User's Manual

CITIZEN®

TERMINAL SLIP PRINTER
MODEL CBM-810

Japan CBM Corporation

IMPORTANT SAFETY INSTRUCTIONS

- Read all of these instructions and save them for later reference.
- Follow all warnings and instructions marked on the printer.
- Unplug this printer from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use this printer near the water.
- Do not place this printer on an unstable cart or table. If the printer falls it can cause serious damage to the product.
- Slots and openings on the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. The openings should never be blocked by placing the product on a bed, sofa, rug of other similar surface.
  This printer should never be placed near or over a radiator or heat register.
  This printer should not be placed in a built-in installation unless proper ventilation is provided.
- This printer should be operated by the specified power voltage indicated on the marking label. If you are not sure of the voltage level available, consult your dealer or local electric company.
- Do not allow anything to rest on the power cord. Do not locate this printer where the cord will be walked on.
- If a extension cord is used with this printer, make sure the total ampere rating on the printer, plugged into a extension cord, dose not exceed the extension cord ampere rating.
- Never push foreign object of any kind through the cabinet slots of the printer.
- Except as explained elsewhere in this manual, don't attempt to service this product yourself. Opening and removing those covers that are marked "do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing on those compartments to service personnel.
- Unplug this printer from the wall outlet and refer servicing to qualified service personnel under the following conditions.
  A.   When the power cord or plug is damaged or frayed.
  B.   If liquid has been spilled into the printer.
  C.   If the printer has been expose to rain or water.
  D.   If the printer does not operate properly when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Adjustments of other controls may result in damage and often require extensive work by a qualified technician to restore the printer to its proper operation.
  E.   If the printer has been dropped or the cabinet has been damaged.
  F.   If the printer shows a distinct charge in performance.

CONTENTS

1. INTRODUCTION

CBM-810 is a terminal slip printer which has dot impact printing method. Since this printer is designed compactly, it can be easily installed at any places.

Before using this printer, please read this manual carefully. You will have an adequate understanding of its operation.

1.1 Features

1. Mini slip printer
2. TOF BOF detection function
3. Paper feed amount control function
4. Paper feed direction control (for and reverse) function
5. Printing from top to bottom function
6. Input buffer (4k bytes) built-in
7. Paper discharging function
8. Enlarged character
9. Spot light at hand

1.2 Accessories

Check if the following accessories are included inside the box.

Ribbon cassette	1 pc.
AC adaptor	1 pc.
AC power supply code	1 pc.
Paper guide	1 pc.
User's manual	1 pc.

Note: There is a rubber plate in the pointed position. This is necessary for the transportation. Please remove it before using.
(Please put back the rubber plate in when the printer has been transported.)

Rubber plate
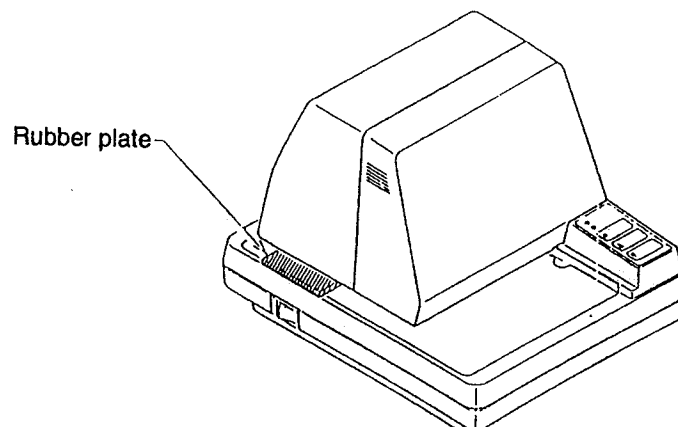
2. SPECIFICATIONS

2.1 Type classifications

```
C B M - 8 1 0 - R J 1 2 0 - 7
```

Model name

Print head
  7 : 7 pin
  9 : 9 pin

AC power supply code
  120 : AC120V
  230 : AC230V

Character
  J : Japanese
  F : International

Interface
  R : Serial RS-232C
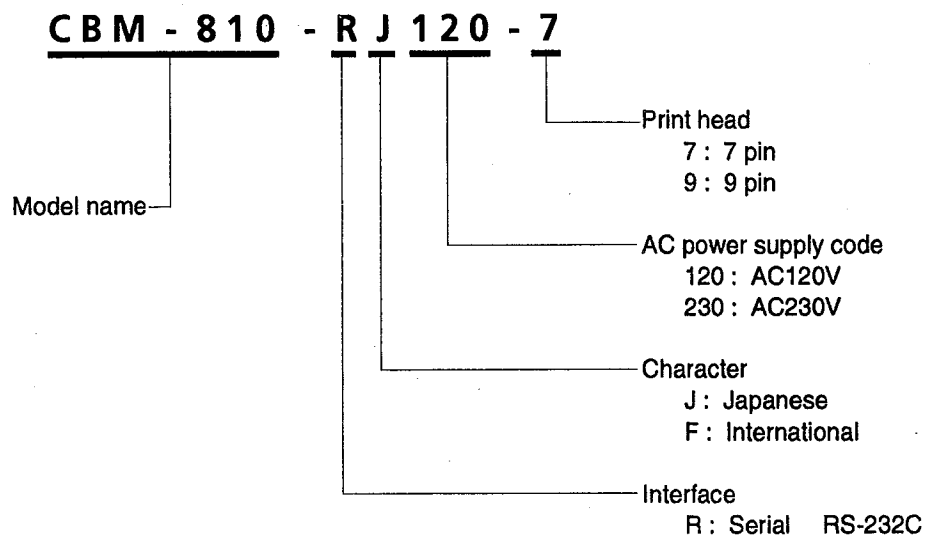
2.2 AC adaptor and AC power supply code

1) AC adaptor

Model:	AD810 (SA25-3109-24V)
Input:	AC90V-264V 50Hz/60Hz
Output:	DC24V 1A
Electrode:	(−)———(•)———(+)

2) AC adaptor external dimensions (in mm)
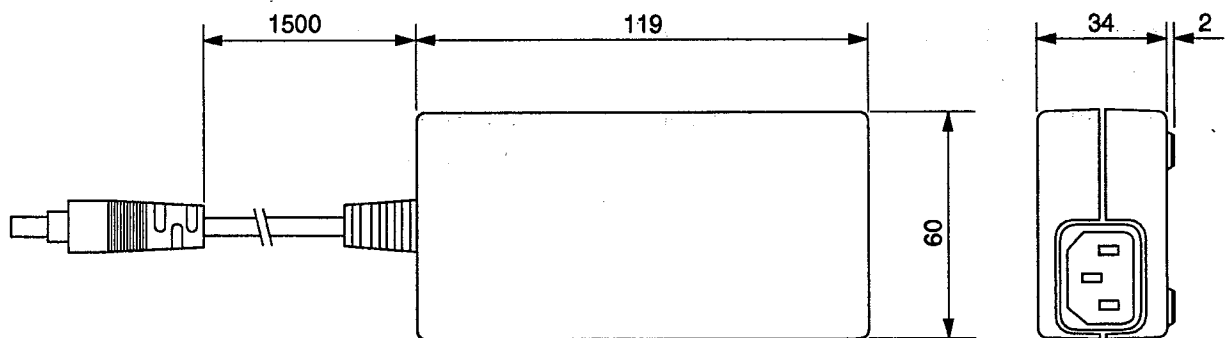
3) AC power supply code

Area	Part number	Voltage
USA	PW810-1	AC120V
EUR	PW810-2	AC230V

—2—

2.3 Specifications

Item	Contents
Printing Method	Serial dot matrix
Printing direction	One-way printing
Character configuration	5 × 7, 5 × 9 or 7 × 7, 7 × 9 (incl. half dot)
Number of column	33 col. (5 × 7, 5 × 9 font) 40 col. (7 × 7, 7 × 9 font)
Printing speed	Approx. 2.3 line/sec.
Character size	2.7 × 1.7 mm (5 × 7 font), 3.12 × 1.7 mm (5 × 9 font) 2.7 × 1.3 mm (7 × 7 font), 3.12 × 1.3 mm (7 × 9 font)
Line spacing	4.23 mm (1/6 inch) Adjustable location diagram
Time of starting a new line	Line feed: 38ms/line min. (26.3 line/sec. max.) Continuous line feed: 24ms/line min. (41.7 line/sec. max.)
Paper	Regular paper 80(W) × 90(L)mm – 182(W) × 257(L)mm Total paper thickness: 0.09 – 0.3 mm 3 copies max. (1 original + 2 copies): (0.07 – 0.09 mm)
Ink ribbon	Purple Life: 5 mil. characters
Interface	Serial (RS-232C), Parallel (Centronics)
Input buffer	4k bytes
Paper end detection	TOF, BOF detection (Command input is necessary)
Power supply	DC24V 1A
Net weight	Approx. 2.8 kg
External dimensions	Ref : External dimension diagram (page 29)
Operation temperature	0 ~ 40°C
Storage temperature	–20 ~ 60°C
Reliability	Printer : 4 mil. lines (excl. print head) Print head : 70 mil. characters

2.4 Diagram of printing location

*1 Firm stopper can be adjusted upto 16 mm.

