CITIZEN

User's Manual

MINI DOT MATRIX PRINTER

MODEL **iDP-3535**

Japan CBM Corporation
Information Systems Div.

IMPORTANT SAFETY INSTRUCTIONS
- Read all of these instructions and save them for later reference.
- Follow all warnings and instructions marked on the product.
- Unplug this product from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
- Do not use this product near water.
- Do not place this product on an unstable cart, stand of table. The product may fall, causing 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 form 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 product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
- This product should be operated from the type of power source indicated on the marking label. If you're not sure of the type of power available, consult your dealer or local power company.
- Do not allow anything to rest on the power cord. Do not locate this product where the cord will be walked on.
- In an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet dose not exceed 15 amperes.
- Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
- 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 product 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 product.
  C. If the product has been exposed to rain or water.
  D. If the product dose not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
  E. If the product has been dropped the cabinet has been damaged.
  F. If the product exhibits a distinct change in performance, indicating a need for service.

IMPORTANT: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

CAUTION: Use shielded cable for this equipment.

CONTENTS

1. Introduction

The iDP 3535 is a dot impact printer which can be utilized for a wide range of applications, such data communications terminals, P.O.S. terminals and kitchen printers.
High speed performance is made possible by a bi-directional printing system and, since this printer is compact, lightweight and equipped with an abundance of functions, it can be easily employed for a variety of different tasks.

Before using the printer, please read this manual carefully to be certain you have an adequate understanding of its operation.

1-1 Features

1) Desktop compact dot impact printer.
2) High speed printing (Bi-directional printing system).
3) Black & Red 2 color printing and all black or purple printing.
4) Paper near-end detection function.
5) Low power consumption.
6) Optional paper winder and cash drawer are available.

1-2 Accessories

1) Paper roll   1 Pc.
2) Ribbon cassette   1 Pc.
3) Rear cover   1 Pc. (Friction model only)
4) Paper Stacker   1 Pc. (Pin tracter model only)
5) User's manual   1 Pc.

2. Basic Specifications

2-1 Type classifications
Printer types are classified according to the system shown below.

| iDP-3535 | F
P | 23
28
40 | P
R | F | 120
230 | E
U |

iDP3535   F   40   R   F   120   U

Model

Paper feed system
F: Friction
P: Pin tracter

Column capacity
23: 23 columns
28: 28 columns
40: 40 columns

Interface
P: Parallel
R: Serial RS-232C

Power source
120: AC 120V
230: AC 230V

Character set
J: Japanese
F: International

External device control
E: E-type (For Europe)
U: U-type (For USA)
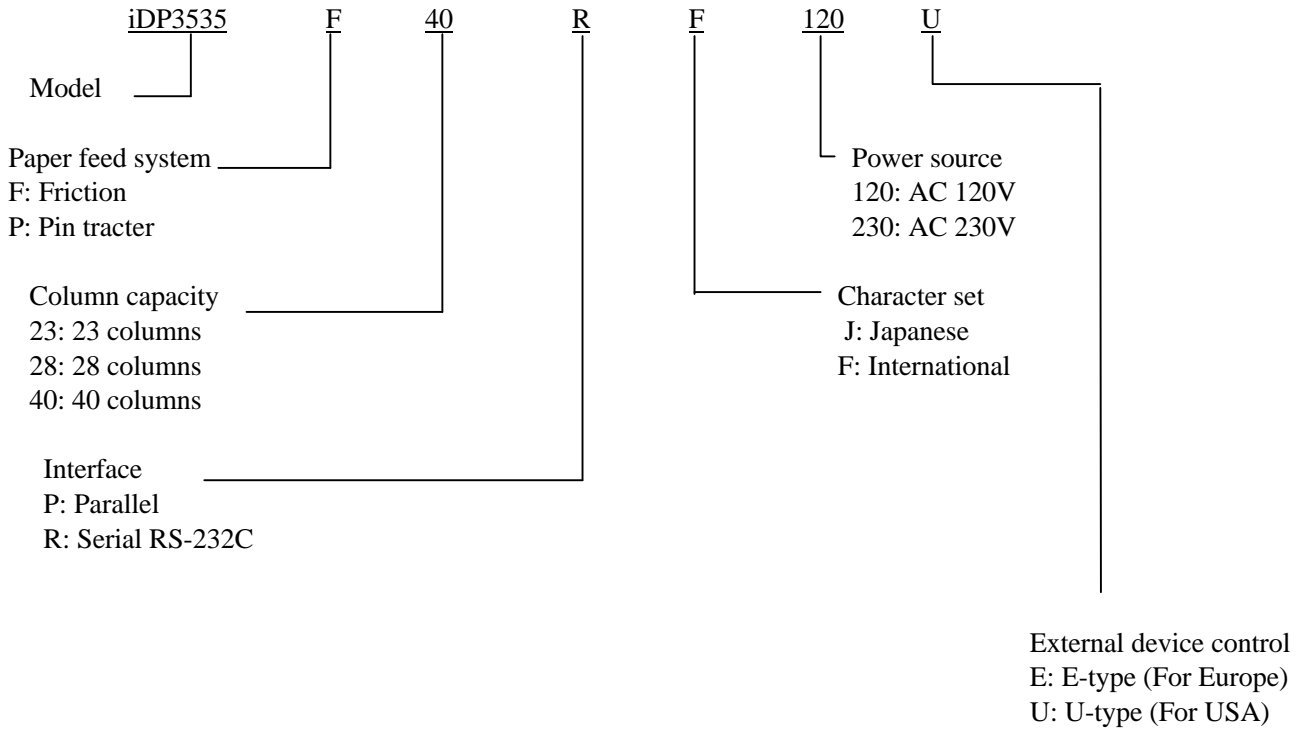
2-2 Features

