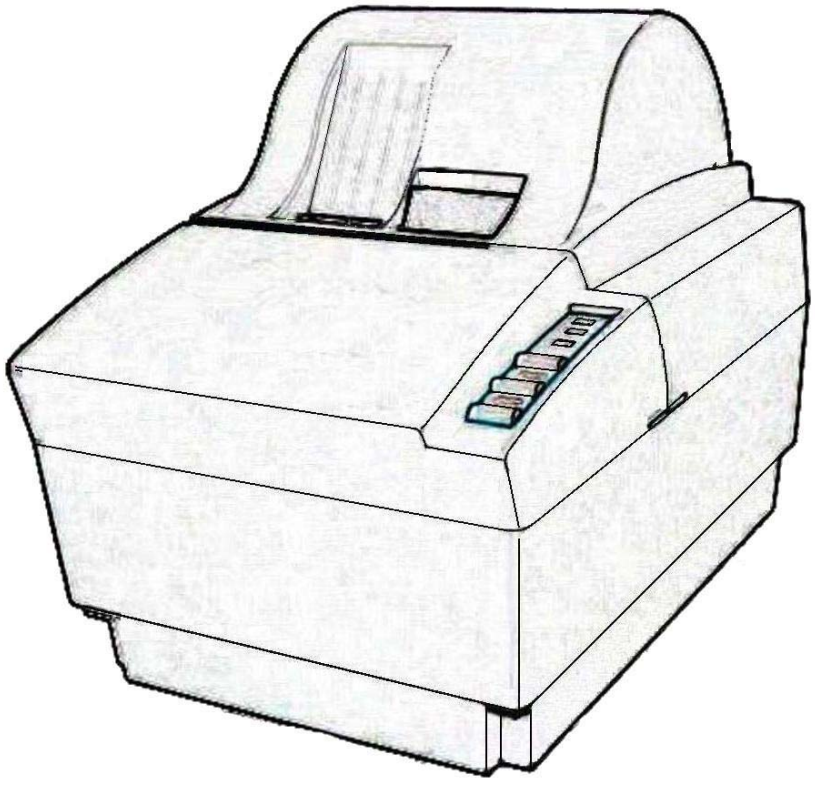
User's Manual

2.1 Station Impact Dot Matrix Printer

MODEL: WP-520E

VERSION : 1.01



CONTENTS

1. GENERAL DESCRIPTION

The WP-520 is a high-speed 2 stations 9-pin impact printer designed for POS terminal, It is a compact, light-weight, and highly reliable printer using plastic mechanical frame.

Features

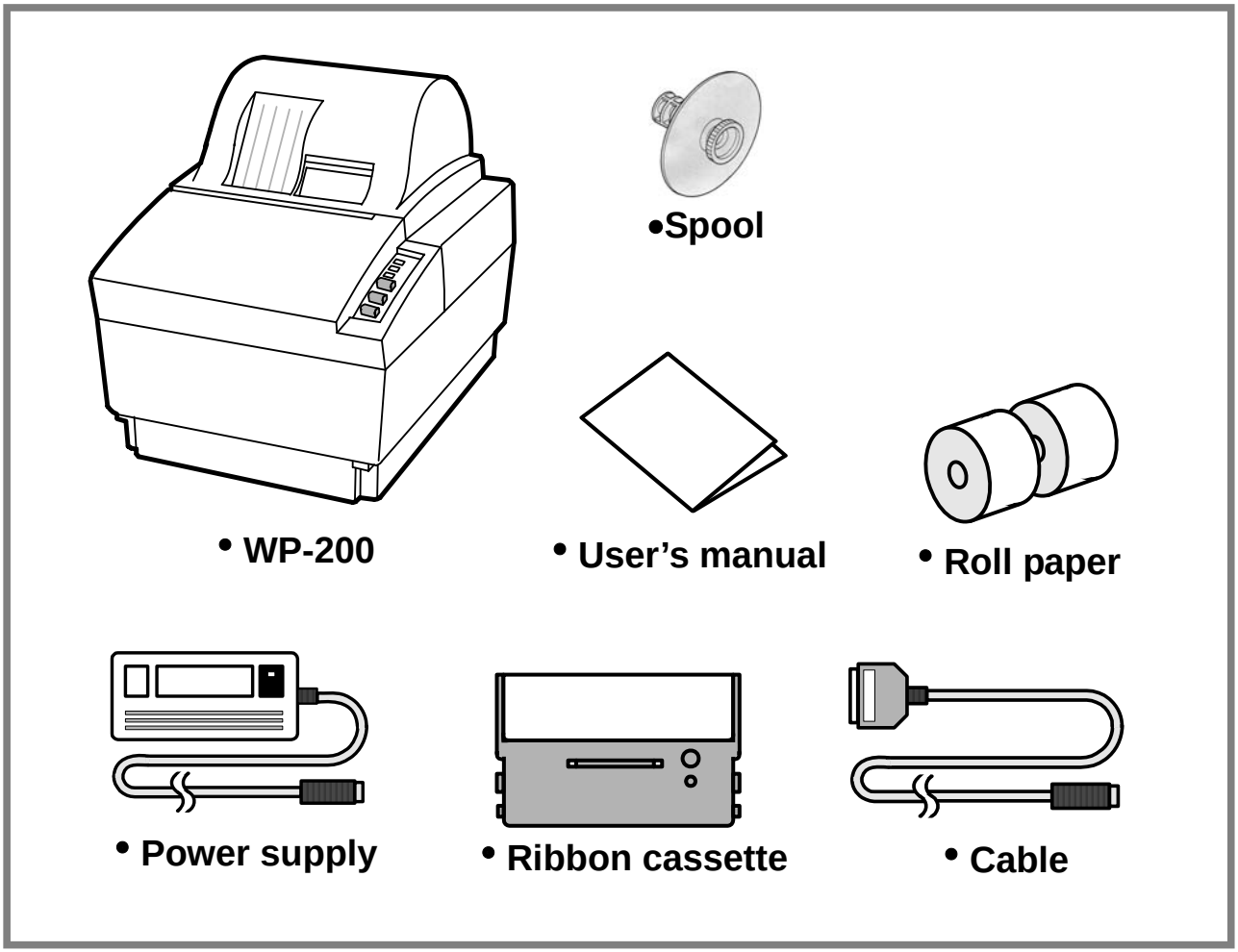
(1) Bi-directional and high-speed printing.
(2) The built-in serial interface conforms to the RS-232C and parallel interface.
(3) Pass through function, easy to link the customer display and printer with same interface.
(4) The resident data buffer has storage capacity of about 8K bytes, enable data to be received even while printing.
(5) Built-in a drawer kick-out interface.
(6) 2.1 Stations printer (receipt, journal and 1 line validation).
(7) Built-in receipt, journal black mark sensor and validation paper detector.
(8) Command protocol based on TP3688/TW or Esc/pos command, adjust by DIP-Switch.

