		
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	0111		'	7	G	W	g	w			'	7	G	W	g	w		
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	1000	BS	CAN	(	S	H	X	h	x	BS	CAN	(	S	H	X	h	x
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
9	1001	HT	)	9	I	Y	i	y	HT	)	9	I	Y	i	y		
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
A	1010	LF	*	:	J	Z	j	z	LF	*	:	J	Z	j	z			
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
B	1011	VT	ESC	+	:	K	Æ	k	æ	VT	ESC	+	:	K	Æ	k	æ	
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
C	1100	FF	,	<	L	Ø	l	ø	FF	,	<	L	Ø	l	ø			
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
D	1101	CR	-	=	M	Å	m	å	CR	-	=	M	Å	m	å			
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
E	1110	SO	.	>	N	Ü	n	ü	SO	.	>	N	Ü	n	ü			
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
F	1111	SI	/	?	Ø	_	o	DEL	SI	/	?	Ø	_	o	DEL			
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	

5.2 Mode II

IBM GRAPHIC PRINT

(1) Character Set 1

Upper 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 Bits	Hex No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL		SPC	0	@	P	'	p	NUL		á	⋮	L	⌋	α	≡
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	0001			!	1	A	Q	a	q			í	⋮	⌋	T	β	±
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	0010		DC2	"	2	B	R	b	r		DC2	ó	⋮	T	T	Γ	≥
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	0011			#	3	C	S	c	s			ú	|	†	L	π	≤
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	0100		DC4	\$	4	D	T	d	t		DC4	ñ	†	-	L	Σ	∫
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	0101			%	5	E	U	e	u			ñ	†	†	Γ	σ	J
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	0110			&	6	F	V	f	v			à	†	†	Γ	μ	÷
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	0111			'	7	G	W	g	w			ò	†	†	†	γ	≈
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	1000		CAN	(	8	H	X	h	x		CAN	¿	†	L	†	∅	°
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	1001	HT		)	9	I	Y	i	y	HT		ƒ	†	†	J	θ	·
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	1010	LF		*	:	J	Z	j	z	LF		ƒ	|	⌋	Γ	Ω	-
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	1011	VT	ESC	+	:	K	[	k	[	VT	ESC	¼	†	T	⋮	∅	√
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	1100	FF		·	<	L	\	l	l	FF		¼	J	†	⋮	∅	∩
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	1101	CR		-	=	M	J	m	>	CR		i	J	-	⋮	∅	2
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	1110	SO		·	>	N	^	n	~	SO		¼	J	†	⋮	∅	■
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	1111	SI		/	?	O	-	o		SI		¼	†	⌋	⋮	∩	SPC
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

(12) ENGLAND II

Upper 4 Bits	Hex No	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Lower 4 Bits	Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL		SPC	0	@	P	£	p	NUL		SPC	0	@	P	£	p
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
1	0001		!	1	A	Q	a	q			/	I	A	Q	a	q	
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
2	0010		DC2	"	2	B	R	b	r		DC2	"	2	B	R	b	r
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
3	0011			#	3	C	S	c	s			#	3	C	S	c	s
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
4	0100		DC4	\$	4	D	T	d	t		DC4	\$	4	D	T	d	t
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
5	0101			%	5	E	U	e	u			%	5	E	U	e	u
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
6	0110			&	6	F	V	f	v			&	6	F	V	f	v
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
7	0111			'	7	G	W	g	w			'	7	G	W	g	w
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN	(	8	H	X	h	x
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
9	1001	HT		)	9	I	Y	i	y	HT		)	9	I	Y	i	y
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
A	1010	LF		*	:	J	Z	j	z	LF		*	:	J	Z	j	z
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
B	1011	VT	ESC	+	:	K	[	k	[	VT	ESC	+	:	K	[	k	[
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
C	1100	FF		,	<	L	\	l	l	FF		,	<	L	\	l	l
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
D	1101	CR		-	=	M	J	m	}	CR		-	=	M	J	m	}
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
E	1110	SO		.	>	N	^	n	~	SO		.	>	N	^	n	~
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
F	1111	SI		/	?	O	_	o	DEL	SI		/	?	O	_	o	DEL
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

6.1 Proper Care of Printer

To keep your printer in good working condition, pay attention to the following points:

- Clean the printer with a soft brush at least every three months, to remove the paper particles and dust.
- If the exterior of the printer is smudged, use a cloth which has been dampened with a mild detergent and water solution. Never use alcohol, thinner or other organic solvents.
- Do not let clips or other metal objects drop in the printer as they could cause malfunctions.

6.2 Troubleshooting

If the printer should malfunction, check the following points.