	Item	iDP3535F	iDP3535P
1	Print Method	Bidirectional serial dot impact method.	
2	Character composition	7 x 7 dots (Incl. Half dot).	
3	Character number per line	23 columns: 230dot / line. 28 columns: 280dot / line. 40 columns: 360dot / line.	
4	Print speed	23 columns: approx. 4.0 line / sec. 28 columns: approx. 3.5 line / sec. 40 columns: approx. 3.0 line / sec.	
5	Character size	23 columns: 1.8(W) x 2.4(H) mm 28 columns: 1.5(W) x 2.4(H) mm 40 columns: 1.36(W) x 2.4(H) mm	
6	Line pitch	4.23 mm (1/6 inch)	
7	Paper size	76±0.5(W) x 80(Dia.)mm *1*4 3(W) x 3(Dia.)inch.	76-89 (W) mm 3.0-3.5 (W) inch.
8	Interface	P: Parallel interface (8 bit). R: Serial interface (RS-232C).	
9	Paper end detector	When paper is near the end, print operation is interrupted.	
10	Ribbon cassette	Two color (Black / Red) print. IR-61R / B *2	
11	Paper winder and Cash drawer	Winder: Option Ref. To 3-2(8) Drawer: Solenoid 24V, 36 Ω or more.	
12	Power voltage	120V ± 10% 60Hz (For United States).*3 230V ± 10% 50 / 60Hz (For Europe).	
13	Power Consump.	Approx. 30W.	
14	Operation temp. & humidity	0°C to 40°C / 32°F to 104°F. 10% to 85% RH.	
15	Storage temp.	-20°C to 60°C	
16	Net weight	Approx. 2.8Kg (6.2ib)	
17	External dimensions	160 (W) x 184 (D) x 173 (H) (without Knob and Rear cover	

Notes:　　*1 Paper weight of 45 kg refers to 1,000 sheets of 788 x 1,091 mm.

*2 Single color cassette ribbon is available as option.

Black print : IR-61B

Purple Print : IR-61P

*3 Power voltage setting is performed at the factory.

*4 The diameter of the core of the roll paper should be 12 mm (internal) and 18 mm (external) and the core should not be glued.

3. External Appearance and Parts Descriptions

3-1 External Appearance and Parts names
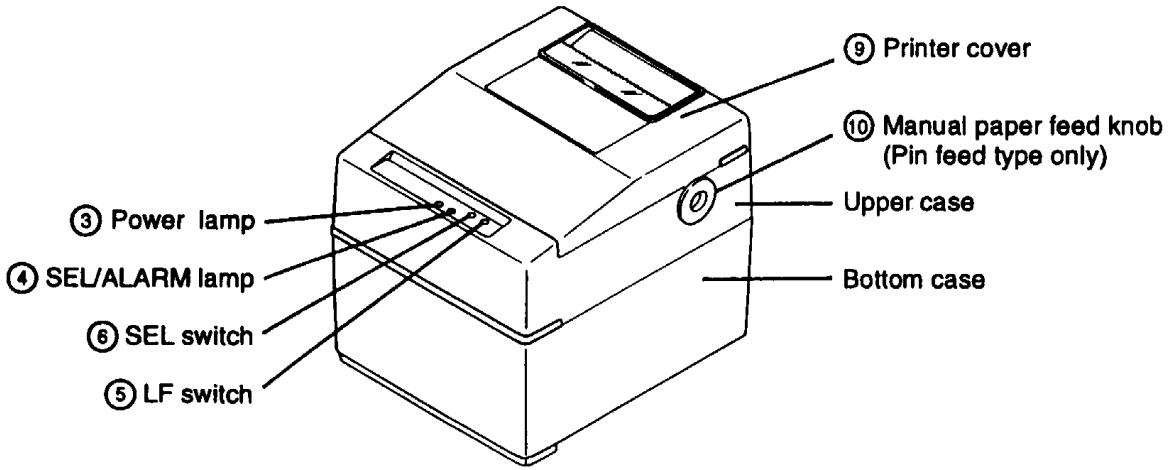

Fig.1

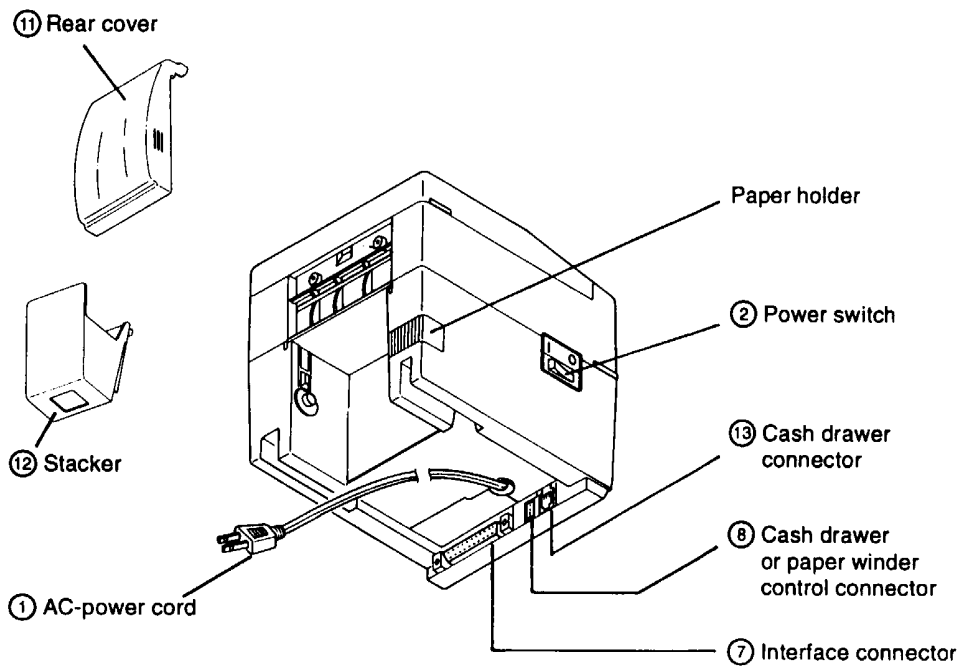

Fig.2

3-2 Parts Descriptions

(1) Power Cord   Insert the plug end into an electric outlet. The socket-outlet should be installed near
                         the equipment and should be easily accessible.
(2) Power Switch   Power is supplied to the printer by turning this switch on.
(3) Power Lamp   This lights up when the power switch is "ON" and goes out when turning "OFF".
(4) SEL / ALARM Lamp   This lights up when the printers is in SELECT state (ON-LINE) and goes out when
                         in DESELECT state (OFF-LINE).
                         The printer can print out the data only when this lamp is on.
                         This lamp may blink on the following occasions.
    1) When the paper roll in coming to near-end, the SEL / ALARM lamp keeps blinking
       at interval of 1.0 second.
       In this status, if you want to print out the data in the input-buffer, press the SEL switch two times.
       First press is cleared an alarm condition (ALARM RESET) and then one line print will be done
       by second press.
    2) When the printer is in alarm state, this lamp keeps blinking at interval of 1/4 second.
       Remove the cause for alarm and press the SEL switch. (or re-switch the power on).