2. MAIN SPECIFICATIONS

Item	Description		
Printing method	Serial impact dot-matrix		
Head wire configuration	9 pin serial configuration		
Printing direction	Bi-directional		
Printing speed	Approx. 3.0 line / second		
Number of character	224 ASCII character		
Number of columns	7x9 font	Receipt	24 columns
		Journal	24 columns
		Validation	55 columns
Character structure	7 x 9 (alphanumeric)		
Paper feed method	Friction method : receipt and journal Independent feed		
Paper feed pitch	4.23 mm (1/6 inch)		
Auto cutter	Full cut (receipt only)		
Fast feed speed	30 lines / second		
Stamp	Detachable Stamp Cassette (logo Stamp should be prepared by the user)		
Detector	Mark detector (receipt x2 and journal x1) Validation detector (journal side only)		
Roll Paper dimensions	Size: Width 44.5 mm ± 0.5 mm Maximum outside dia. :83 mm ± 0.5 mm Thickness: 0.06 ~ 0.09 mm Weight: 52.3 ~ 64.0 g / m²		
Validation paper	135 to 210 mm (width) x 70 mm min.(height).		
Reliability	Mechanism : MCBF 4 million lines Print head life: 100 million character (Approx. 200 million dot / pin)		
Power supply	24Vdc approx.1.5 A (peak 4A).		
Interface	RS-232C and Parallel port		
Drawer kick out	24Vdc		
Working environment	Operation Environment	Temperature: 0 to 50℃; Humidity: 10 to 90%RH; If the temperature is 39℃ above, the humidity is equivalent to 85%.	
	Storage Environment	Temperature: -25 to 70℃; Humidity: 40 ℃ 90%RH for 96 hours.	
External dimensions	200mm(W) x 280.9mm(D) x 230mm(H)		
Weight	Approx. 4kg		

3. UNPACKING THE PRINTER

3.1 Checking the Contents of the Box



Make sure no parts are missing or damaged. If you find any damaged or missing parts, please contact your dealer for assistance.

•Maintenance

Keep the packing case in case you need to transport or store you printer.