Trouble	Probable Cause	Solution
Printer does not work at all.	<ul style="list-style-type: none">• Power is not supplied.	<ul style="list-style-type: none">• Plug the power cord into the outlet.
Printer does not print though power is ON, and data is transmitted.	<ul style="list-style-type: none">• Cable is not connected between input device and printer.• Printer is not ON LINE.	<ul style="list-style-type: none">• Connect the interface cable correctly.• Press ON LINE key.
Ribbon is not fed correctly.	<ul style="list-style-type: none">• Ribbon cassette is not placed correctly.	<ul style="list-style-type: none">• Place ribbon cassette correctly.

If the printer malfunctions even after the above countermeasures are taken, please contact your local dealer.

Chapter 6.

MAINTENANCE



(2) Character Set 2

Upper 4 Bits	Lower 4 Bits	Hex No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL		SPC	0	@	P	<	p	Ɔ	€	á	⋮	⌈	⌊	α	≡	
		0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	
1	0001		!	1	A	Q	a	q	ü	æ	í	⋮	⌈	⌊	β	±		
		1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241	
2	0010		DC2	"	2	B	R	b	r	é	Æ	ó	⋮	⌈	⌊	Γ	≥	
		2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242	
3	0011	♥		#	3	C	S	c	s	æ	ö	ú	⌈	⌊	⌈	⌊	Π	≤
		3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243	
4	0100	♦	DC4	\$	4	D	T	d	t	ä	ö	ñ	⌈	⌊	⌈	⌊	Σ	∫
		4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244	
5	0101	♣	§	%	5	E	U	e	u	à	ò	ñ	⌈	⌊	⌈	⌊	σ	∫
		5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245	
6	0110	♠		&	6	F	V	f	v	à	ù	æ	⌈	⌊	⌈	⌊	μ	≠
		6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246	
7	0111			'	7	G	W	g	w	Ɔ	ù	ø	⌈	⌊	⌈	⌊	τ	≈
		7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247	
8	1000		CAN	(	8	H	X	h	x	ø	y	ç	⌈	⌊	⌈	⌊	Ω	°
		8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	
9	1001	HT		)	9	I	Y	i	y	è	ö	ç	⌈	⌊	⌈	⌊	∅	"
		9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249	
A	1010	LF		*	:	J	Z	j	z	è	ü	ç	⌈	⌊	⌈	⌊	Ω	-
		10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250	
B	1011	VT	ESC	+	;	K	[	k	<	ï	¢	¼	⌈	⌊	⋮	⋮	§	∫
		11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251	
C	1100	FF		,	<	L	\	l	l	ï	£	¼	⌈	⌊	⋮	⋮	∞	∏
		12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252	
D	1101	CR		-	=	M	]	m	>	ï	¥	ï	⌈	⌊	⋮	⋮	∅	2
		13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253	
E	1110	SO		.	>	N	^	n	~	Ä	℞	⊗	⌈	⌊	⋮	⋮	∅	■
		14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254	
F	1111	SI		/	?	0	_	o		À	f	»	⌈	⌊	⋮	⋮	∏	SPC
		15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255	

A. Specifications

M1109

General Specifications

Print Method	Impact dot matrix		
Print Head	9 pins		
Print Speed	100 cps (Draft mode), 25 cps (NLQ mode)		
Print Head Life	50,000,000 characters min. (When rolling alphanumeric print)		
Printable Line Length	8 inches		
Copies	3 copies including an original		
Paper Feed Method	Friction Feed, Pin Feed (Opt.)		
Dot Pitch	Horizontal pitch	1/60"	
	Vertical pitch	1/72"	
Line Spacing	1/6"/time, 1/8"/time or programmed pitch 1/216" x X		
Paper Feed Pitch	220 ms/line (in 1/6" pitch)		
Printing Paper Width	Cut sheet	(A4 size)	210.8 mm (8.3")
		(Letter size)	216 mm (8.5")
	Fanfold paper (option)	101.6 to 254 mm (4 to 10")	
	Roll paper (option)	216 or 210.8 mm (8.5 or 8.3") (Max. dia. of roll: 70 mm)	
Ink Ribbon	Cassette type (fabric ribbon loop) Ribbon: width 8 mm, length 10 m, color: black Life Design Value: 500,000 characters (alphanumeric print)		
MTBF (Mean Time Between Failures)	4000 hours (excluding print head) Duty cycle for power-on time: 20% Duty cycle for print characters: 25%		
Environmental Conditions	Temperature: 5° ~ 35° C (in operation), -20° ~ 60° C (in storage) Humidity: 10 ~ 80%		
Power Supply	117, 220, or 240 VAC ± 10%, 50/60 Hz		
Power Consumption	30W		
Noise Level	60 dB max. (measured one meter away from the front of the printer horizontally, while it is printing ASCII characters, with A-scale SLOW.)		
Dimensions	334 (W) x 195 (D) x 70 (H) mm		
Weight	3.5 kg (7.8 lbs.)		
Interface	Centronics parallel & RS-232C serial dual interface		