(5) LF Switch   Paper feeding is performed when this switch is pressed
                         (in DESELECT status only).
                         This is used when inserting the paper and for spacing up etc.
(6) SEL Switch   When this switch is pressed, the printer enters SELECT (ON-LINE) status.
                         When pressed again, the printer enters DESELECT (OFF-LINE) status.
                         This switch is also used when clearing an alarm condition.
(7) I / F Connector   Connects through a cable to a computer etc. Please be certain that power to both
                         the printer and the computer are turned off when connection is made.

(8) Cash Drawer or Paper Winder Connector
                         To be used to control the P.O.S. cash drawer or paper winder by
                         DIP SWITCH setting (Ref.7-1).
                         When this connector is used for each drawer solenoid voltage 24V,
                         register over 36   , for paper winder, use CBM model AW-3.

Connector Pin Assignment		
Pin No	Signal Name	Function
1	Vp	DC24V, 0.8A or less
2	VL	Solenoid
3	PG	GND
4	PG	GND
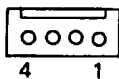
Connector : Printer side
: 5045-04A (MOLEX)

(9) Printer Cover   Open when replacing the cassette ribbon and paper.
(10) Manual Paper Feed Knob
                               Use to adjust the paper position (available only on pin tractor paper feeding model).
(11) Rear Cover   Cover for roll paper.
(12) Stacker   Basket for fan-fold paper.
(13) Cash Drawer Connector
                               This connector is used to drive cash drawers. (Ref.7-4)

4. Preparation

4-1 Inserting / Removing the Printer Cover

Inserting and removing the printer cover as shown in Fig. 3.
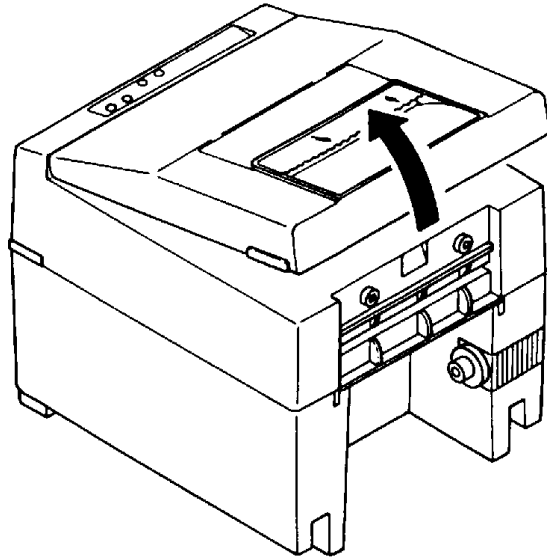
Fig. 3

4-2 The Ribbon Cassette Installation

To insert a ribbon, disconnect the power source beforehand. When the printer has been printing for many hours, be careful not touch printer head as it might be hot.

1) Remove the printer cover
2) While inserting the ribbon into the space between the print head and the ribbon guide, press the cassette into the holder unit until it clicks into place. (Ref. To Fig. 4&5)
3) Turn the cassette ribbon knob in the direction of the arrow to take up slack in the ribbon.
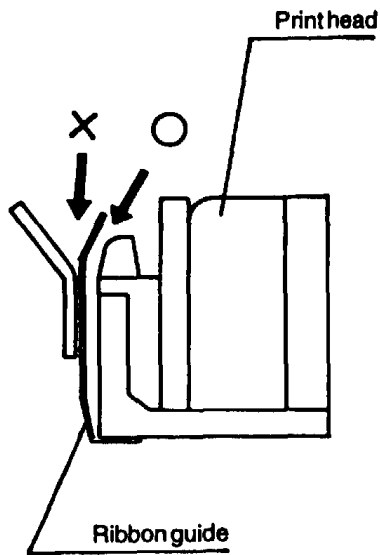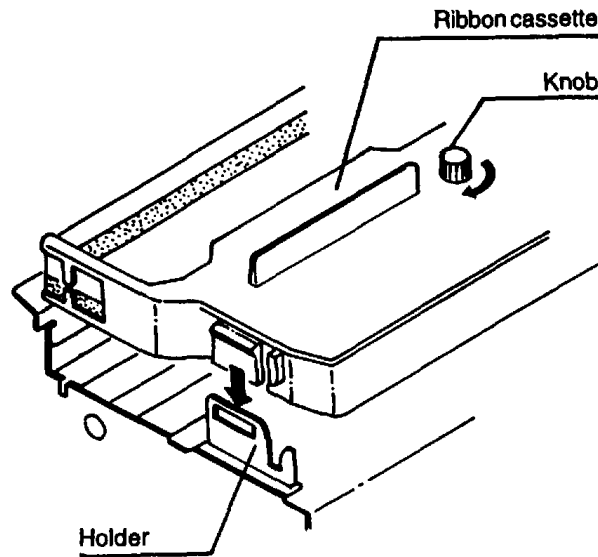
Fig. 4   Fig. 5

4-3 Loading and Changing the Paper

Using Paper Roll
1) Cut the paper in right angle to its longitudinal center line as shown in Fig. 7.
2) Insert the paper into insertion inlet on the rear side of printer.
3) Turn on the power switch and feed the paper by pushing the LF switch.
4) When the printing paper comes out of the clearance (paper cutter part) on the printer cover, fix the paper by means of paper holder, then set in on the main unit.