*2 When you operate paper feed in reversed direction after printing, it can be printed at the place of 30.5 mm from the end of paper.

    note: If you operate paper feed in forward direction farther to the above place, paper end can be dislocated from BOF sensor and the paper can be caught when it is fed in reversed direction.

*3 After printing, if you do not operate paper feed in reversed direction, the paper can be printed at the place where the paper end is out of paper feed roller (12 mm).

FORM STOPPER
NORMAL SETTING PLACE

*1

TOF sensor

16   18   25.65

Paper feed in normal direction

Initial printing place

4.23   2.7   68.5   15.8

Last printing place

*3   *2

12   28.65   30.5

(Unit: mm)   Paper feed roller   BOF sensor
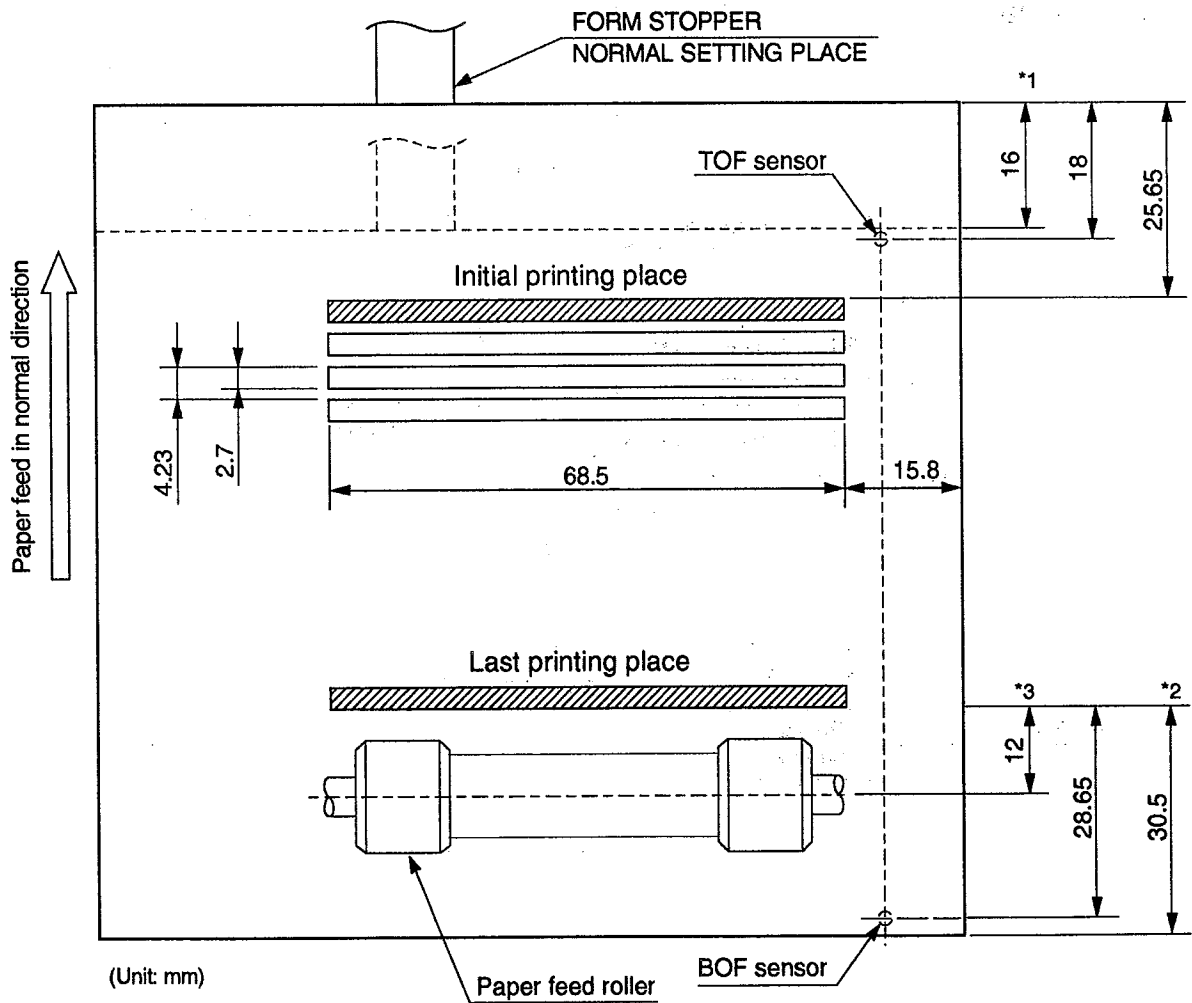
2.5 Block diagram
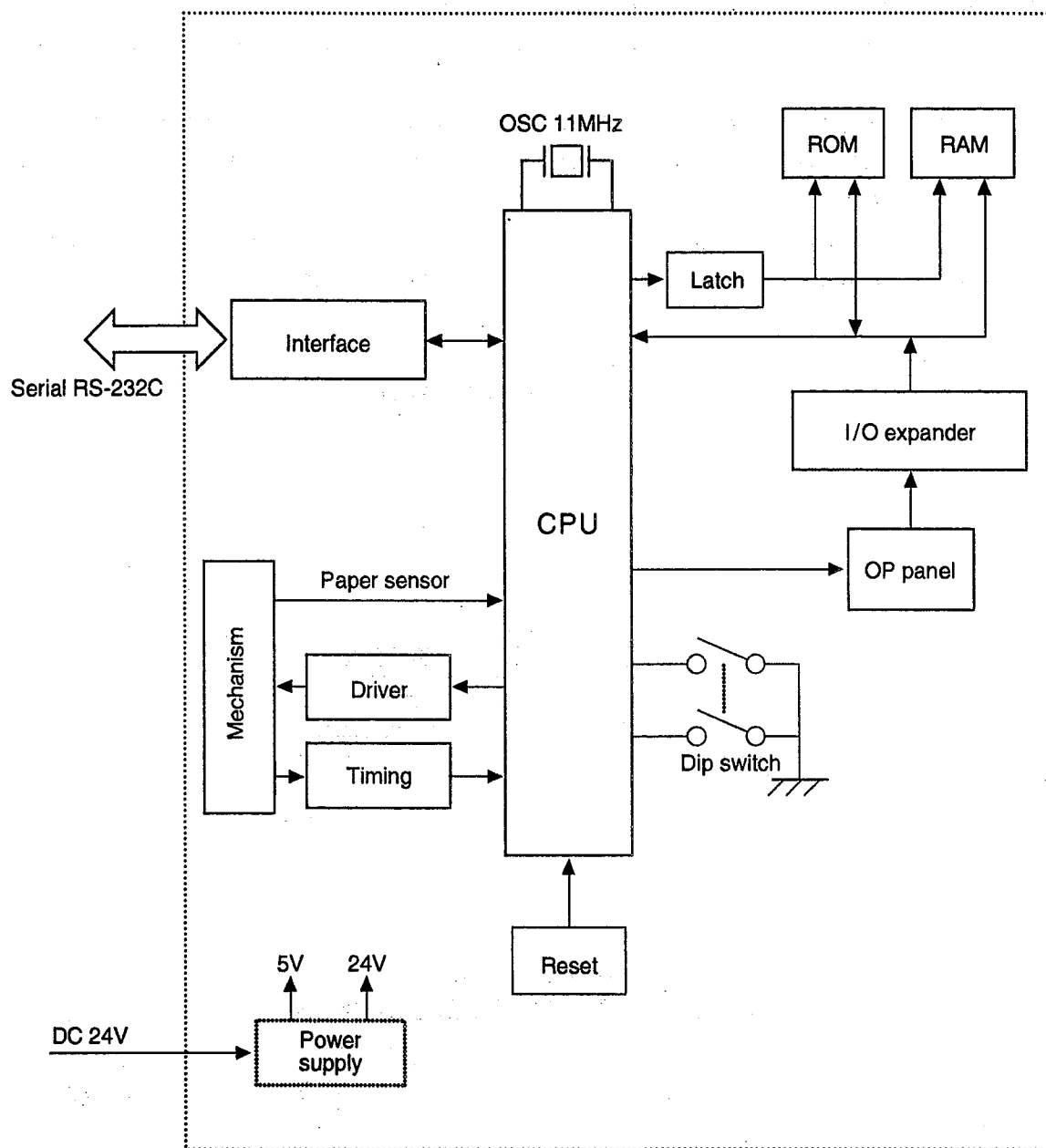
3. EXTERNAL APPEARANCE AND PARTS NAME