APPENDICES

■ Mode II ... DIP SW2-2 : OFF

Print Direction	<ul style="list-style-type: none"> ● Bidirectional logic seeking printing: <ul style="list-style-type: none"> – Normal/Enlarged/Condensed/Emphasized characters – Superscript/Subscript characters (Unidirectional dual print for one line) ● Unidirectional printing: <ul style="list-style-type: none"> – Bit image/Graphic characters – NLQ mode (dual print) 								
Character Set	ASCII 96 characters 48 European characters 16 Greek characters 48 graphic characters 16 mathematical and extra symbols 5 symbols								
Character Size									
	Normal character ASCII		2.4 (H) x 2.0 (W) mm						
	Enlarged character		2.4 (H) x 4.0 (W) mm						
	Condensed character		2.4 (H) x 1.2 (W) mm						
	Condensed enlarged character		2.4 (H) x 2.4 (W) mm						
	Superscript character		1.2 (H) mm x VARIABLE (W)						
	Subscript character								
	Graphic character		2.8 (H) x 2.4 (W) mm						
	Special graphic character		4.2 (H) x 2.4 (W) mm						
Character Formation	Normal characters 9 x 9 dot matrix (half dot 4) Graphic characters..... 8 x 6 dot matrix Bit image <table style="display: inline-table; vertical-align: middle; border-left: 1px dashed black; border-right: 1px dashed black; border-collapse: collapse;"> <tr> <td style="padding: 0 5px;">---</td> <td style="padding: 0 5px;">8 x 480 (standard density)</td> </tr> <tr> <td style="padding: 0 5px;">---</td> <td style="padding: 0 5px;">8 x 960 (double density)</td> </tr> <tr> <td style="padding: 0 5px;">---</td> <td style="padding: 0 5px;">8 x 1920 (quadruple density)</td> </tr> </table>			---	8 x 480 (standard density)	---	8 x 960 (double density)	---	8 x 1920 (quadruple density)
---	8 x 480 (standard density)								
---	8 x 960 (double density)								
---	8 x 1920 (quadruple density)								
Dot Pitch	Horizontal pitch	1/60"							
	Vertical pitch	1/72"							
No. of Characters per Line (No. of Characters per Inch)	Pica	Normal	: 80 (10 cpi)						
		Enlarged	: 40 (5 cpi)						
		Emphasized	: 80 (10 cpi)						
	Condensed Pica	Normal	: 136 (17 cpi)						
		Enlarged	: 68 (8.5 cpi)						

Printing Specifications

■ Mode I ... DIP SW2-2 : ON

Print Direction	<ul style="list-style-type: none"> ● Bidirectional logic seeking printing: <ul style="list-style-type: none"> – Normal (Pica)/Enlarged/Condensed/Emphasized/Elite/Proportional print modes – Superscript/Subscript characters (Unidirectional dual print for one line) ● Unidirectional printing: <ul style="list-style-type: none"> – Bit image print mode (left to right) – NLQ mode (dual print) 			
Character Set	ASCII 96 characters 1 UK I character, 8 German characters 8 French characters, 6 Danish I characters 11 Swedish characters, 7 Italian characters 6 Spanish characters, 1 Japanese character 11 Norwegian characters, 10 Danish II characters 1 UK II character and same characters in italics			
Character Size	<i>ITALIC</i>	Normal	Enlarged	Superscript/Subscript
	Pica	2.4(H) x 2.0(W) mm	2.4(H) x 4.0(W) mm	1.2(H) x 2.0(W) mm
	Elite	2.4(H) x 1.7(W) mm	2.4(H) x 3.3(W) mm	1.2(H) x 1.7(W) mm
	Condensed	2.4(H) x 1.2(W) mm	2.4(H) x 2.4(W) mm	1.2(H) x 1.2(W) mm
Character Formation	Normal characters	9 x 9 dot matrix (half dot 4)		
		----- 8 x 480 (standard density)		
		8 x 576		
		8 x 640		
	Bit image	8 x 720		
		8 x 960 (double density)		
		8 x 1152		
		----- 8 x 1920 (quadruple density)		
Dot Pitch	Horizontal pitch	1/60" (Pica), 1/72" (Elite)		
	Vertical pitch	1/72"		
No. of Characters per Line (No. of Characters per Inch)	Pica	Normal	: 80 (10 cpi)	
		Enlarged	: 40 (5 cpi)	
		Emphasized	: 80 (10 cpi)	
	Elite	Normal	: 96 (12 pci)	
		Enlarged	: 48 (6 cpi)	
	Condensed Pica	Normal	: 136 (17 cpi)	
		Enlarged	: 68 (8.5 cpi)	