Fig. 7

Insertion inlet

Paper holder

Fig. 6
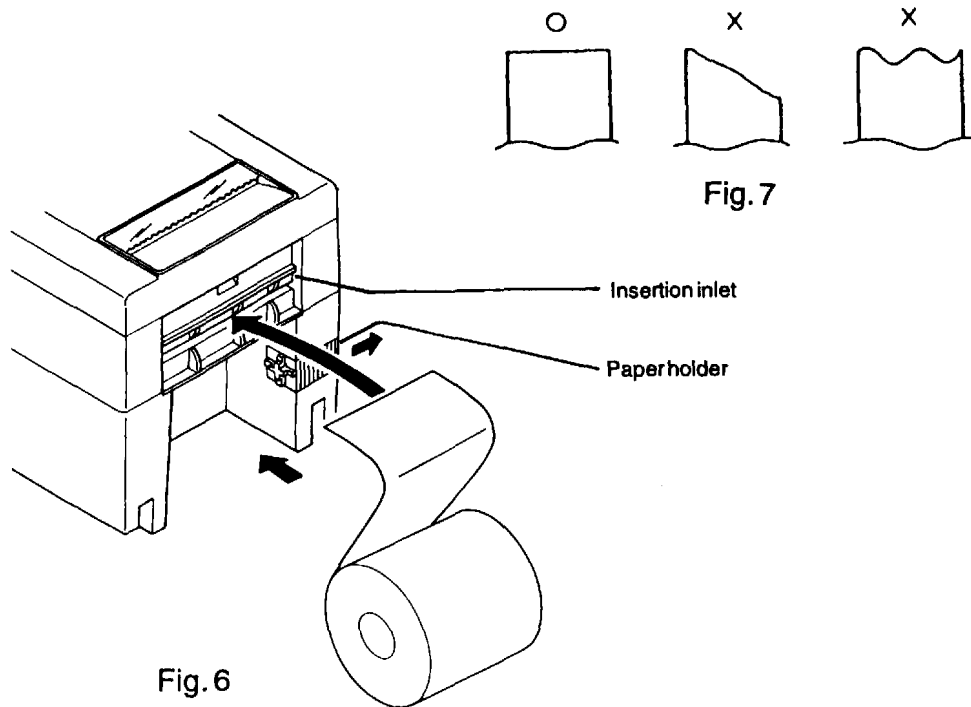
Using Fan-fold Paper

1) Remove the printer cover.
2) Set the imprint face of the paper down ward and put into the paper entrance.
3) If necessary to adjust the sprocket-wheel's position, free the wheels using the lever on both side. Slide them to the appropriate position, and lock them back.
4) Hook some of the paper's perforations on the sprockets and forward the paper into the printer mechanism by pulling and turning the paper-feed knob until the paper's tip reaches the platen.
5) The unlock the levers of the sprocket and match the marks (3 or 3.5 inches) with the width of the paper. Then lock them back.
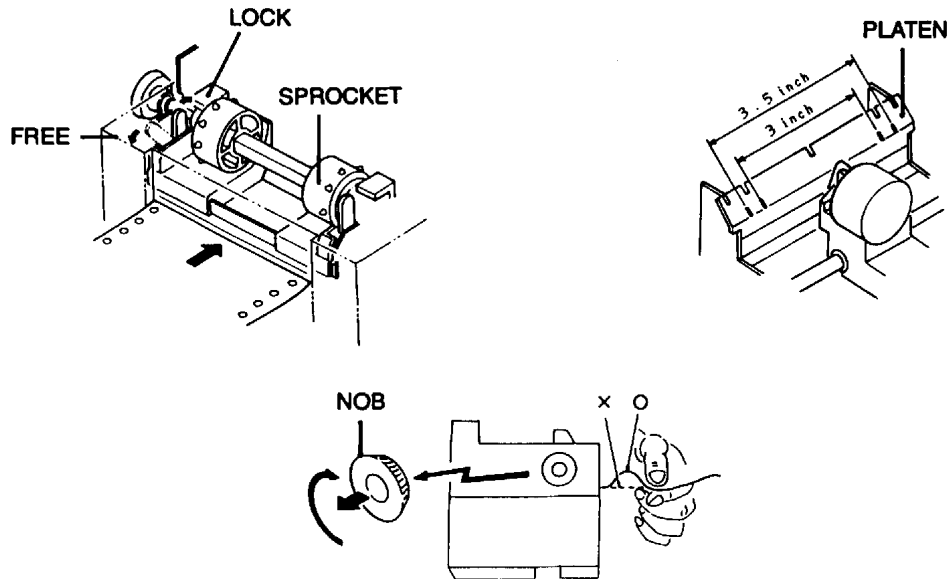
Fig. 8

4-4 Inserting / Removing the Paper Cover and Stacker

1) Inserting and removing the paper cover and the stacker as shown in Fig. 9, 10.
2) Capacity of stacker
   The maximum size of fun-fold paper sheet which can be stored in this stacker is 3 to
   3.5 (W) x 6 (H) x 1.6 (D) inches.
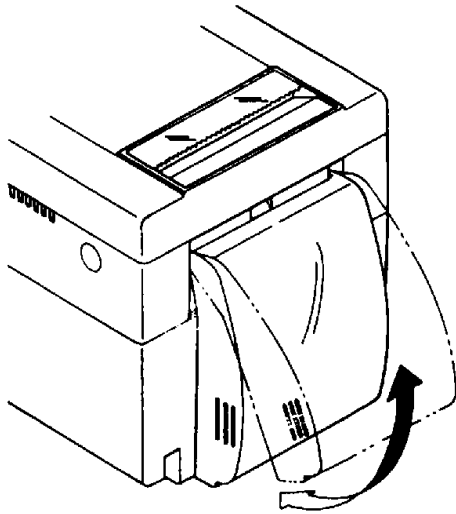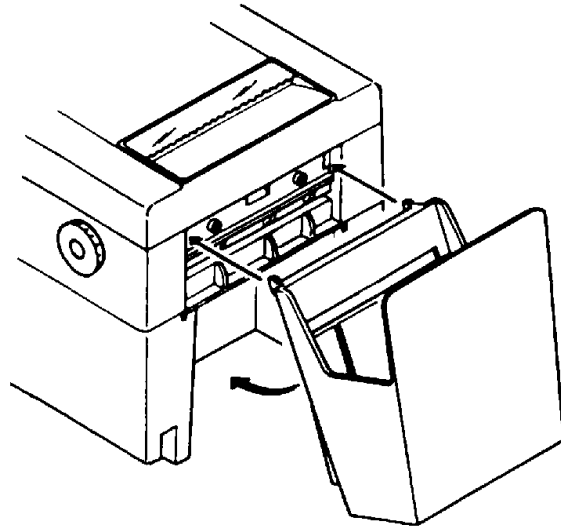
Fig. 9   Fig. 10

4-5 Self Test Printing

Your printer has a built in self print function for purpose of checking print operation without the need
for any other external device.

Procedures for Actuating the Print Function
1) Be sure that a paper roll is properly loaded.
2) Confirm that the Ribbon cassette is properly installed and turn the power switch off.
3) Turn the power switch ON while pressing the LF switch, and release the LF switch after the self test operation
   has begun.

In the above operation, the self print function will stop automatically when completed.
However, the self print function will not operate without paper.