3.1 External appearance and parts name

(14) Upper cover

(13) Ribbon cover

(16) Paper guide

(3) Power lamp

(4) PAPER OUT lamp

(5) RELEASE lamp

(6) RELEASE switch

(7) FORWARD switch

(8) REVERSE switch

(17) Lamp

(12) Paper table

(2) Power switch

(15) Lower cover

(9) Interface connector

(1) DC jack

(10) DIP switch

(11) Earth terminal
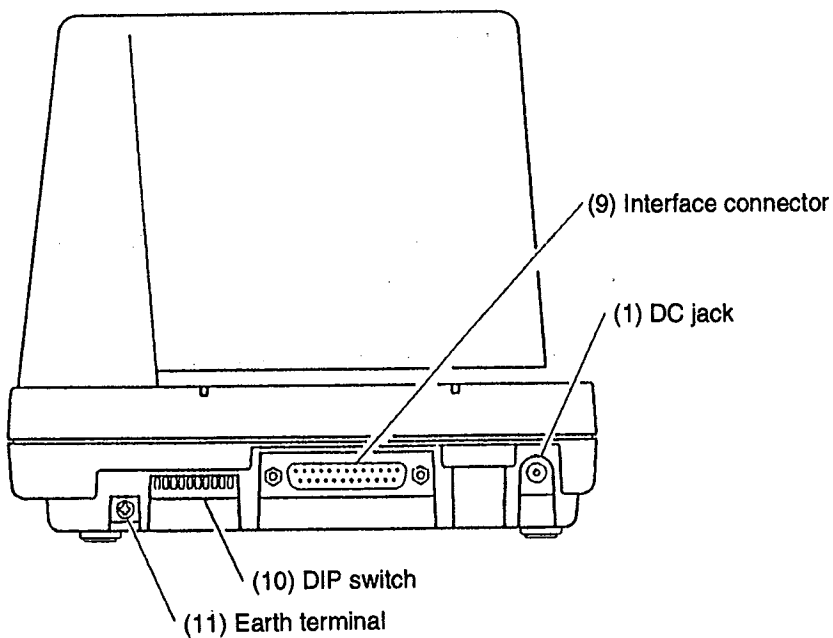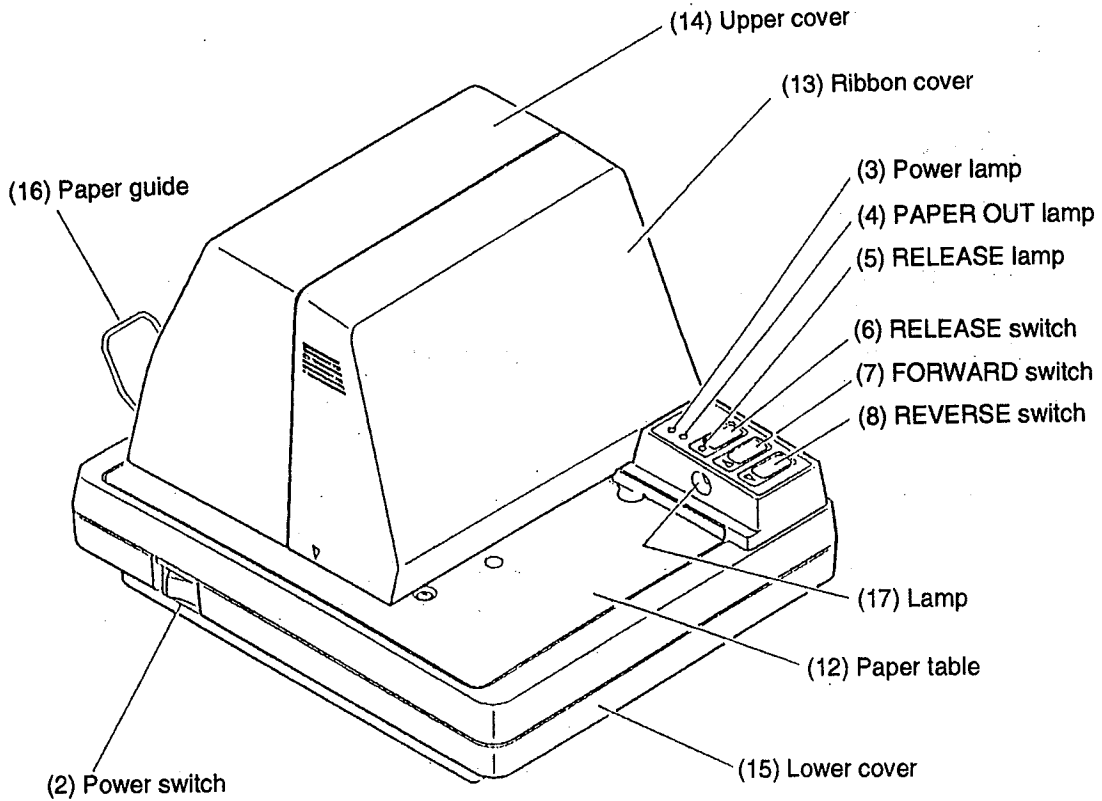
3.2 Explanation on various parts

1)	DC jack	Please insert output plug of enclosed AC adaptor.
2)	Power switch	When you turn on the power switch, power is supplied to the printer and initializing operation starts.
3)	POWER lamp	Lits on/off by the power switch.
4)	PAPER OUT lamp	Lits when the paper is not set.
5)	RELEASE lamp	Lits when it is released. Also blinks when paper error happens.
6)	RELEASE switch	When pushed, paper is released.
7)	FORWARD switch	When pushed, paper is fed in the forward direction.
8)	REVERSE switch	When pushed, paper is fed in the reversed direction.
9)	Interface connector	They are connected to various kinds of hosts via cables. When you connect please make sure the power, of the host and the printer are off.
10)	Dipswitch	They are for function selection use. When you change the selection, please do it after turning the power off.
11)	Ground terminal	
12)	Paper table	Please set the slip on this table. Please be careful not to set them uneven.
13)	Ribbon cover	You'll open this when you change a ribbon cassette.
14)	Upper cover	
15)	Lower cover	
16)	Paper guide	When the printer is set closed to a wall, this guide will protect a paper not to be blocked.
17)	Lamp	This is to light up around the lamp area.

4. OPERATION

4.1 Connection AC adaptor

1. Make sure the power switch is off.
2. Put the output plug of AC adaptor in DC jack of the printer.
3. Put the plug of AC power supply code in the outlet.

   For power supply, please use the original AC adaptor.
   To prevent DC jack being short, please put DC code through the wire saddle as the picture.

Wire saddle

DC code
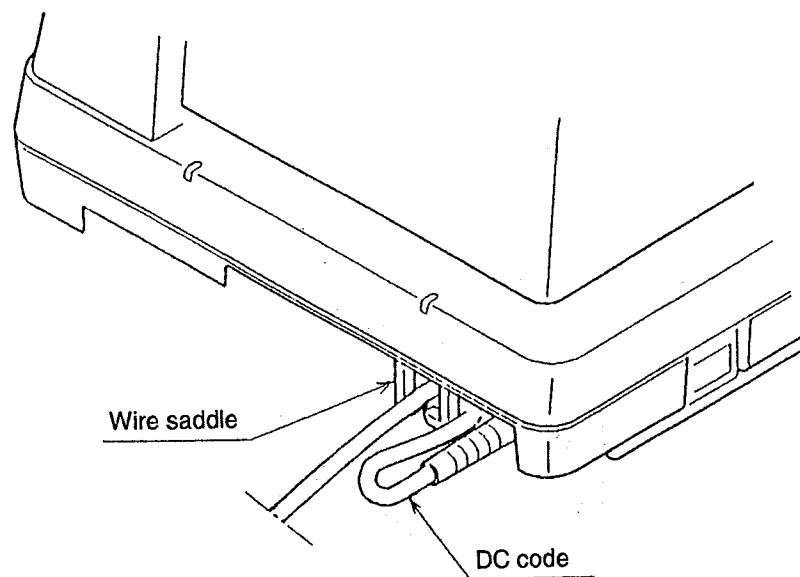
4.2 Attaching/Removing the ribbon cover

1. Place your hand on the left and right side of the ribbon cover and lift it up.
2. When putting the ribbon cover back on, be cautious on the 3 arrow and press the cover down.