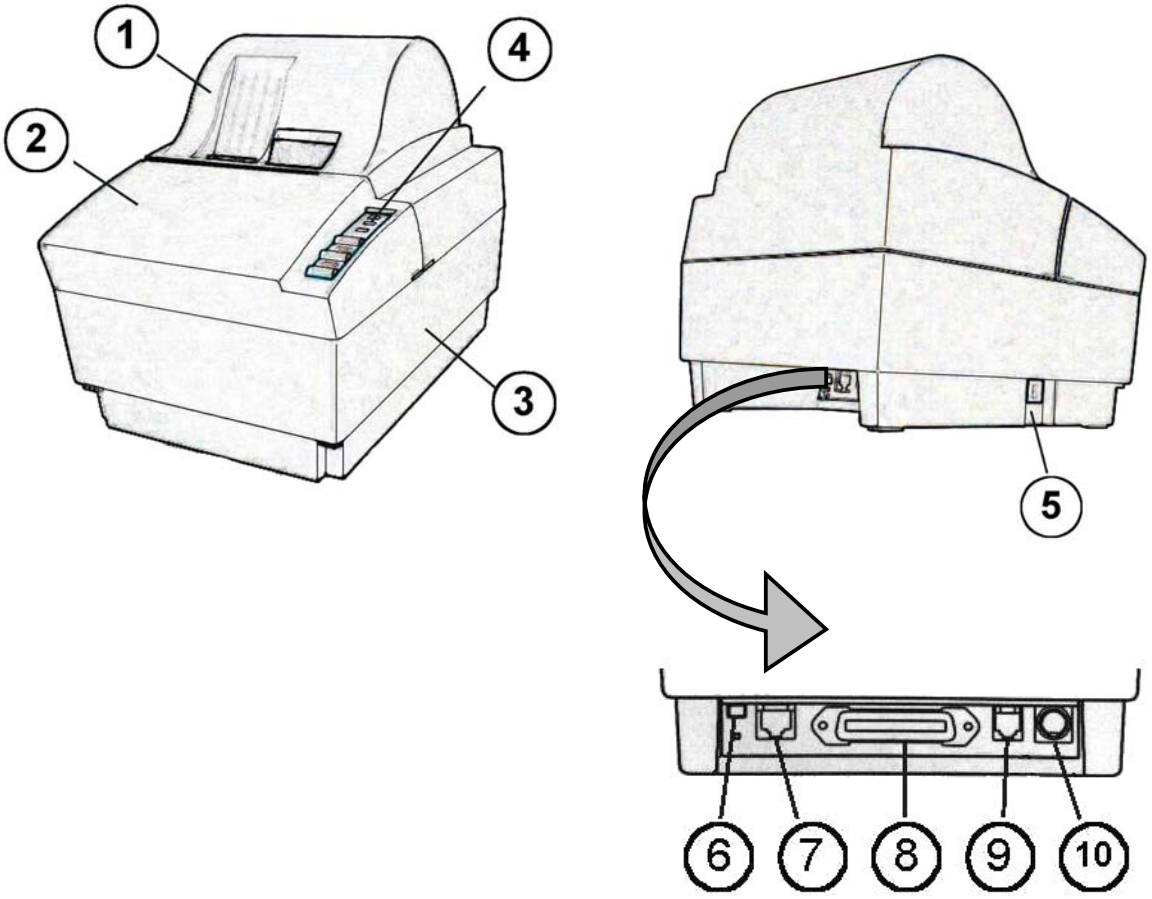
3.2 Choosing a Place for the Printer

- Avoid locations that are subject to direct sunlight or excessive heat (near heater).
- Avoid using or storing the printer in place subject to excessive temperature or moisture.
- Do not use or store the printer in a dusty or dirty location.
- When setting up the printer, choose a stable, horizontal location. Intense vibration or shock may damage the printer.
- Ensure the printer has enough space to be used easily.

3.3 Name and Functions of Parts

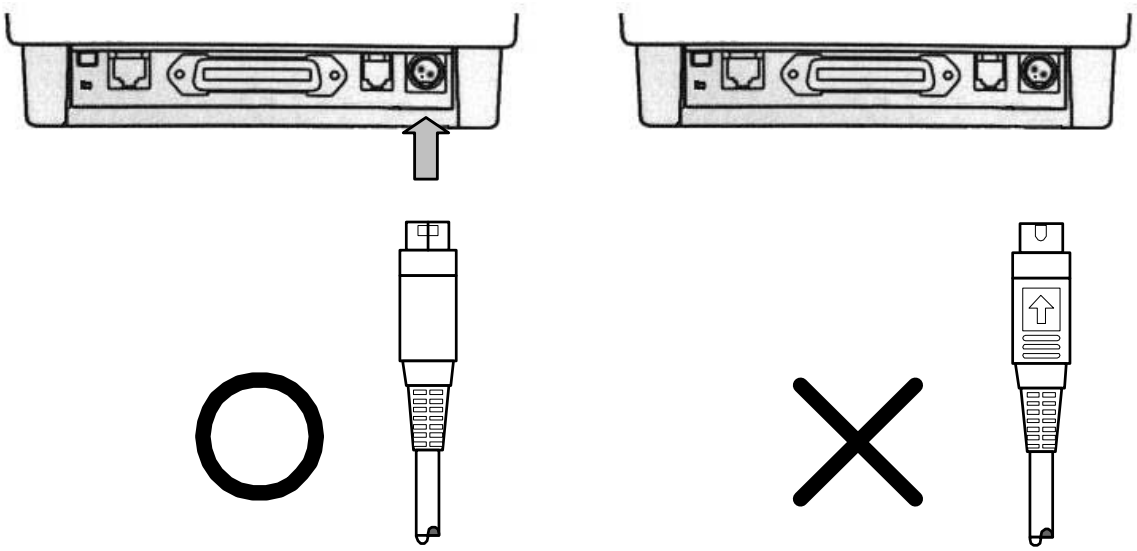
◎**Part names**

1) Take up cover.
2) Printer cover.
3) Lower case.
4) Operation panel.
5) Power switch.
6) Paper near end connector.
7) Serial interface connector.
8) Parallel interface connector.
9) Drawer kick-out connector.
10) Power connector.



4. INSTALLING THE PRINTER

4.1 Connecting the AC Adapter to the Printer



■ **Plugging in AC adapter**

CAUTION:

- Before connecting the printer to the power supply, make sure that the voltage and power specifications match the printer's requirements.
- Using an incorrect power supply can cause serious damage to the printer.