4-6 Alarm and Paper Near-End Detection

This printer has the paper near-end sensor to stop the operation when the paper comes to near-end, sending out
both BUSY and FAULT signals. This status is indicated by the SEL / ALARM lamp blinking at an interval of 1.0
second.
If the printer goes alarm, the printer stops printing out and outputs FAULT signal – OFF-LINE state. This status
makes the SEL / ALARM lamp blink at an interval of 1/4 second.

4-7 General Cautions

1) Never operate your printer without loading paper and ribbon cassette. Any printing without paper and ribbon cassette may cause damage to printer head.
2) Replace ribbon cassette before it is worn with rents.
3) Be careful not to drop any foreign matters, such as paper clips, pins and the like into your printer. These can cause mechanical trouble.
4) Nothing shall be placed on the ventilation vents of the printer.
5) Always place your printer on a stable desk which is set horizontal.
6) No organic solvent (thinner, benzene or the like) should be used in cleaning the surface of the main body case.
7) Make sure that the power of the printer is turned off whenever you do the following.
(1) Taking out any foreign matter which was dropped into the printer.
(2) Replacing the ribbon cassette.

8) Please use Cash Drawer connector (CN 6) for drive Cash Drawer only.

For U-type (USA type)
Do not use Paper winder and Cash Drawer with connectors (CN 6-2 and CN 3-2) at the same time.

USAGE OF THE CONNECTORS, PLEASE SEE PAGE 18 AND 19.

5. Serial Interface

5-1 Specifications

1) Synchronism	: Asynchronous
2) Baud rate	: 1200, 2400, 4800, 9600 BPS
	(Selected by user)
3) Composition of one word	: Start bit : 1 bit
	: Data bit : 7 or 8 bit
	(selected by user)
	: Parity bit : Odd, even or parity
	(selected by user)
	: Stop bit : 1 bit or more.
4) Signal polarity	: RS-232C : Mark = Logic "1"
	(-3V to -12V)
	: Space = Logic "0"
	(+3V to +12V)
4) Receiving Control (DTR signal)	
	: RS-232C : Mark = Data transfer not possible
	: Space = Data transfer possible

5-2 Connector Pin Assignment

Pin No.	Signal Name	Direction Host / Printer	Function	RS-232C
1	FG		Safety Ground	
3	RD	→	Received Data	O
7	SG		Signal Ground	
14	FAULT	←	Printer ALARM Signal	O
20	DTR	←	Printer BUSY Signal	O

Notes: 1. The signal for RS-232C use are based on EIA RS-232C level.
2. Please always maintain the "Mark state", when received data is not being transferred.
3.Compatible connector (D-Sub connector)
Printer side: Equivalent to AMPHENOL 17-13250
Cable side: Equivalent to AMPHENOL 17-23250

5-3 Input / output Signals

RS-232C Circuit
Input (RD)
    [Printer side]   [Host side]
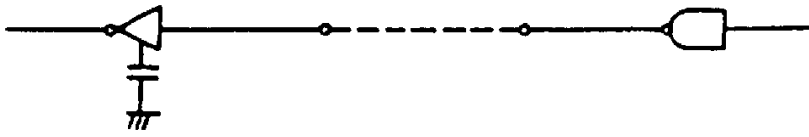
MAX232 or equivalent

Output (DTR,FAULT)
    [Printer side]   [Host side]
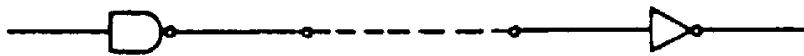
MAX232 or equivalent

DTR   : (-8V) BUSY
          : (+8V) READY

FAULT   : (-8V) Normal
          : (+8V) Abnormal

5-4 Data Composition
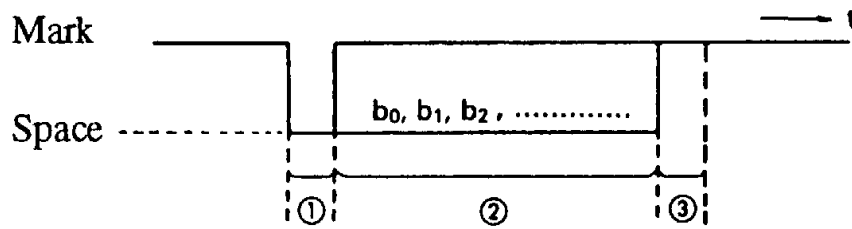

```
1   Start bit
2   Data bits (and parity bit)
3   Stop bit (1 bit more)
```

1) Start bit

1/2 bit past the line dropping from MARK to SPACE, a status reading is taken again. If the reading is SPACE, a start bit is recognized.

2) Data bits and Parity bit

Data bit and Parity bit are checked out every bit form the half point of start bit.
Signal level of these points (Mark = 1, Space = 0) are read as input data.
The sequence of these bit is Bit 0, Bit 1 ~ Parity bit from Start bit.

3) Stop bit

The stop bit consists of one or more bits at "mark" level. When "space" level is detected for a stop bit, a framing error occurs.

5-5 Error Detection

The printer detects Parity, Framing and Overrun Error.
When any error is detected, the data is printed out as (7FH).

Framing Error;

Framing error occurs when SPACE signal is checked out at STOP BIT and the printer print out (7FH).

Parity Error;

Parity check is carried out only when user designates it on the printer pre-setting.

Input Control and Buffering; (over-run-error)
The printer is designed to output DTR signals for each word. If the host computer neglects DTR signal and transmits the data, it may cause the "OVER-RUN ERROR".
In order to avoid such case, set up the host computer to observe DTR signals from the printer by following the connector pin assignments described in 5-2.

Other errors
When an error is detected at the printer mechanism, SEL / ALARM light is flickered.
FAULT signal becomes SPACE states, DTR signal becomes BUSY status. Then printer becomes OFF LINE.

After the error is corrected, SEL / ALARM light becomes off by pushing SEL switch.
The reception of data is resumed when SEL switch is pushed again.