Ribbon cover

Hand holder

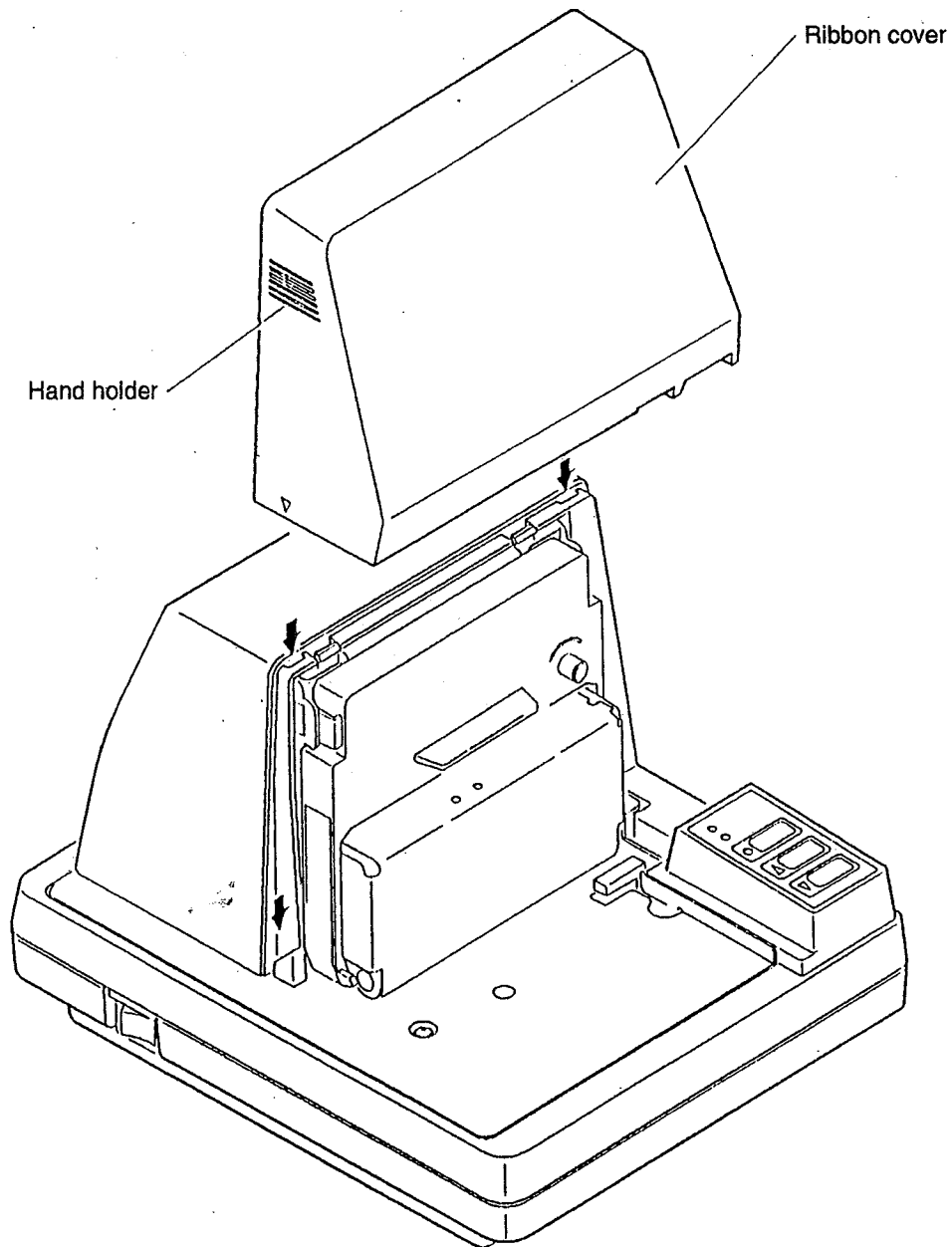## 4.3 Setting the ribbon cassette

1. Installation
   (1) Turn the knob of the side of ribbon cassette fin toward the direction of the arrow and wind up the ribbon slack.
   (2) As pressing the manual lever down, put the ribbon through under the head cover.
   (3) Push the ribbon cassette in by matching the nails.

2. Removing
   (1) As pressing the manual lever down, hold the ribbon cassette fin and pull it toward foreground.

Ribbon cassette   Fin

Head cover

Knob

Manual lever
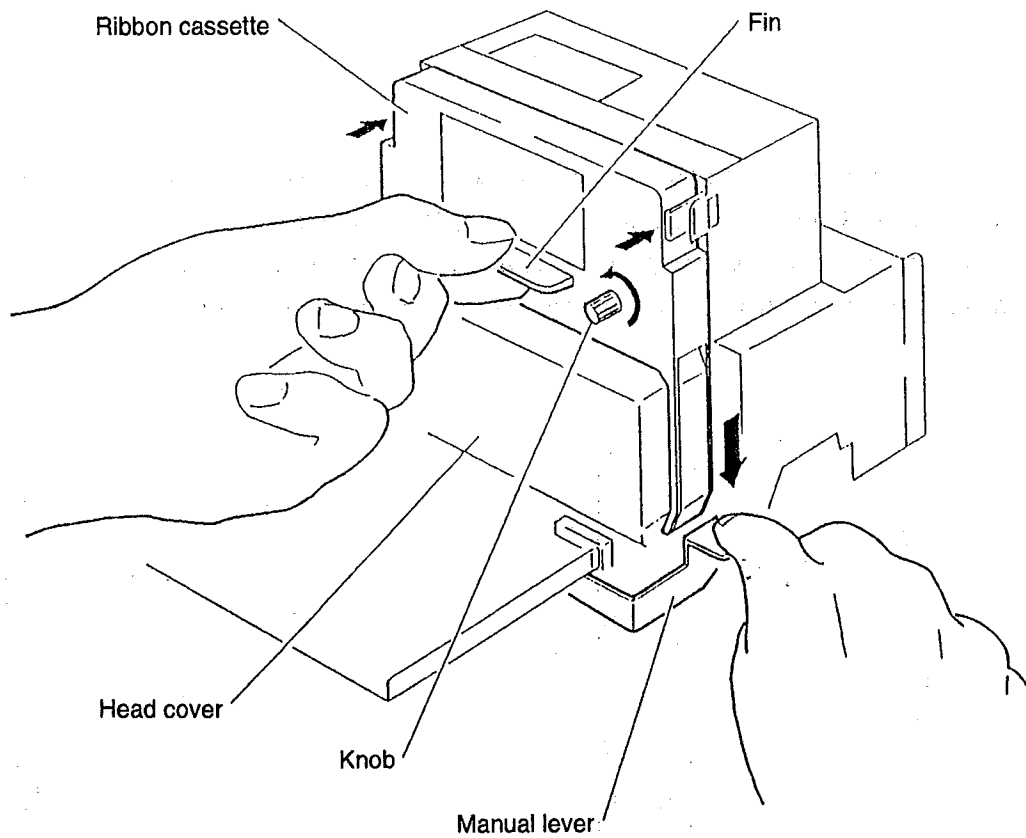
4.4 Setting the paper

1. Before inserting the paper, please make sure that the paper is free from following conditions.

Wrinkle   Folded   Wet

OK   No Good   No Good   No Good

Wave   Curl

No Good   No Good
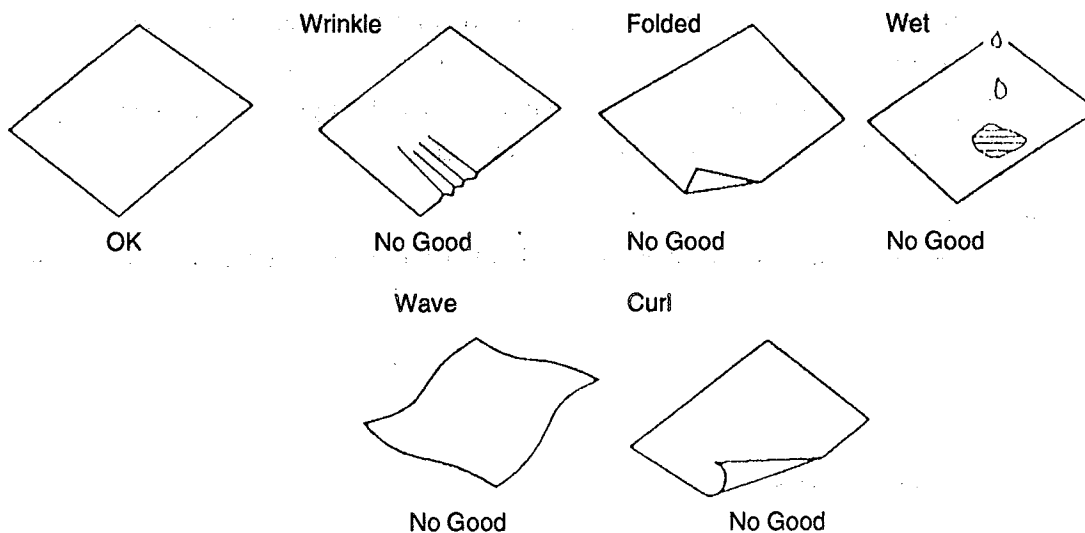
2. The number of papers is max. 3 copies and total paper thickness is max. 0.09 – 0.3mm.
3. Paper size is 80mm(W) × 90mm(L) – 182mm(W) × 257mm(L).
4. Please make sure to insert the paper along the paper guide wall on the paper table until it touches the paper stopper. Wrong paper insertion will cuase trouble in feeding the paper.