(3) Signal Description

Pin No.	Signal Name	IN/OUT	Explanation
1	$\overline{\text{DATA STROBE}}$	IN	Data reading strobe pulse whose minimum width shall be 1 μs . High in steady state. Data is read on the leading edge of this signal going Low.
2-9	DATA 1-8	IN	Bit 1 through bit 8 of the data. The level is High for 1 and Low for 0.
10	$\overline{\text{ACKNLG}}$	OUT	High in steady state. It goes Low when the printer has received data and is ready to receive the next data. The pulse width is 6 μs .
11	BUSY	OUT	Signal to indicate if the printer is data receivable. Data input is possible when this signal is Low. This signal goes High under any of the following conditions: <ul style="list-style-type: none"> - During printer operation - During data input - In offline (DESELECT) state
12	PE	OUT	DC level signal that goes High when the paper empty state is detected.
13	+5V	OUT	Pulled up to +5V by 4.7 k Ω resistor.
14	$\overline{\text{AUTO FEED XT}}$	IN	If the printer receives a CR code with this signal Low, it automatically feeds paper by one line after printing.
16	S. GND	-	Signal ground 0V. Connected in the printer.
17	F. GND	-	Frame ground 0V. Connected in the printer.
18	+5V Source	OUT	Output max. 30 mA, +5V.
19-30	TWISTED PAIR GND	-	Return ground of signal cable.
31	$\overline{\text{INIT}}$	IN	When this signal goes Low, the printer is reset to the initial state and the print buffer is cleared.
32	$\overline{\text{FAULT}}$	OUT	This DC level signal goes Low when there is an abnormality in the printer or when the printer is in the offline state.
33	GND	-	Same as 19-30.
35	+5V	OUT	Pulled up to +5V by 4.7 k Ω resistor.
36	$\overline{\text{SLCT IN}}$	IN	Turning this signal Low takes the printer online; High, offline, if no error is detected in the printer.
15, 34	NC	-	Not used.

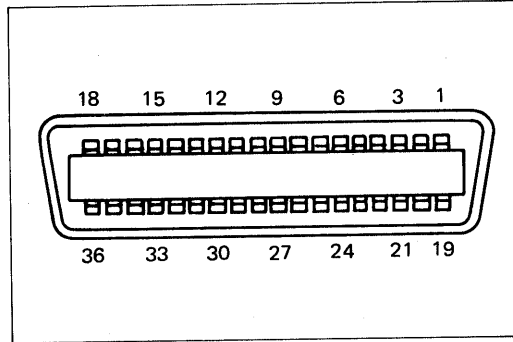
B. Interface

1. Parallel Interface (Centronics)

(1) Interface Connectors

Printer Side : Amphenol 57LE-40360 or equivalent
 Cable Side : Amphenol 57FE-30360 or equivalent

Shield cable (twisted pair cable) shall be used.
 Cable Length: 1.9 m (6 feet) max.



(2) Pin Assignment

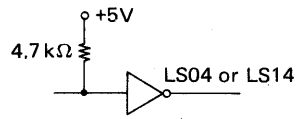
Pin No.	Signal name	Pin No.	Signal name
1	DATA STROBE	19	TWISTED PAIR SIGNAL GND
2	DATA 1	20	
3	DATA 2	21	
4	DATA 3	22	
5	DATA 4	23	
6	DATA 5	24	
7	DATA 6	25	
8	DATA 7	26	
9	DATA 8	27	
10	ACKNLG	28	
11	BUSY	29	
12	PE	30	
13	+5V (4.7 kΩ pull-up)	31	INIT
14	AUTO FEED XT	32	FAULT
15	NC	33	GND
16	0V (Signal GND)	34	NC
17	F.G.	35	+5V (4.7 kΩ pull-up)
18	+5V	36	SLCT IN

(5) SLCT, BUSY and FAULT Set/Reset Conditions

Status	Set conditions	Reset conditions
ON LINE lamp	<ol style="list-style-type: none">1. ON LINE key ON2. Power ON	<ol style="list-style-type: none">1. PE (Paper Empty)2. Motor abnormal operation3. ON LINE key OFF
BUSY signal	<ol style="list-style-type: none">1. Offline state2. PE3. BUFFER FULL4. Printing5. Carriage moving6. Paper feeding7. Data entering	<ol style="list-style-type: none">1. Online state2. PE reset
FAULT signal	<ol style="list-style-type: none">1. PE2. SLCT OFF	<ol style="list-style-type: none">1. SLCT ON2. PE reset3. POWER ON. OFF

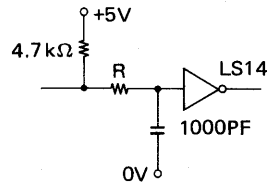
(4) Input (output circuit)