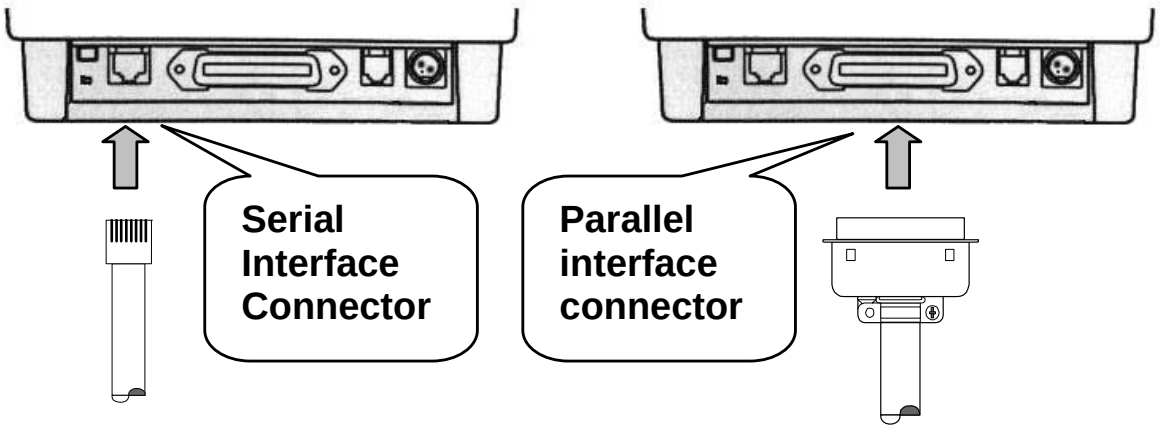
■ **Connect the AC adapter according to the following procedure.**

- Mare sure the printer is turned off.
- Plug the power connector into the printer's power connector without the arrow mark facing upward.
- Plug the power cord into the outlet, and turn on the power.

4.1.1 Connector Specifications

Pin Number	Signal Name
1	+24VDC
2	GND
3	NC
Shell	Frame GND

4.2 Connecting the Host Computer to the Printer



- Choice either serial interface (RS-232C) or parallel interface (Printer port) to connect to your host computer.

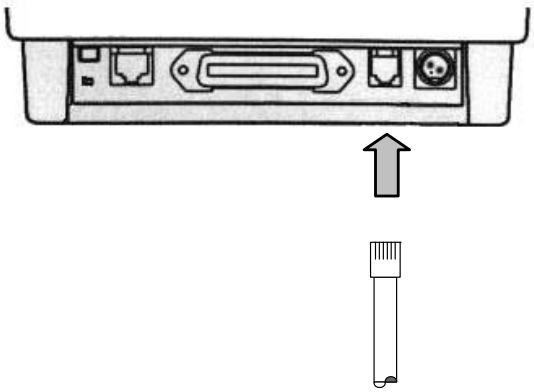
1. If you selected parallel interface, you need an appropriate parallel interface cable to connect your computer to the printer' built-in parallel interface.
2. If you selected serial interface, you can use our serial interface cable (connect type: Phone-Jack 10P8C/M) to connect your computer to the printer's built-in serial interface (connect type: Phone-Jack 10P8C/F).
3. Mark sure that both the printer and computer are turned off; then plug the cable connector securely into the printer's interface connector.
4. Plug the other end of the cable into the computer.

4.3 Connecting the Printer to Your Drawer

Reading this section if you connect a drawer to the printer.

1. Mark sure that the printer is turned off.

2. Plug the cable connector securely into the printer's drawer kick-out connector until you it clicks.



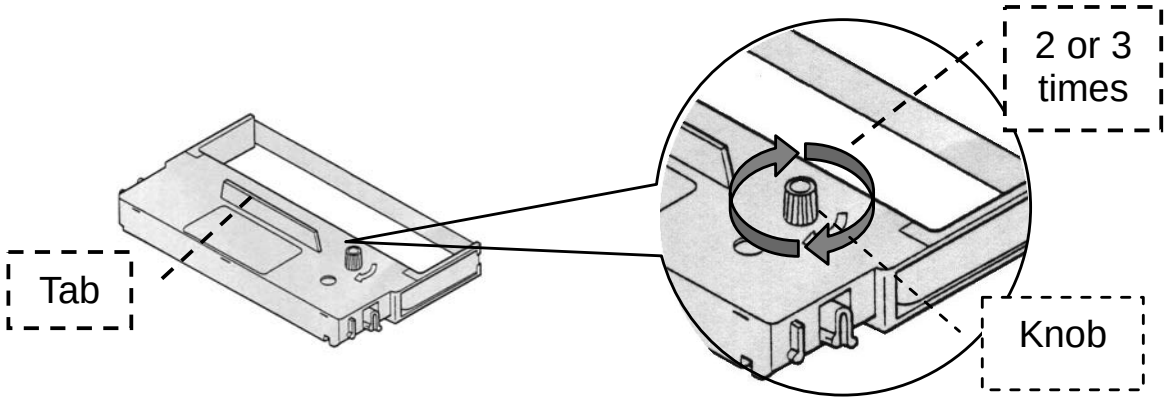
4.4 Installing the Ribbon Cassette

Use CITIZEN ribbon cassette **IR-71(P)** for your printer.

Note:
Never turn the ribbon cassette's feed knob in the opposite direction of the arrow marked on the cassette.

1. Turn on the printer, and open the printer cover.

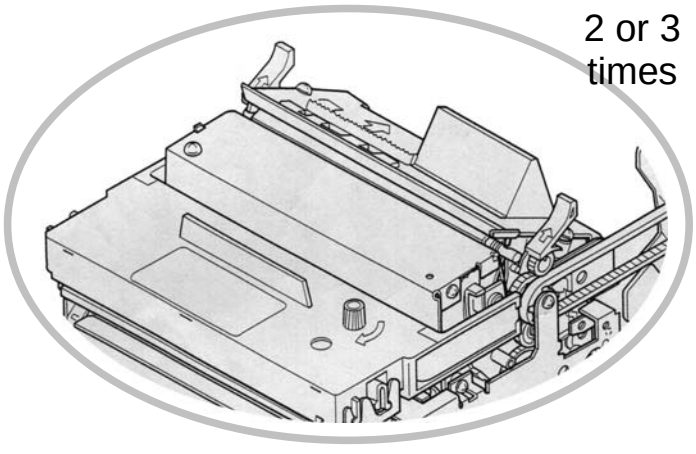
2. Turn the ribbon cassette's knob two or three times in the direction of the arrow, to take up any slack in the ribbon.