Paper guide wall   Paper

OK   No Good
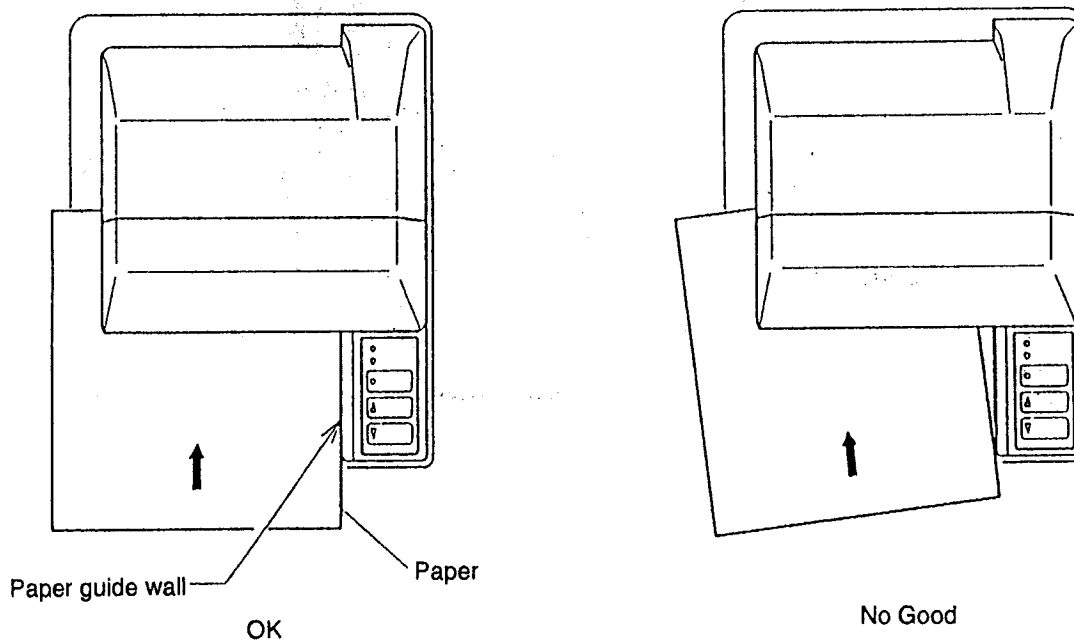
4.5 Installing the paper guide

1. Install the paper guide if the printer is used by the wall so that the paper won't be blocked by the wall.
2. Install the paper guide in the holes of the back of the printer.

Paper guide

Installation holes
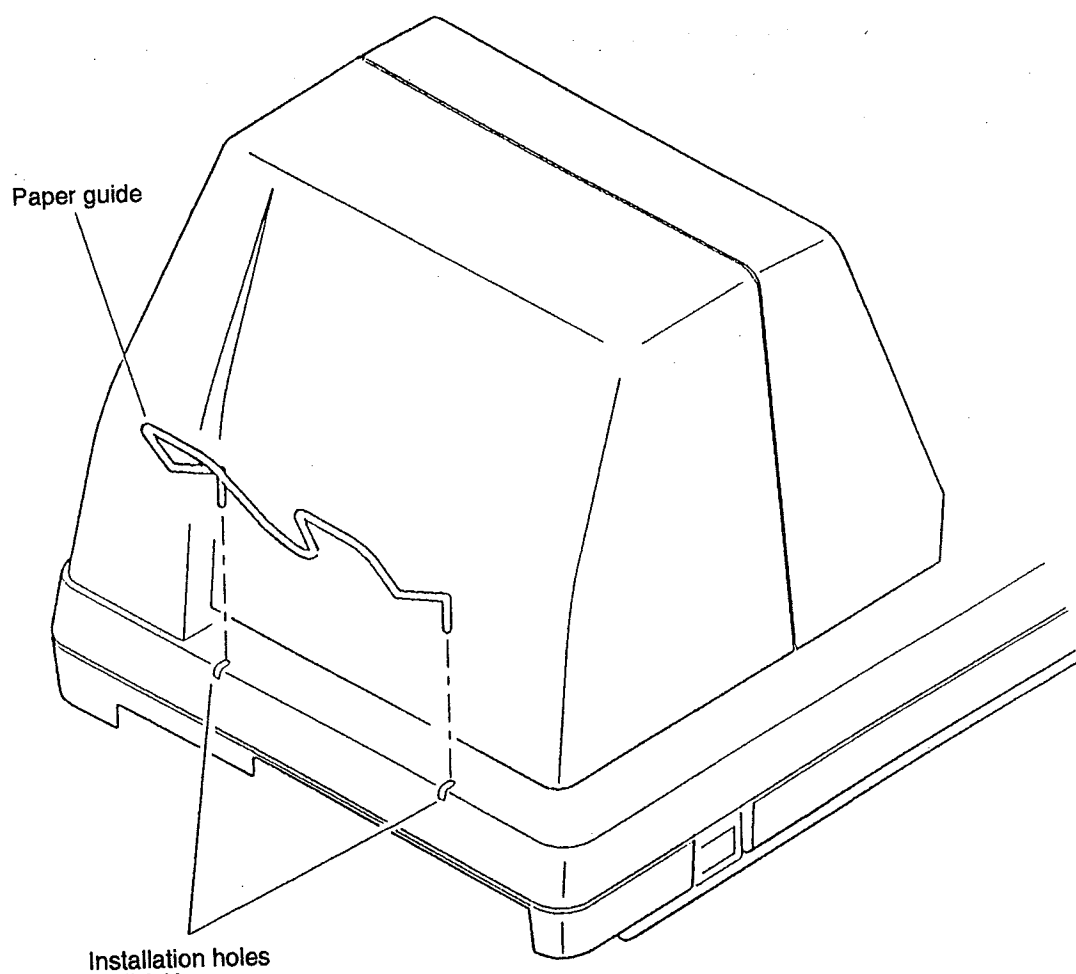
4.6 General cautions

1. Do not print without ink ribbon. It will damage the printer head.
2. Do not over use the ribbon before it is torn.
3. Do not drop foreign objects such as a clip or a pin.
4. When printing, place the printer on the flat and stable place. If the printer is unstable, printer may move as when it vibrates in printing. Also it causes operation error.
5. Do not put any weights on top of the printer.
6. When you clean the surface of the printer, please do not use organic liquid such as alcohol, thinner or benzine.

5. INTERFACE

5.1 RS-232C interface

1) Specifications
  (1) Synchronization: Asynchronous
  (2) Baud rate: User selection, 110, 150, 300, 600, 1200, 2400, 4800, 9600 bps
  (3) Word configuration:
    Start bit: 1 bit
    Data bit: User selection, 7 or 8 bits
    Parity bit: User selection, odd or even numbers or no parity
    Stop bit: More than 1 bit
  (4) Signal polarity
    Mark = Logic "1" (–3V to –12V)
    Space = Logic "0" (+3V to +12V)

2) Connector assignment

Pin no.	Signal name	Output/input	Function
1	FG	—	Frame ground
2	TXD	output	Out put data
3	RXD	input	Input data
7	GND	—	GND for signal
20	DTR	output	Data terminal is ready
14,15	NC		Connected inside
16,17	NC		Connected inside
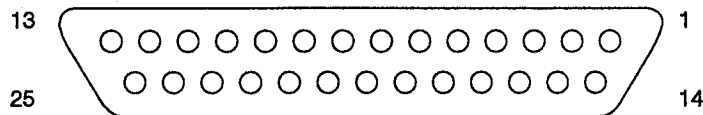
Notes)
  1. Signals for RS-232C are based in EIA RS-232C level.
  2. Always maintain "Mark State" when received data is not being transfered.
  3. 14, 15 and 16, 17 pin are connected on the board.
    Applicable connector (D-sub connector)
    Printer: 17LE-13250
    Cable: 17JE-23250

When a fault is detected in the mechanical block of the printer, DTR (20) has a Busy signal turned on. At the same time, the error status is output from TXD (2) and the PAPER OUT LED blinks.

To reset an error, turn off the power, eliminate a fault cause, and turn on the power again.

Output signal	
Bit	Description
0	BOF detection
1	TOB detection
2	Unused
3	Unused
4	Unused
5	Unused
6	Printer error
7	Unused

0 : No error, 1 : Error

6) Data receiving control

When DTR (20) is READY (Space), your printer receives data from the host, but it doesn't when it is BUSY (Mark).

7) Buffering control

Data transfer to the input buffer is controlled by the DTR (29) and TXD (2) signals.