- DATA 1 to 8



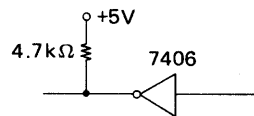
(Receiver circuit)

- $\overline{\text{DATA STROBE}}$ ($R = 47\Omega$)
 $\overline{\text{INIT}}$ ($R = 100\Omega$)



(Receiver circuit)

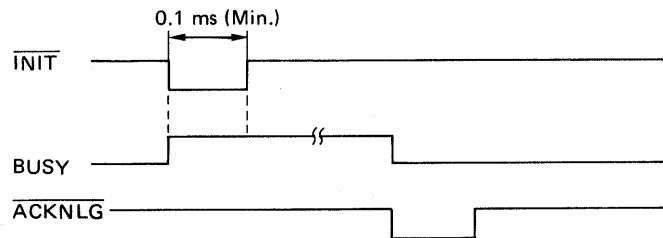
- $\overline{\text{ACK}}$, $\overline{\text{BUSY}}$, $\overline{\text{PE}}$, $\overline{\text{FAULT}}$



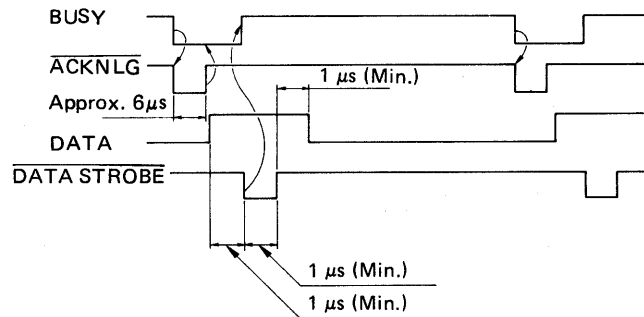
(Driver circuit)

(5) Timing Chart

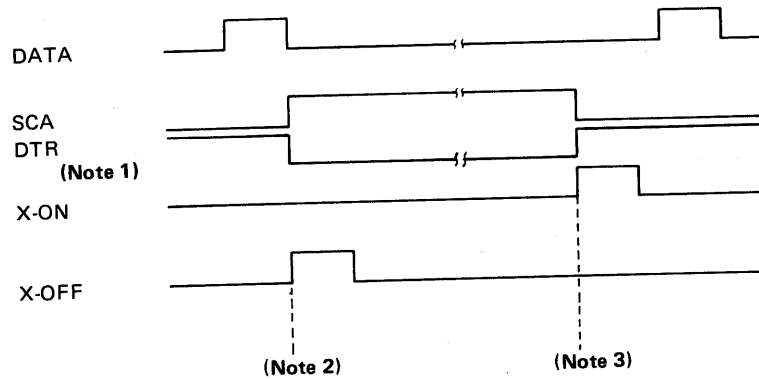
- Initiation



- Data Receiving



(3) Timing Chart



NOTES:

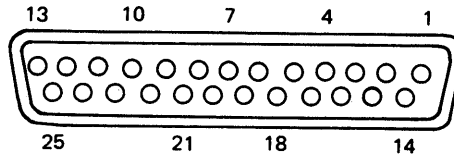
1. Control signals SCA and DTR on serial interface line are in the opposite polarity each other; that is, SCA is High and DTR is Low, if the printer is in Busy condition.
2. Transmission timing of X-ON/OFF is basically synchronized with those of SCA and DTR. However, if the printer receives data in DESELECT state, X-OFF is immediately transmitted so that the printer can receive up to 16 bytes of data. After receipt of the 16 bytes of data, X-OFF is transmitted again and the subsequence received data is ignored.
3. X-ON transmission timing is controlled by DIP SW2-7. If DIP SW2-7 is set to ON, X-ON is transmitted when the data buffer counts for 153 bytes or less by data transfer to the print buffer; if OFF, X-ON is transmitted when it counts for 1936 bytes or less.

2. Serial Interface (RS-232C)

(1) Interface Connectors

Printer Side : Amphenol Printer side : 17LE-10250 or equivalent
 Cable Side : Amphenol Cable side : 17DB25P or equivalent

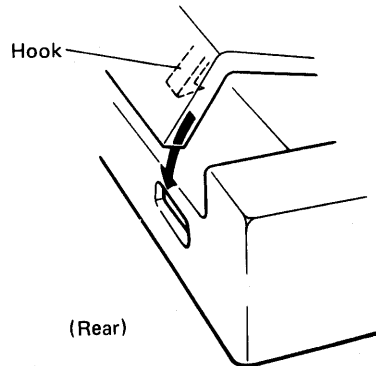
Shielded cable shall be used.
 Cable Length: 2 m (6.5 feet) max.