3. Insert the ribbon cassette in the printer and rotate the cassette's knob two or three times as show below. This is necessary to place the ribbon in the correct position.

   Mark sure that the ribbon is installed in front of the print head without wrinkles or creases.

   If the ribbon is not installed correctly, remove the cassette as described below and repeat step 2 and step 3 above.



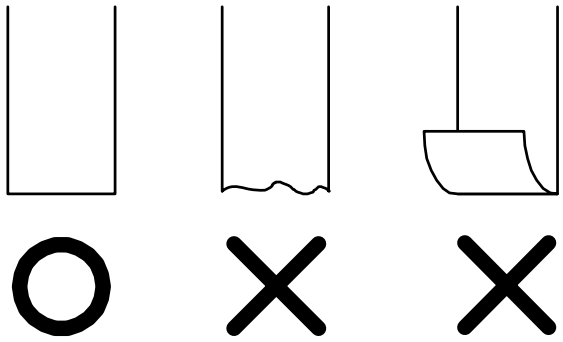
Note:

To remove the ribbon cassette, grasp the ribbon cassette's tab and pull it out of the printer. See the illustration in step 2 above for location of the tab.

4.5 Installing the Roll Paper

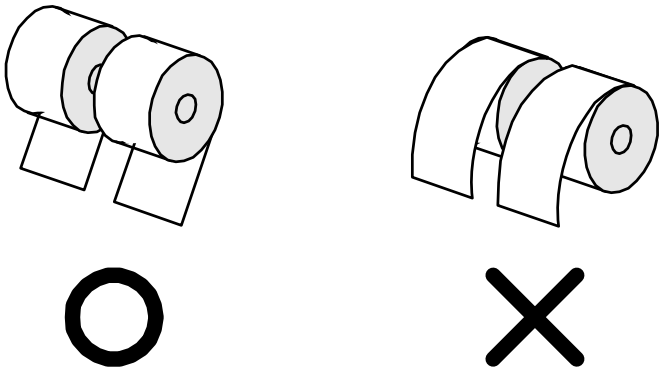
Use paper rolls that match the printer's specifications. See chapter 2 " **MAIN SPECIFICATION** ".

1. Make sure that the edge of the paper is straight, as show in the illustration.



2. Turn on the printer, open the printer cover, and remove the take-up spool.

3. Insert paper rolls in both the receipt and journal sides of the printer as show below.



4. Loading paper methods are prepared 2 types by operating key panel, by manual operation.

  Method by operating key panel.

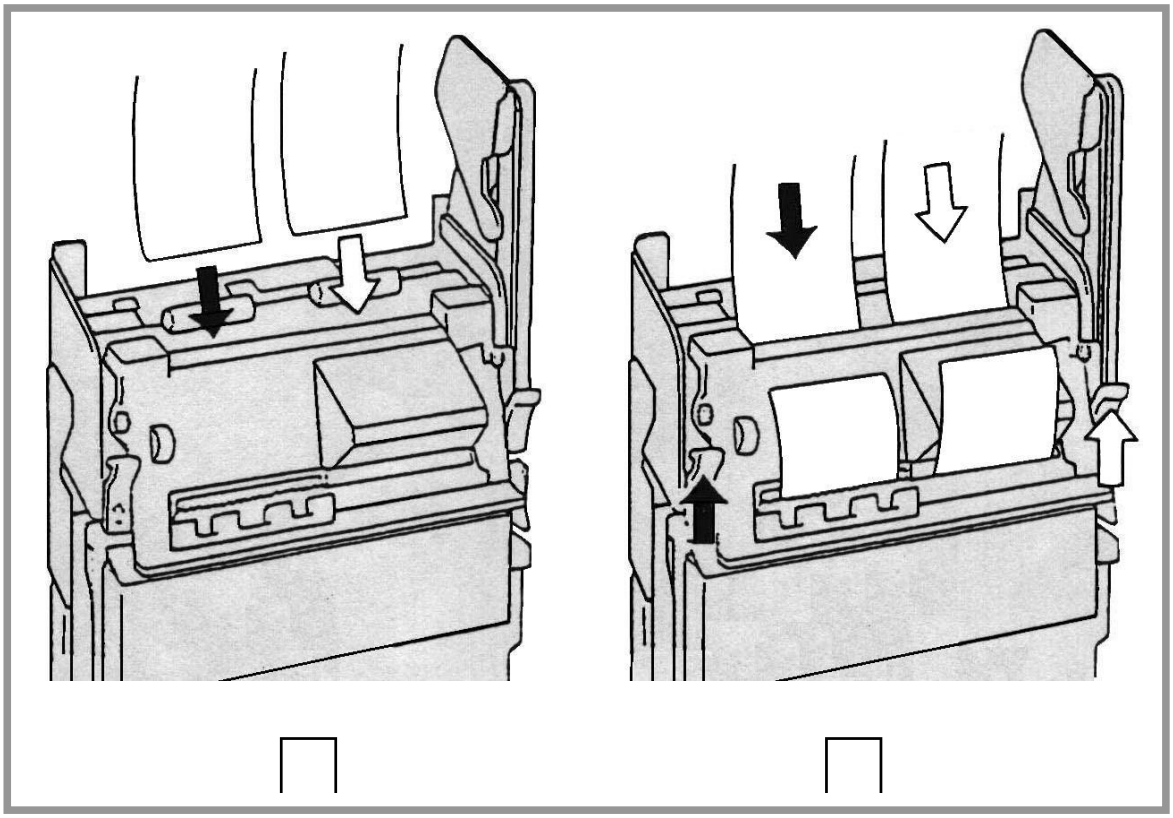
   (1) Insert the paper into the paper entrance while pressing the paper feed switch on the key panel until it reaches the paper feed mechanism.