8) Electrical characteristics

RS-232C circuit
Input (RXD)

(Printer Side)   **(Host Side)**
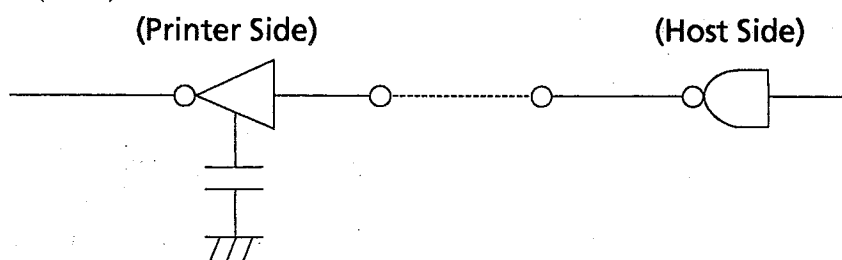
MAX232 or equivalent

Mark = (−8V): Stop bit
Space = (+8V): Start bit

Output (DTR, TXD)

(Printer Side)   **(Host Side)**
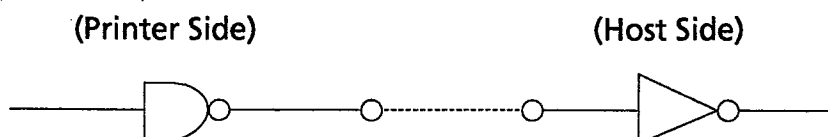
MAX232 or equivalent

DTR — (−8V): BUSY
            (+8V): READY
TXD — Mark = (−8V): 1
            Space = (+8V): 0

6. FUNCTION SELECTION (DIP SWITCH SETTING)

Please set before turn the power OFF. (lower ON, upper OFF)

DIP SW	ON	OFF
1		
2	International character set (ref: table 1)	
3		
4	7 bits	8bits
5	with Parity	without Parity
6	EVEN Parity	ODD Parity
7		
8	Baud rate setting (ref: table 2)	
9		
10	Unused	

International character set (table 1)

DIP SW-3	DIP SW-2	DIP SW-1	COUNTRY
ON	ON	ON	America
ON	ON	OFF	France
ON	OFF	ON	Germany
ON	OFF	OFF	England
OFF	ON	ON	Denmark
OFF	ON	OFF	Sweden
OFF	OFF	ON	Italy
OFF	OFF	OFF	Spain

Baud rate setting (table 2)

DIP SW-9	DIP SW-8	DIP SW-7	BAUD RATE
ON	ON	ON	110
ON	ON	OFF	150
ON	OFF	ON	300
ON	OFF	OFF	600
OFF	ON	ON	1200
OFF	ON	OFF	2400
OFF	OFF	ON	4800
OFF	OFF	OFF	9600

(bps)

7. PRINT CONTROL FUNCTION

7.1 Printer built-in function

1) Bufferful print

   When the print data go over max printing col., it prints data in print buffer automatically.

2) High speed print

   It starts printing after inputting 1 line data and at the same time it accepts the next data and print in high speed. It has 4k bytes input buffer built-in and it always allows data input.

3) Self print

   With the RELEASE, FORWARD, or REVERSE switch held down, turn on the power. You will enter the self print mode.

   The PAPER OUT and RELEASE LEDs blink alternately and the printer waits for the paper to be inserted. When the paper is inserted, the printer starts self printing and stops after printing certain lines.

   Since a no-paper check is not made during printing, use the paper long enough for self printing. (about 10 × 26-cm long paper)

   Pressing one of the RELEASE, FORWARD, and REVERSE switches restarts printing.

   To terminate the self print mode, turn off the power once.

7.2 Control code

	Functions	Code
LF	Paper feed command	0A (h)
FF	Paper discharge command	0C (h)
ESC d (n)	"n line" skip perforation command	1B (h) + 64 (h) + n
ESC e (n)	"n line" skip perforation in reversed direction command	1B (h) + 65 (h) + n
ESC 2	1/6 inch paper feed preset command	1B (h) + 32 (h)
ESC 3 (n)	n/24 inch paper feed preset command	1B (h) + 33 (h) + n
ESC h (n)	Paper feed in reversed direction set/cancel command	1B (h) + 68 (h) + n
HT	Horizontal tabs carried out	09 (h)
ESC D (nl) .. (nk) NUL	Horizontal tabs set command	1B (h) + 44(h) + nl... nk + 00 (h)
ESC ! (n)	Enlarged & underline set/cancel command	1B (h) + 21 (h) + n
ESC q	Paper release command	1B (h) + 71 (h)
ESC t (n)	Character code table command	1B (h) + 74 (h) + n
ESC R (n)	International character set command	1B (h) + 52 (h) + n
ESC @	Printer initial set command	1B (h) + 40 (h)
ESC sp (n)	Character space set command	1B (h) + 20 (h) + n
ESC c4 (n)	Paper end detection effective/ineffective command	1B (h) + 63 (h) + 34 (h) + n
ESC c5 (n)	Manual switch effective/ineffective command	1B (h) + 63 (h) + 35 (h) + n
ESC v (n)	Paper end status request command	1B (h) + 76 (h) + n
ESC M	7 × 7 font selection command	1B (h) + 4D (h)
ESC P	5 × 7 font selection command	1B (h) + 50 (h)
ESC { (n)	Inverted character set/cancel command	1B (h) + 7B (h) + n
FS W (n)	Enlarged in 4 times set/cancel command	1C (h) + 57 (h) + n
FS J	Print from top to bottom command	1C (h) + 4A (h)
FS K	Print from top to bottom cancel command	1C (h) + 4B (h)
FS j (n)	Character width in printing from top to bottom selection command	1C (h) + 6A (h) + n

7.3 Input data format

LF

Name : Paper feed command

Code : 0A (h)

Function : When there is data in the print buffer, printing will be performed. When there is no data in the buffer, line feed will be carried out. Default of line feed is 1/6 inch.

FF

Name : Paper discharge command

Code : 0C (h)

Function : Prints the data in the printing buffer and discharges the paper.

The paper is fed in the direction specified by ESC + h + n until the no-paper status is detected. This is done even if no-paper detection is disabled. When the paper end status is requested by ESC + V 01h, the no-paper status is sent once to the host upon completion of FF.

ESC d (n)

Name : "n" line skip perforation command

Code : 1B (h) + 64 (h) + n

Function : Print the data in the print buffer and feeds the paper "n" lines. It will feed in the direction set by ESC + h + n. ($0 \leq n \leq 255$)

No line feed when n is "0".

ESC e (n)

Name : "n" line skip perforation in reversed direction command

Code : 1B (h) + 65 (h) + n

Function : Print the data in the print buffer and feeds the paper "n" lines in reversed direction. ($0 \leq n \leq 255$)

No line feed when "n" is "0".

ESC 2

Name : 1/6 inch paper feed preset command.

Code : 1B (h) + 32 (h)

Function : Set line feed pitch to be 1/6 inch.

When power is "ON", 1/6 line feed is set initially.

ESC 3 (n)

Name : n/24 inch paper feed preset command

Code : 1B (h) + 33 (h) + n

Function : Set line feed pitch to be n/24 inch.

This will also be the Paper feed amount operated by the panel switch. ($0 \leq n \leq 255$)

ESC h (n)

Name : Paper feed in reversed direction set/cancel command

Code : 1B (h) + 68 (h) + n

Function : n = 00h cancellation of reversed direction paper feed (default)

n = 01h setting of reversed direction paper feed.

HT

Name : Horizontal tabs carried out command

Code : 09 (h)

Function : Move printing location to the next tab setting place.

When the power is on, horizontal tabs are set initially at every 8 characters. Tab setting command in the non-commandable area will be ignored.

ESC D (n1) .. (nk) NUL

Name : Horizontal tabs set command

Code : 1B (h) + 44 (h) + n1 .. nk + 00 (h)

Function : "n" indicates the number of columns and horizontal tabs place will be set at "n" columns. $(1 \leq n \leq 255, 1 \leq k \leq 32)$

Tabs will be set in order of smaller numbers and setting will be finished if the order is reversed. Also, Tab setting will be finished by NUL (00) command.

When the power is on, tabs are set initially at every 8 characters.

ESC ! (n)

Name : Enlargement set/reset & underline set/reset command

Code : 1B (h) + 21 (h) + n

Function : Selects a $7 \times 7/7 \times 9$ font or $5 \times 7/5 \times 9$ font, sets double-width enlargement, and sets the underline function.

n is as shown in the below table. (A default value is n = 00h)

The $7 \times 7/5 \times 7$ font is for the 7-pin head mechanism, and $7 \times 9/5 \times 9$ font is for the 9-pin head mechanism.

Bit	1	0
0	Select $7 \times 7/7 \times 9$ font	Select $5 \times 7/5 \times 9$ font
1	Unused	Unused
2	Unused	Unused
3	Unused	Unused
4	Unused	Unused
5	Set double-width enlarged print	Reset double-width enlarged print
6	Unused	unused
7	Set underline	Reset underline

Example) When the 7×7 font is selected and the underline function is set, n will be 81h.

ESC q

Name   : Paper release command

Code   : 1B (h) + 71 (h)

Function   : This command will operate paper release and have RELEASE LEAD lit. However if there is data in the print buffer, this command will be ignored.

ESC t (n)

Name   : Character code table set command

Code   : 1B (h) + 74 (h) + n

Function   : Entering this code switches the 80H to FFH code tables (graphic area). (A default value is n = 00h)

	ROM Address Table			
	Value of n	5 × 7 font	7 × 7 font	Vertical printing font
7-pin mechanical spec.	00h	3000 (h)	3C00 (h)	5400 (h)
	01h	3300 (h)	4100 (h)	5800 (h)
	02h	3600 (h)	4600 (h)	5C00 (h)
	03h	3900 (h)	4B00 (h)	6000 (h)
9-pin mechanical spec.	Value of n	5 × 9 font	7 × 9 font	Vertical printing font
	00h	3180 h)	3F80 (h)	5B80 (h)
	01h	3500 (h)	4580 (h)	5F80 (h)
	02h	3880 (h)	4B80 (h)	6380 (h)
	03h	3C00 (h)	5180 (h)	6780 (h)

ESC R (n)

Name   : International character set command

Code   : 1B(h) + 52 (h) + n

Function   : This command will switch to a selected character.