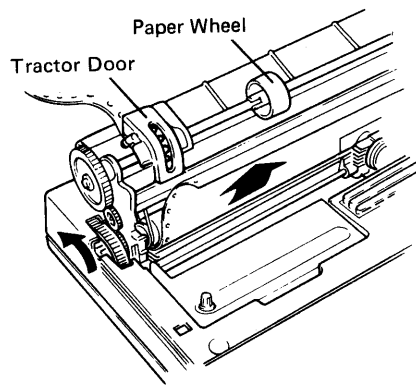
(2) Pin Assignment and Signal Description

Pin No.	Signal name	Description
1	FG	Frame Ground
2	SD	Send Data. Available when X-ON/OFF transmission mode is selected by setting DIP SW1-3 ON. This signal sends X-OFF (13H) when the printer goes Busy; X-ON (11H) when not Busy.
3	RD	Receive Data. Receives data transmitted from the computer.
4	RTS	Request to Send. Always HIGH (+8V).
5	CTS	Clear to Send. Not used.
6	DSR	Data Set Ready. When DSR is HIGH (+8V) or Open, data is accepted.
7	0V	Signal Ground on the interface.
8	CD	Carrier Detect. Not used.
11	SCA	Secondary Request to Send. HIGH (+8V) when the printer is Busy.
20	DTR (ER)	Data Terminal Ready. LOW (-8V) when the printer is Busy.

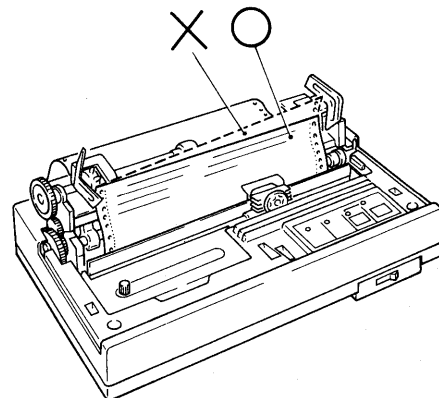
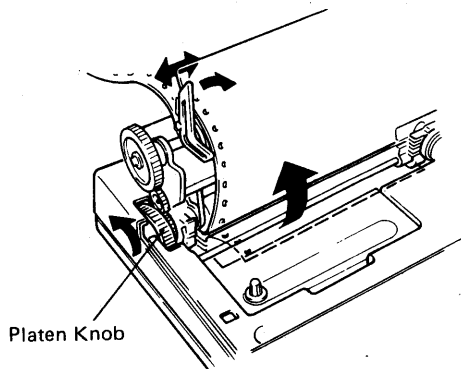
- (5) Push the rear of the Pin Feed Unit down until the rear hooks latch into the rear holes.



- (6) Insert the paper into the paper entrance, and feed the paper in the same way as cut forms.
(7) Push the paper release lever toward OPEN and adjust the paper.
(8) Adjust the sprocket pin position to the paper width, and slide the paper wheel to the center of the paper.



- (9) Open the tractor doors, engage the sprocket holes of the paper on the pins, and close the doors.
– Make sure that the paper is not skewed and that the paper release lever is set to OPEN.
– After loading paper, take the printer offline and press the LF key with the power switch ON to advance the paper by one line. This operation ensures the specified spacing between the first and second lines.

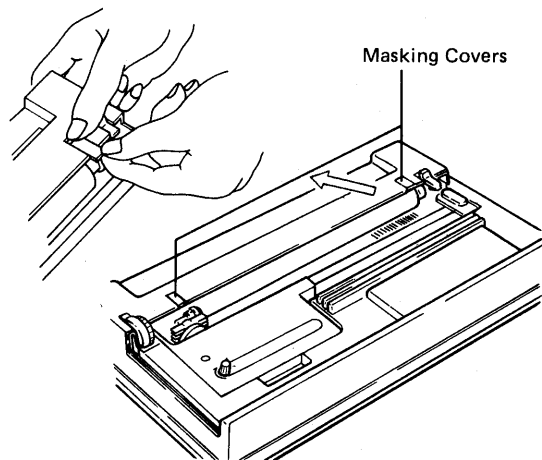


C. Options

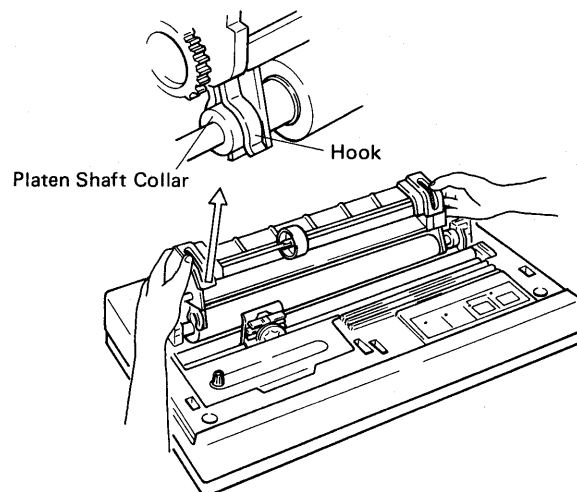
1. Loading Fanfold Paper (Optional Pin Feed Unit)

Installing the optional Pin Feed Unit allows you to use continuous fanfold forms in this printer.