   (2) After the roll paper is fed, confirm that a decent length of paper has come out of the paper exit on the cover, then stop press the paper feed switch on the key panel.

 Method by manual operation

(1) Insert the roll paper into the paper entrance while pushing lever when the paper comes out from the paper exit on the cover, pull out the roll paper towards the paper feed direction.

(2) Confirm that a decent length of paper has comes out of the paper exit on the cover, then free the finger from the release lever.



5. Opening and closing mechanism of paper feed unit

(1). When opening of the paper feed unit, push release levers on both sides at the same time and lift the paper feed unit.
(2). When closing of the paper feed unit, first it with your hands slowly until release levers locked perfectly.
(3). When opening the paper guide, the spool shaft rises from the groove of the frame and moves toward the interior of the printer. If the spool shaft cannot be placed in the groove after the paper guide is closed, set it manually.
(4). This opening and closing mechanism is useful to remove the jamming paper and load paper at abnormal condition (when paper loading become wrong at height temperature environment or height humidity environment).

5. OPERATION

5.1 Key Panel Description

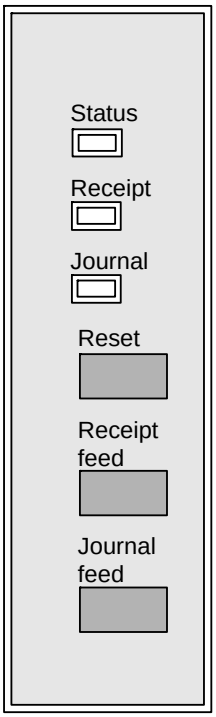


Fig. 3-2
Key panel

(1) Reset key switch

When paper out or has the mechanical error, the printer will be enter the Off line mode, after recover the problem, then press this key, printer will be On line.
When it is held down continuously (for 2.seconds or more), the printer will be stamping one times.

(2) Receipt feed key switch

When this push-button switch is pressed once briefly (for 0.5 seconds or less), the Receipt side paper is fed forward by one line. When it is held down continuously, the paper is fed forward continuously until the switch is released.

(3) Journal feed key switch

When this push-button switch is pressed once briefly (for 0.5 seconds or less), the Journal side paper is fed forward by one line. When it is held down continuously, the paper is fed forward continuously until the switch is released.

(4) Indicator lights

The control panel lights provide information on printer conditions.

Power, on line and Error (Red)

Status	Information	Status	Information
On	Printer ready	Flash	Mechanism error or self-test mode

Receipt status (Yellow)

Status	Information	Status	Information
On	Sense receipt paper mark	Off	Sense receipt paper white

Journal status (Yellow)

Status	Information	Status	Information
On	Sense Journal paper mark	Off	Sense journal paper white

5-2. Switch Operation (Combined Switch operation)

(1) SELF PRINT TEST

JOURNAL FEED + POWER ON (Turn the power on while holding the **JOURNAL FEED** button depressed, the buzzer gives one short beep.)

Self-testing will be performed according to the VER. NO., DIP-switches settings and characters etc., When the **JOURNAL FEED** button is held again after self-printing stopped, the printer will print out.

(2) HEXADECIMAL DUMP MODE

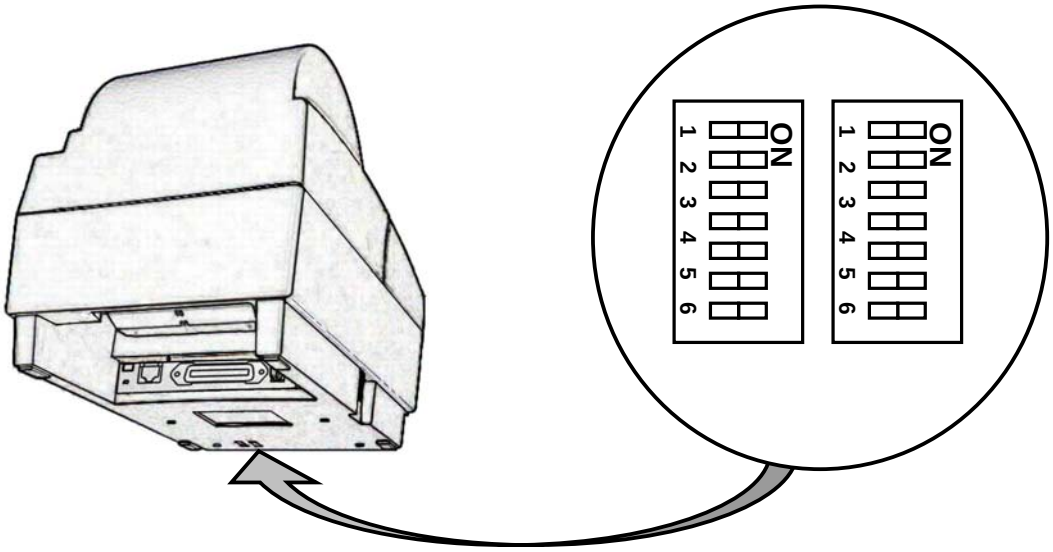
RESET + POWER ON (Turn the power on while holding the **RESET** button depressed, the buzzer gives one short beep.)