(Default will be decided by DIP switch. However "n" number has to be from 0 to 7.)

n	Country	n	Country
0	America	6	Italy
1	France	7	Spain
2	Germany	8	Japan
3	England	9	Norway
4	Denmark	10	Denmark 2
5	Sweden		

ESC { (n)

Name : Inverted character set/cancel command

Code : 1B (h) + 7B (h) + n

Function : Command setting/canceling Inverted character print.

        n = 00h   Inverted character cancellation

        n = 01h   Inverted character setting

        (Default : n = 0)

        This command is effective only at the beginning of lines.

        (Inverted character printing is to print a character 180 degrees upside down.)

FS W (n)

Name : Enlarged character in 4 times set/cancel command

Code : 1C (h) + 57 (h) + n

Function : Command setting/canceling printing enlarged character in 4 times.

        n = 00h   Enlarged 4 times cancellation

        n = 01n   Enlarged 4 times setting

        (Default : n = 0)

        This command is effective at any point. If it is mixed with normal characters, the bottom of characters will be even.

FS J

Name : Vertical printing set

Code : 1C (h) + 4A (h)

Function : Sets vertical printing. This command is effective at any position.

        Mixture with horizontal printing characters is allowed for the 5×7 or 5×9 font. When vertical printing is set, double-width enlargement doubles the characters in the vertical direction.

        (Vertical printing refers to printing the characters by rotating them 90° in the counter-clockwise direction.)

        The vertical printing font has another font table different from regular horizontal characters.

FS K

Name : Print from top to bottom cancel command

Code : 1C (h) + 4B (h)

Function : Cancel printing from top to bottom.

FSj (n)

Name : Character width in printing from top to bottom/from right to left select command
Code : 1C (h) + 6A (h) + n
Function : Select character width in printing from top to bottom or printing from right to left.
     n = 00h   normal character width selection
     n = 01h   character in twice width selection
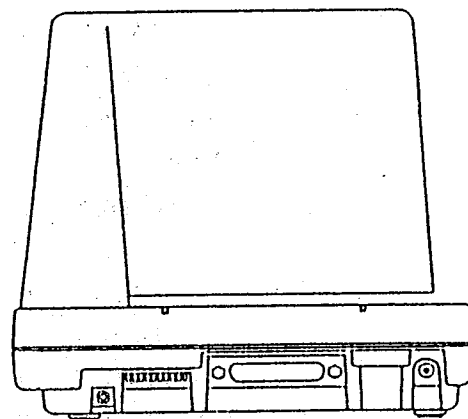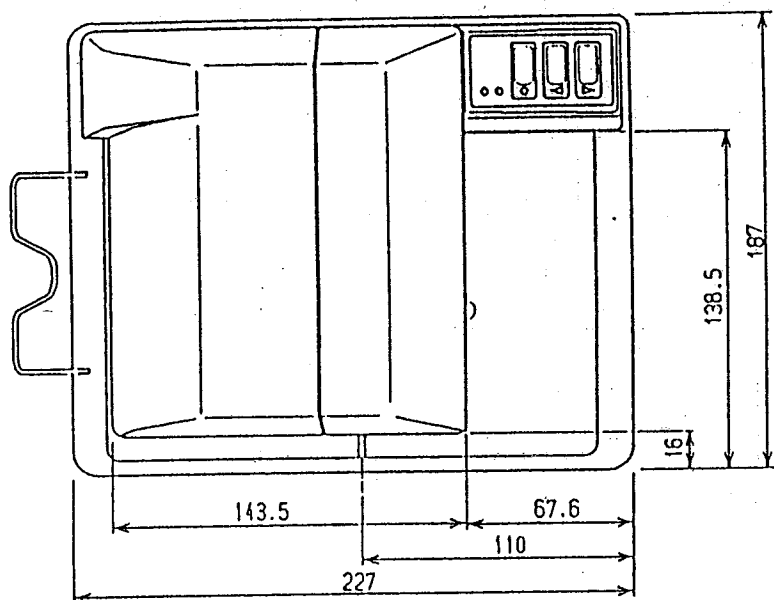   (same as the size set by ESC ! (n))

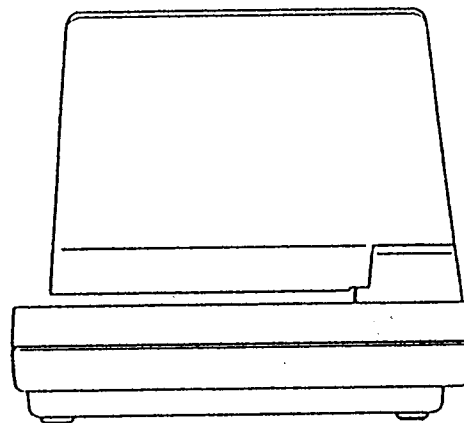## CR

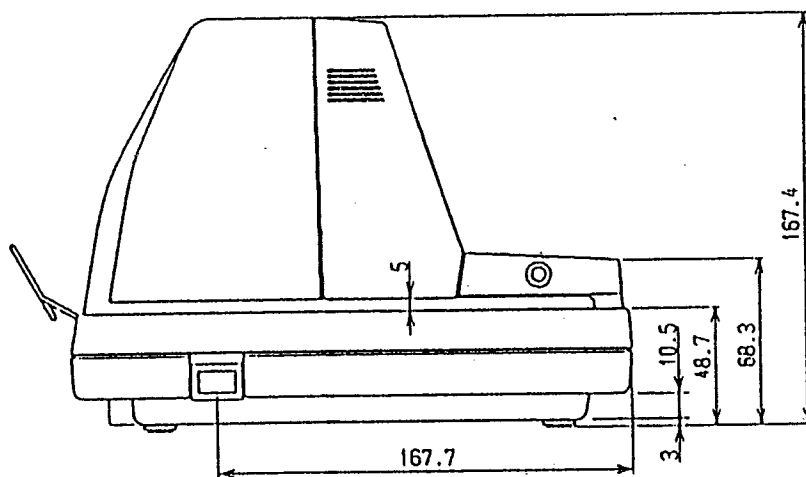Name : Carriage return command
Code : 0D (h)
Function : This code is ignored at printer side.

9. EXTERNAL DIMENSIONS

9.1 Printer external dimensions (in mm)

Seeing from the back

10. SUPPLEMENT

Character data format

<5 x 7 font> (7pin mechanism)

Data consists of 6 bytes per character.

In normal ANK format, dots are not set in order to keep the last 1 byte as a space between characters. (The 6th byte)
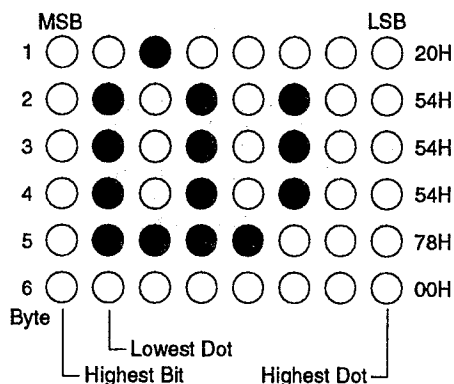
When half-dot is not used, printing dots which are next to each other is possible.

The highest bit (the 7th bit) is not used and the 6th bit indicates the lowest dot and the 0 bit indicates the highest dot.

Printing dot data is "1" and non-printing data is "0".

Therefore the highest bit (the 7th bit) is "0".

ANK example:

This is an example of "a" 61H code.

Character data are 20H, 54H, 54H, 54H, 78H, 00H.

Graphic character example:
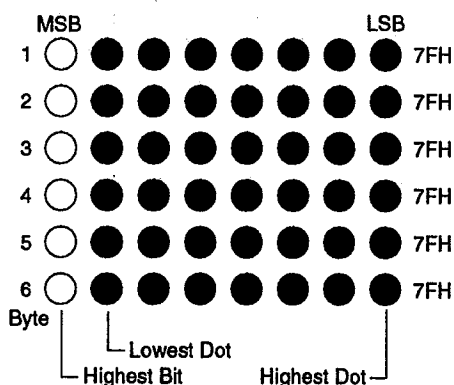
This is an example of graphic character 8EH code.

Character data are 7FH, 7FH, 7FH, 7FH, 7FH, 7FH.

As there is no space between characters, there is printing data at the 6th byte.