- (1) Pivot the acoustic cover up and forward, and then raise it to remove. (if installed)
 - Store the cover for possible future use.
- (2) Remove the top cover.
- (3) Pressing down the two small masking covers, pull them toward you and remove them from the body cover.
 - Store the covers for possible future use.



- (4) Insert the hooks of the Pin Feed Unit through the openings; and snap them onto the platen shaft collars.

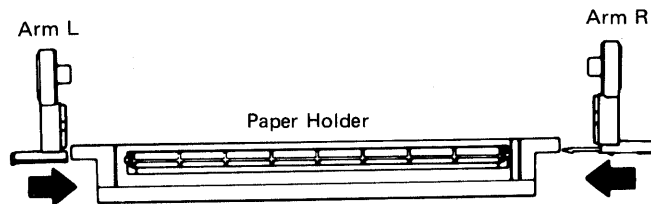


2. Loading Roll Paper (Optional Roll Paper Holder)

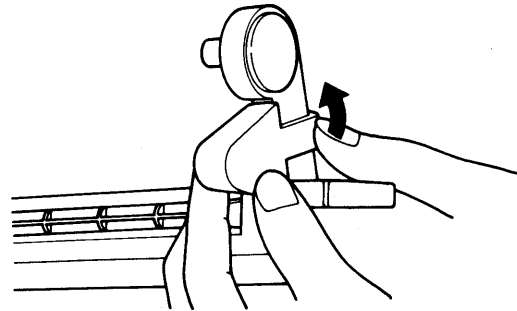
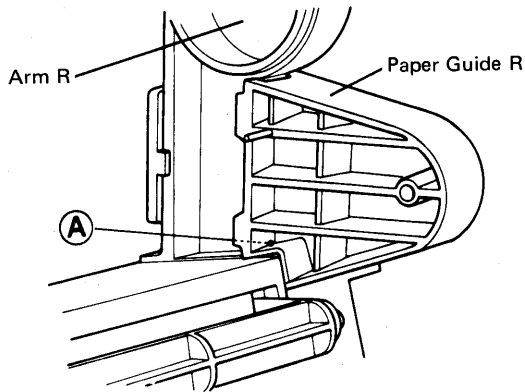
Installing this optional unit allows you to use roll paper in this printer.

(1) Assemble the Roll Paper Holder.

- Push the arm L along the guide until it clicks securely into place.
- Insert the arm R in the guide groove and slide it into position.

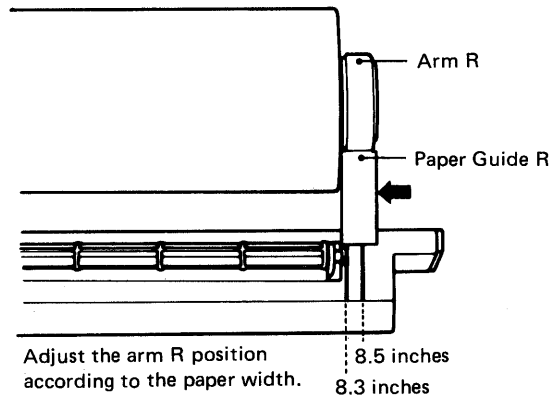
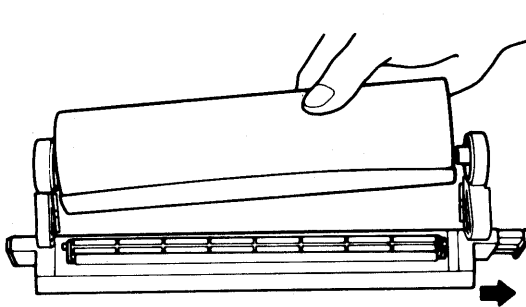


- Aligning the paper guide R with joint (A) of the arm R, push the paper guide R securely into place in the direction of the arrow as illustrated.
- Attach the paper guide L in the same way as the guide R.

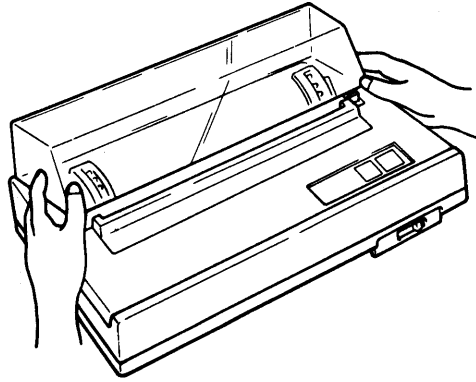


(2) Slide the arm R out and load the roll paper.