Each of the signals sent from the computer to the printer will be printed out in hexadecimal code. This function allows you to check if a control code that sent to the printer by the program being used is correct or not.

After the program has been run, the last line buffer should be flushed by pressing the **RESET** button. To turn off the mode, it is necessary to turn off the printer completely.

6. SETTING THE DIP SWITCHES

The DIP switches are located in the position in the figure below.



Before changing the setting of any DIP-switch, make sure to turn off the power first at the printer.

6.1 Set Baud Rate

DIP1-1	DIP1-2	Baud rate
OFF	OFF	4800 bps.
ON	OFF	9600 bps.
OFF	ON	19200 bps.
ON	ON	38400 bps.

6.2 Set International Character Code

DIP 1-3	DIP 1-4	DIP 1-5	DIP 1-6	Country
OFF	OFF	OFF	OFF	U.S.A
ON	OFF	OFF	OFF	France
OFF	ON	OFF	OFF	Germany
ON	ON	OFF	OFF	Britain
OFF	OFF	ON	OFF	Denmark I
ON	OFF	ON	OFF	Sweden
ON	ON	ON	OFF	Italy
OFF	OFF	OFF	ON	Spain
ON	OFF	OFF	ON	Japan
OFF	ON	OFF	ON	Norway
ON	ON	OFF	ON	Denmark II

6.3 Select Print Head Printing Energies Time

DIP2-1	DIP2-2	Timing
OFF	OFF	330 μs
OFF	ON	350 μs
ON	OFF	370 μs
ON	ON	390 μs

6.4 Select Command Protocol

DIP2-3	Command
OFF	Esc/pos command compatible
ON	TP3688 command set

Note: The DIP2-5, 6 is reserved

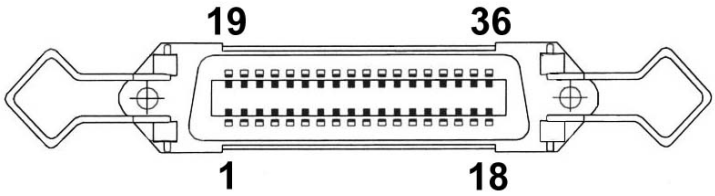
7. PARALLEL INTERFACE

7.1 Specifications

Data input method : 8-bit parallel (DATA 1-8)
Control signal : ACK-,BUSY, STB-, FAULT-, PE, RESET-
Application connectors : Printer side : 57LE-403
: Cable side :

7.2 Connector's Pin Connection

No.	Signal Name	No.	Signal Name
1	STB-	19	TWISTED PAIR GND
2	DATA 1	20	TWISTED PAIR GND
3	DATA 2	21	TWISTED PAIR GND
4	DATA 3	22	TWISTED PAIR GND
5	DATA 4	23	TWISTED PAIR GND
6	DATA 5	24	TWISTED PAIR GND
7	DATA 6	25	TWISTED PAIR GND
8	DATA 7	26	TWISTED PAIR GND
9	DATA 8	27	TWISTED PAIR GND
10	ACK-	28	TWISTED PAIR GND
11	PE	29	TWISTED PAIR GND
12		30	TWISTED PAIR GND
13		31	RESET-
14		32	FAULT-
15		33	GND
16	GND	34	
17	F.G.	35	
18		36	