6. Parallel Interface

6-1 Specifications

1) Data Input System   : 8 bit parallel (Data 1-8)
2) Control Signal   : ACK, BUSY, STB, FAULT, RESET(OPTION)
3) Compatible Connector   : Printer side, Equivalent to AMPHENOL 57-40360
                               : Cable side. Equivalent to AMPHENOL 57-30360

6-2 Connector Pin Assignment

Pin No.	Signal Name	Pin No.	Signal Name
1	STB	19	Twisted Pair 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	ACK	28	"
11	BUSY	29	"
12	GND	30	
13	+5V Level	31	RESET (OPTION)
14	GND	32	FAULT
15	GND	33	
16	GND	34	
17	Frame GND	35	
18		36	

6-3 Description of Input / Output Signals

1. Input / Output Signals

Input Signals (To Printer)
DATA 1 : 8 bit signal (Positive logic)
DATA 2 : 8 bit signal (Positive logic)
DATA 3 : 8 bit signal (Positive logic)
DATA 4 : 8 bit signal (Positive logic)
DATA 5 : 8 bit signal (Positive logic)
DATA 6 : 8 bit signal (Positive logic)
DATA 7 : 8 bit signal (Positive logic)
DATA 8 : 8 bit signal (Positive logic)
STB   : A strobe signal for reading in 8 bit data. (Negative logic)
RESET : RESET signal. (Negative logic)

Output Signals (From Printer)
ACK   : This is pulse signal for requesting 8 bit data, issued at the end of a BUSY signal. (Negative logic)

BUSY   : This signal indicated that your printer is in a BUSY state. New data should be input when this
         signal is "LOW". (Positive logic)

FAULT : When your printer is in an alarm state, this signal is "LOW". At this time, all control circuit of
         your printer are interrupted. (Negative logic)

6-4 Electrical Characteristics

1　Input Signal Level
　　All input signals are TTL level.
　　"HIGH" Level ＝ 2.0V Min.
　　"LOW" Level ＝ 0.8V Max.

2　Output Signal Level
　　"HIGH" Level ＝ 2.4V Min.
　　"LOW" Level ＝ 0.4V Max.

3　Input / Output Conditions
　　All of the input signals are pulled up by 3.3K ohms.

　[Printer Side]　　　　　　　　　　　　[Host Side]

Twisted Pair Line

74LS373 or equivalent
(7406 or equivalent only for RESET)

Twisted Pair Line

　7406 or equivalent

6-5 Timing Chart

Data Input and Print Timing
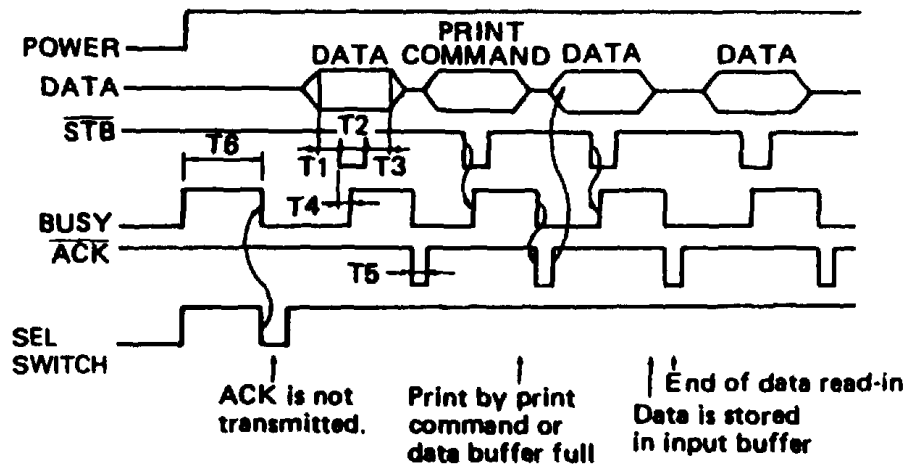
T1 ……… 0.5 μs Min.   T2 ……… 0.5 μs Min.   T3 ……… 0.5 μs Min.
T4 ……… 270ns Max.   T5 ……… 5.5 μs Typ.
T6 ……… 500ms Min. (When power switch is turned on)

7. Dip-Switch Setting

7-1 Dip-Switch (DS-1) Setting

No.	Function	ON	OFF	Factory Setting
1	to chose SEL / DSEL State (when powered on)	SELECT	DESELECT	OFF
2	to chose CR code functions	CR + LF	CR only	OFF
3	to chose Character Table	(Japanese)	International	OFF
4	to chose Character	- see the table below -		OFF
5	Table by the Country			OFF
6	to chose output signal for external device	Paper Winder	Cash Drawer	OFF
7	- not used -			OFF
8	- not used -			OFF

No.	U.S.A.	FRANCE	GERMANY	ENGLAND
4	OFF	ON	OFF	ON
5	OFF	OFF	ON	ON

7-2 Dip-Switch (DS-2) Setting
(only for Serial Interface)

No.	Functions	ON	OFF	Factory Setting
1	to chose Word's Length	7 bit	8 bit	OFF
2	Parity Checking	No	Yes	ON
3	Parity Checking	Even	Odd	OFF
4	Baud rate	- see the table below -		OFF
5	Setting			ON
6	On-Line Mode *1	DC3 LF code	DC3 DESELECT code	OFF
7	- not used -			OFF
8	- not used -			OFF

Baud rate Selection

No.	1200	2400	4800	9600
4	OFF	ON	OFF	ON
5	OFF	OFF	ON	ON

*1
Your iDP3535 Dot Matrix Printer (Serial Interface model only) has been upgraded to provide you with
a new feature is called 'OLMODE' or ON - Line Mode. In this mode, the SEL (select) switch on
the operator panel is not used and the printer is always in the 'SEL' (selected) or ON – Line Mode.
Also, the LF (linefeed) switch on the operator panel will function while the printer is this mode,
even when the printer is in the 'SEL' (selected) Mode.
This feature is activated by placing the Dip Switch DS-2, Number 6 in the 'ON' position.