Character Generator Data Format

[5 × 9 Font] (9-pin Head)
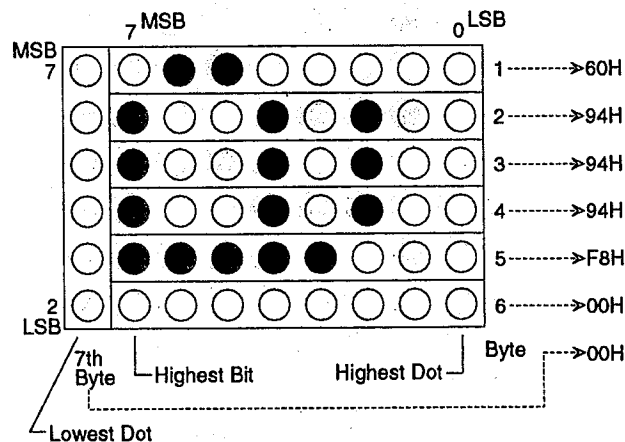
This data has one character composed of 7 bytes.

For a regular alphanumeric format, the 6th byte is secured as an inter-character space and no dots are set.

The 7th byte represents the lowest bit of the character. (9th dot of the character). The highest bit (bit 7), which is the 6th byte from 1, represents the 8th dot of the character, and the bit 0 represents the highest dot of the character (1st dot of the character).

Since half dots are not used, adjacent dots can be also printed.

The data for printed dots is "1", and that for unprinted ones is "0".
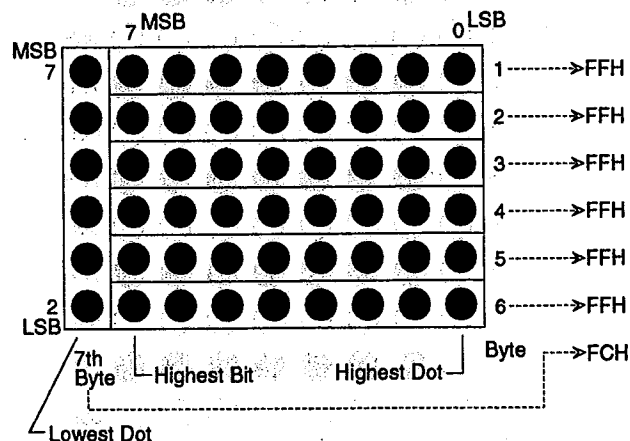
Example of alphanumeral:

This example shows a code of "a" 61H.

This character generator data is 60H, 94H, 94H, 94H, 0F8H, 00H, 00H.

Example of graphic character:

This example shows a code of the graphic character 8EH.

The character generator data is 0FFH, 0FFH, 0FFH, 0FFH, 0FFH,0FFH, 0FCH.

Since there are not inter-character spaces, the 6th byte also has the printing dot data.

[7 × 9 Font] (9-pin Head)
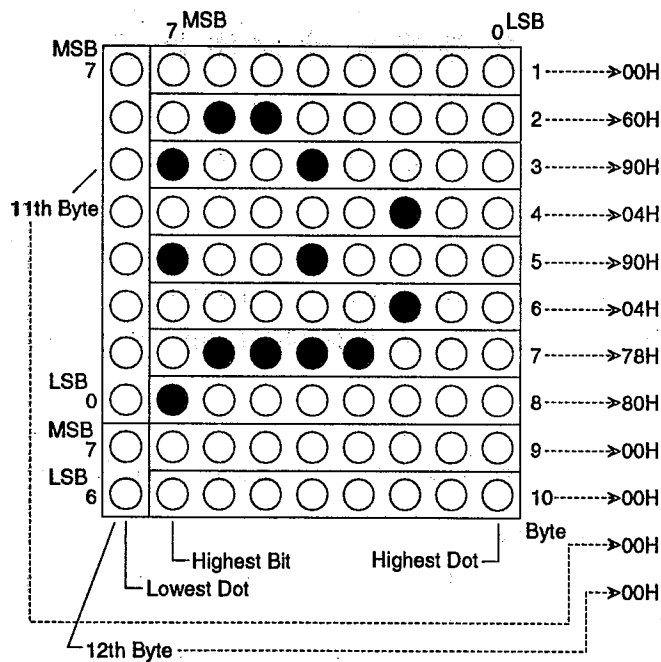
This data has one character composed of 12 bytes.

For a regular alphanumeric format, the 9th and 10th bytes are secured as inter-character spaces and no dots are set. Since half dots are used, the adjacent dots cannot be printed.

The 11th and 12th bytes represent the lowest dots. (9th dot of the character)

The highest bit (bit 7), which is the 10th byte from 1, represents the 8th dot of the character, and the bit 0 represents the highest dot of the character.

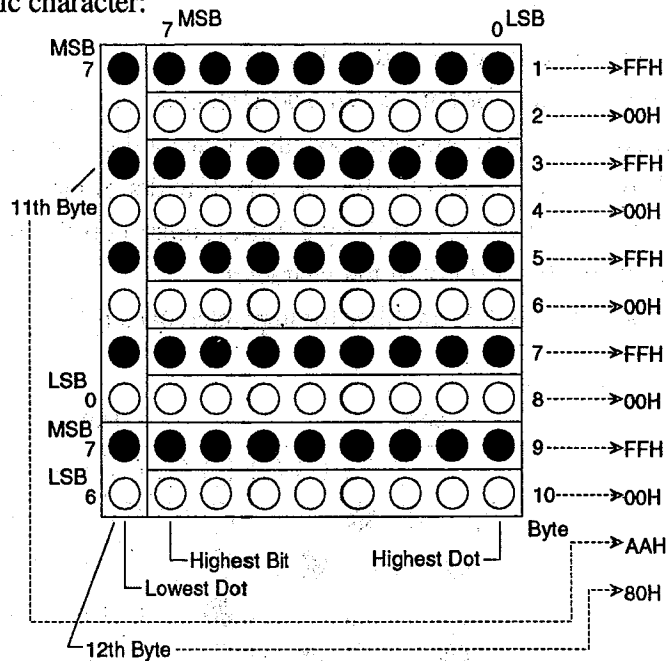The data for printed dots is "1", and that for unprinted ones is "0".

Example of alphanumeral:

This example shows a code of "a" 61H.

The character generator data is 00H, 60H, 90H, 04H, 90H, 04H, 78H, 80H, 00H, 00H, 00H, 00H.

Example of graphic character:

This example shows a code of the graphic character 8EH.

The character generator data is 0FFH, 00H, 0FFH, 00H, 0FFH, 00H, 0FFH, 00H, 0FFH, 00H, 0AAH, 80H.

[5×7 Vertical Printing Font] (Common to 7-pin and 9-pin Heads)

This data has one character composed of 8 bytes.

For a regular alphanumeric format, the last one byte is secured as an inter-character space and no dots are set. (8th byte)
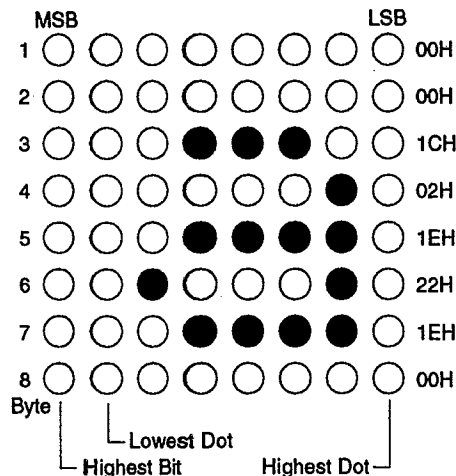
Since half dots are not used, the adjacent dots can be also printed.

The highest bit (bit 7) is not used. The bit 6 represents the lowest dot of the character, and the bit 0 the highest dot of the character.

The data for printed dots is "1", and that for unprinted ones is "0".

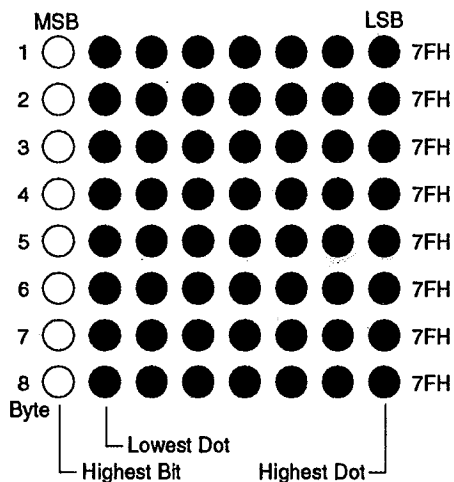Therefore, the highest bit (bit 7) will be "0".

Example of alphanumeral:

This example shows a code of "a" 61H.

The character generator data is 00H, 00H, 1CH, 02H, 1EH, 22H, 1EH, 00H.

Example of graphic character:

This is an example of all dots painted.

The character generator data is 7FH, 7FH, 7FH, 7FH, 7FH, 7FH, 7FH, 7FH.

Since there are no inter-character spaces, the 8th byte also has the printing dot data.

Notes for Creating the Font Table

When performing half-dot printing, the following notes are required in printing double-width or quadruple characters.

For 7 × 7 font;

When printing the double-width of quadruple characters, the 10th byte of the font is not printed due to composition of the font data.

For 7 × 9 font;

When printing the double-width or quadruple characters, the 10th byte of the font is not printed due to composition of the font data. Also, the bit 6 of the 12th byte is not printed.

Care should be taken when composing one character with two bytes by dividing it into left and right parts such as Kanji.

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