- Adjust the arm R position to suit the paper width.
- Use roll paper with an outside diameter of 70 mm or less, and a core inside diameter of 12 mm or more.

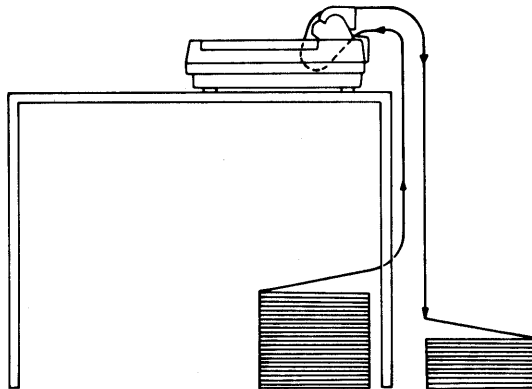


- (10) Turn the platen knob backward to feed the paper back to the print start position.
- (11) Reposition the top cover.



- (12) Install the Pin Feed Unit cover.

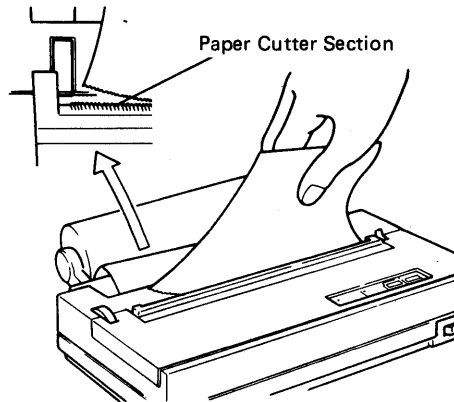
NOTE: When the printer is to be used on a desk or a bench, arrange the fanfold paper as illustrated so that the paper will be folded in the proper accordion style.



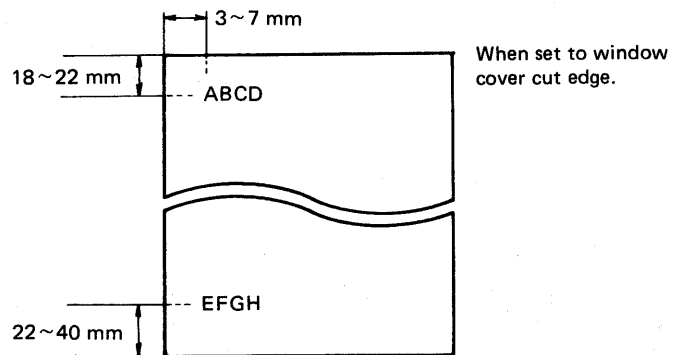
■ Paper Tear Function

When roll paper is used, the printed paper can be torn away from the roll using the paper cutter section provided on the window cover.

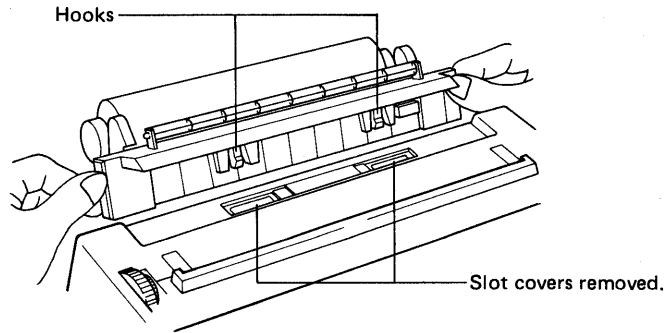
Starting at the right or left edge, pull paper slowly up and toward you.



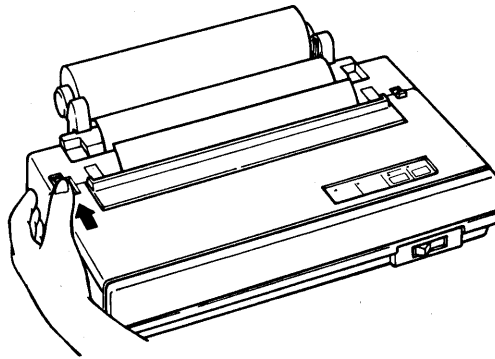
When the left edge of the paper has been adjusted to the scale, the printed characters will be positioned as shown, relative to the torn edges.



- (3) Pivot the acoustic cover up and forward, and then raise it to remove.
– Store the cover for possible future use.
- (4) Remove the slot covers from the printer body cover.
- (5) Engage the roll paper holder hooks securely with each slot on the printer body.



- (6) Feed the paper into the printer by applying the same procedures described in Section 2.6 Loading Cut Forms.



- (7) Insert one end of the separator into the hole located at the upper inside of the paper guide, and then the other end into the hole of the opposite paper guide.