7-3 Dip-Switch Location

Power off and remove the printer cover before setting the Dip-Switches.
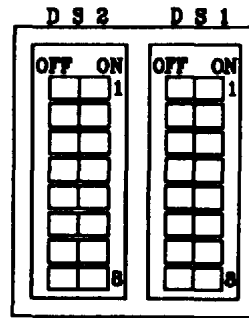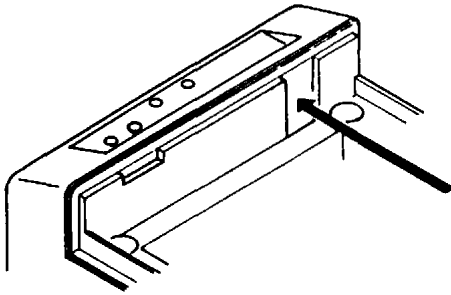
7-4 Usage of the connectors (for cash drawers and paper winder)
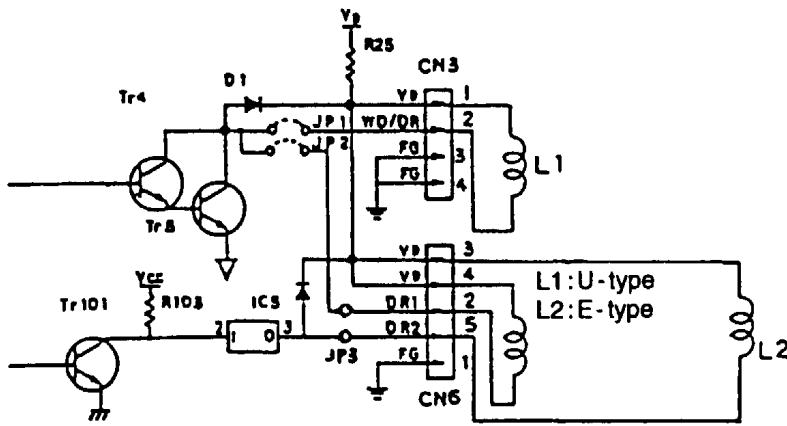
L1: external device 1
L2: external device 2

CN3 : connector for cash drawer and paper winder.

PIN	SIGNAL	FUNCTIONS
1	Vp	DC24V, 0.8A Max
2	DR 1	External device 1
3	FG	Frame GND
4	FG	

connector
Printer side : 5045-04A (molex)
Cable side : 5209-04 (molex)

CN6 : connector for cash drawers.

PIN	SIGNAL	FUNCTIONS
1	FG	Frame GND
2	DR 1	External device 1
3	Vp	DC 24V
4	Vp	DC 24V
5	DR 2	External device 2
6	NC	Not connected

connector
Printer side : 285D-9660J-101 (DDK)
Cable side : 285D-1660P (DDK)

Usage of the DIP switch

Type	Preset JP. Line			Dig SW.	Paper	Cash	Connector	Command
	JP 1	JP 2	JP 3	DIP 1-6	Winder	Drawer	(PIN)	Code (HEX)
E type	ON	OFF	ON	ON	L1(AW-3)	-	CN 3-2	LF (0A)
						L2	CN 6-2.5	SUB (1A)
				OFF		L1	CN 3-2	BELL (07)
						L2	CN 6-2.5	SUB (1A)
U-type	ON	ON	OFF	ON	L1(AW-3)	-	CN 3-2*1	LF (0A)
							CN 6-2	
						L2	CN 6-5	SUB (1A)
				OFF		L1	CN 3-2*1	BELL (07)
					-		CN 6-2	
						L2	CN 6-5	SUB (1A)

*1. Do not connect External Device L1 (Drawer and Winder) to the connectors CN3-2 and CN6-2
at the same time.
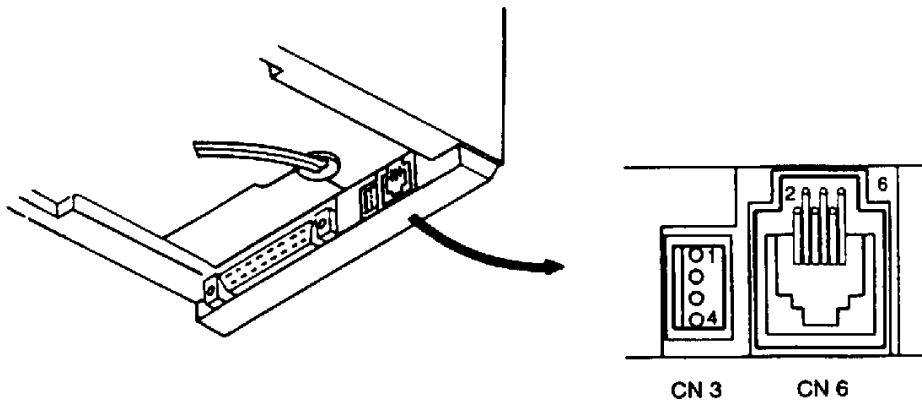
Note :   1) External device 1 and 2 can not be driven at the same time. In case the device is driven continuously,
          the duty note should be less than 20%.
          2) The resistance of L1, L2 should be more than 36 Ω.
          3) Paper winder (AW-3) and cash drawer are option.

For U-type only (USA type)

Your iDP3535 is equipped to drive up to 2 external device – Paper Winder and / or Cash Drawers.
The 4 pin molex connector and the first driver of the modular connector (pins 2 & 3) are shared by the same driver and only one device can be connected to this driver. Acceptable combinations of configurations are:

A) No external devices connected.
B) One Cash Drawer connected to 4-pin molex connector. Set DIPI-6 OFF.
C) One Paper Winder connected to 4-pin molex connector. Set DIPI-6 ON.
D) One Cash Drawer connected to Modular Connector Drive 1 [pins 2 & 3].
   Set DIPI-6 OFF. (Note that the 4-pin molex connector cannot be used.)
E) Two Cash Drawers connected – Drawer 1 connected to 4-pin molex connector – Drawer 2 connected to
   Modular connector Drive 2 [pins 4 & 5]. Set DIPI-6 OFF. (Note that the Modular Connector Drive 1
     [pins 2 & 3] can not be used.)
F) Two Cash Drawers connected – Drawer 1 connected to Modular connector Drive 1 [pins 2 & 3].
   Drawer 2 connected to Modular connector Drive 2 [pins 4 & 5]. Set DIPI-6 OFF.
   (Note that the 4-pin Molex Connector cannot be used.)
G) One Cash Drawer and One Paper Winder connected. Paper Winder connected to 4-pin molex connector
   Drawer 2 connected to Modular connected Drive 2 [pins 4 & 5]. Set DIPI-6 ON.
  (Note that the Modular Connector Drive 1 [pins 2 & 3] cannot be used.)

8. Print Control Functions

8-1 SI & SO Code

Symbol	Code (Hex.)	8 bit data	7 bit data
SI	0F	Standard character designation (Same as US)	Designation of SI side character
SO	0E	Double-width character designation (Same as RS)	Designation of SO side character

8-2 Function Code

Symbol	Code (Hex.)	Function
LF	0A	Feeds a new line after printing.
CR	0D	Feeds a new line after printing. You can select CR function in accordance with your computer's output. For details, refer to 7. Function select by Dip-switches.
RS	1E	Enhanced character designation. The designation is released with US code or line feed.
US	1F	Standard character designation.
FF	0C	Carries out from feed performance after printing.
DC 1	11	Makes the printer SELECT (ON LINE) state. Only this code can be accepted irrespective of DESELECT (OFF LINE) state.
DC 2	12	Red printing is specified / released. Designation / release (alternative) of red one line printing is possible with this code.
DC 3	13	Makes the printer DESELECT (OFF LINE) state.
CAN	18	Clears the print data in the buffer. All the previous input data is cleared with this code.
ESC + "C"	1B, 43	Page length designation and paging action. Ref.to 8-3 (4).
ESC + "0"	1B, 4F	Paging is off.
BEL	7	Control command for cash drawer 1 Ref.to 8-3 (7).
SUB	1A	Control command for cash drawer 2 Ref.to 8-3 (8).

8-3 Input Data Formats

The data input to the printer is made by the codes listed in the Character Code Table.
(1) Standard Character Print Mode Designation.

US (1F)	DATA	LF (0A)

The printer goes automatically to the standard character mode immediately after power-on initialization
or line feed. Therefore, US code can be omitted. In addition, an automatic line feed is carried out after
inputting the data for one line (Full Buffer Print).
The same function as US code is performed by using SI code (except for serial 7 bit data use).

(2) Double-Width Character Print Mode Designation

RS (1E)	DATA	LF (0A)

All print data following RS code are printed out in double-width size and this code can be released by US code.
It is possible to mix the characters in normal width and double width on one line. However,
because a double-width character requires twice the normal width, take care not to exceed the column capacity
of the printer. When the input data become full to fill one line, the Full Buffer Print and one line feed
will be automatically carried out.
RS code will be automatically cancelled after each line feed. The same function as RS is performed by SO code
(except for serial 7 bit data use).

(3) Red Color Print Mode Designation

DC (12)	DATA	LF (0A)

All print data including DC2 are printed in red color and it's not possible to mix the black and red color
characters on one line. This command will be automatically canceled after the line feed.
If DC2 commands are used 2 times on the same line by error, the printer will print out all characters
in black color.

(4) Paging Designation and Page Length Designation

ESC (1B)	C (43)	n

Input ESC + "C" (1B 43) at the top of the line and next input n, which are integers.
With this code, the length (number of lines) per page can be set, and paging action is started,
and the space of three lines are left at the both top and bottom of the page, n should be;$14 \leq n \leq 120$

Otherwise, it will be 66. The paging can be released by ESC + "0" (1B,4F).

(5) Form Feed

> FF(0C)

With this code, paper feed goes on. If there is data in the buffer when this code is input, the printer does from feed printing. The top of form for the next page is made in accordance with the page length which was specified with ESC + "C" + "n".
Top of position of the page is determined when power is turned on or when page length is specified with ESC + "C" + "n".

(6) Canceling

> CAN(12)

All the data in one line prior to CAN are cleared entirely with this code.

(7) Cash drawer control

> BEL(07)

Command to drive the drawer port 1 for 0.2 second period.
DIP switch DS-1 is selected for drawer.

(8) Drawer 2 control

> SUB(1A)

With this code, the drawer port 2 is driven for 0.2 second period.
The drawer command can be set at any place in one line. In case the data are stored in the print buffer when the command is recognized, the command is executed after the contents of the buffer are printed.
In case the data are not stored in the buffer, the command is executed immediately.

9. Initial Setting

Following are automatically set after Power-on.
(1) Printer head returns to its start position.
(2) SELECT (ON-LINE) or DESELECT (OFF-LINE) status may be chosen by the Dip Switches for Pre-Setting.
(3) Print buffer is cleared.
(4) Standard character mode is set.
(5) 66 lines per page is set.
(6) The first line set at the present line.
(7) Designation of Red printing is cleared.
(8) For 7 bit data, character code SI is applied.

10. Maintenance

10-1 Maintenance Procedures
It is recommended that users perform periodic cleaning of their printer.

(1) Exterior

The exterior case of the printer can be cleaned with alcohol. Care should be taken to keep water from reaching the electronic parts and the printing mechanism.

(2) Interior

There is no particular requirement, however, when the printer case is opened to change settings etc.,
dust and other foreign matter may be removed from the printer mechanism and circuit boards with a soft brush.
Special care should be taken to avoid damage to electronic parts and wiring. Furthermore, be sure to disconnect the power plug from the electric outlet before opening the printer case.

11. Character Code Table

11-1 International Character Codes

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL		SP	0	@	P	`	p	▬	=	α	ϱ	↑	1	─	▬
1		DC1	!	1	A	·Q	a	q	▬	ŧ	β	σ	↓	2	▐	▮
2		DC2	"	2	B	R	b	r	▬	ⱦ	γ	τ	←	3	¬	┐
3		DC3	#	3	C	S	c	s	▬	ꜱ	δ	υ	→	4	┘	▲
4			$	4	D	T	d	t	▪	◢	ε	ø	±	5	┌	▐
5			%	5	E	U	e	u	■	◤	ζ	χ	≠	6	└	▲
6			&	6	F	V	f	v	■	◥	η	ψ	≥	7	┴	▲
7	BEL		'	7	G	W	g	w	■	◣	θ	ς	≤	8	┥	▮
8		CAN	(	8	H	X	h	x	▮	♠	ι	Δ	≈	9	┝	▮
9			)	9	I	Y	i	y	▮	♦	ϰ	Γ	•	(	┬	▼
A	LF	SUB	*	:	J	Z	j	z	▮	◆	λ	Σ	●	)	+	✚
B		ESC	+	;	K	[	k	{	▮	♣	μ	Λ	∞	+	+	▼
C	FF		,	<	L	\	l	¦	■	●	ν	Ω	∴	−	┴	✚
D	CR		−	=	M	]	m	}	▮	○	ξ	¢	½	·	┤	✚
E	SO	RS	.	>	N	^	n	~	■	╱	ο	↵	¼	•	┝	✚
F	SI	US	/	?	O	_	o	✻	+	╲	π	▬	0	/	┬	✚

11-2 Individual Country Character Codes

	U.S.A.	England	France	Germany
23H	#	£	#	#
40H	@	@	à	§
5BH	[	[	°	Ä
5CH	＼	＼	Ç	Ö
5DH	]	]	§	Ü
7BH	{	{	é	ä
7CH	¦	¦	ù	ö
7DH	}	}	è	ü
7EH	~	~	¨	ß

12. External Dimensions