7.3 Input / Output Signals

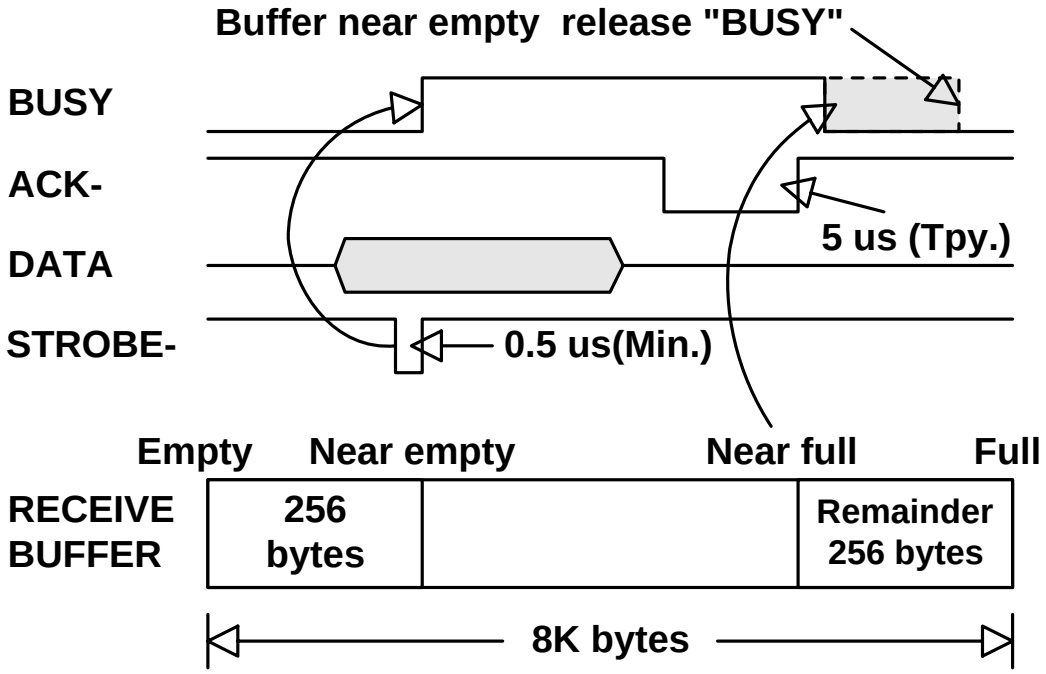
(1) Input signals to the printer

- DATA : This is an 8-bit parallel signal (Positive logic).
- STB- : This is a strobe signal to read in 8-bit data (Negative logic).
- RESET- : This signal resets the entire printer (Negative logic).

(2) Output signals from the printer

- ACK- : This is an 8-bit data request signal. Pulse signal output at the end of the BUSY signal (Negative logic).
- BUSY : This signal indicates the BUSY state of the printer. Enter new data when it is at low. (Positive logic).
- FAULT- : This signal is set to low when the printer has an alarm. When this is done, all control circuits in the printer stop (Negative logic).
- PE : This signal is output when the printing paper has run out or is running out (Positive logic).

7.4 Timing Chart



8. SERIAL INTERFACE

8.1 Specifications

(1) Data Transfer System : Asynchronous

(2) Baud Rate : 4800, 9600, 19200, 38400 bps (Selected by DIP-SW).

(3) Word Length
Start bit : 1 bit
Data bit : 8 bits (Fixed)
Parity bit : No parity (Fixed)
Stop bit : 1 bit or more

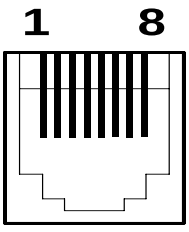
(4) Signal Polarity
RS-232C
- Mark = Logic "1" (-3V to –12V)
- Space = Logic "0" (+3V to +12V)

(5) Receive Data
RS-232C
- Mark = "1"
- Space = "0"

(6) Data Receiving Control (DTR signal)
RS-232C
- Mark = Data transfer not possible
- Space = Data transfer possible

8.2 Connector's Pin Connection

No.	Signal Name	I/O	Signal Name
1	VPP	Output	+24VDC output
2	VPP	Output	
3	GND	-	Signal
4	GND	-	Signal
5	DTR	Output	Printer BUSY signal
6	DSR	Input	Data set ready
7	TXD	Output	Transmit data
8	RXD	Input	Receive data



8.3 Input / Output Signals

(1) RXD

This is a serial receive data signal.

(2) DTR

Write the data or a command when this signal is ready.
If you write while printer is busy, the data can be written into the receive buffer till buffer full.
A BUSY signal is also issued at power-on, during test printing, paper end, buffer near full, or mechanism error.

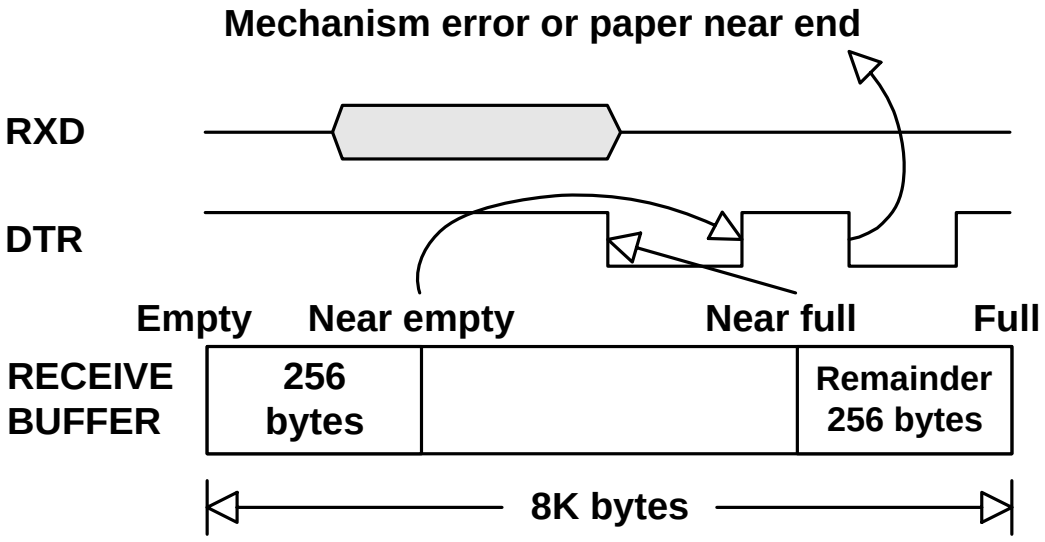
(3) TXD

When transmitting the printer status information, the data will transmit, ignoring DSR.

(4) GND

This is a common ground on the circuit.

8.4 Timing Chart



9. DRAWER KICK CONNECTOR

9.1 Specifications

(1) Data Transfer System

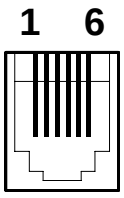
The pulse specified by “ESC p” is output to this connector. The host can confirm the status of the input signal by using the “DLE ENQ, ESC u, GS a (ASB), commands.

(2) Electrical Characteristics

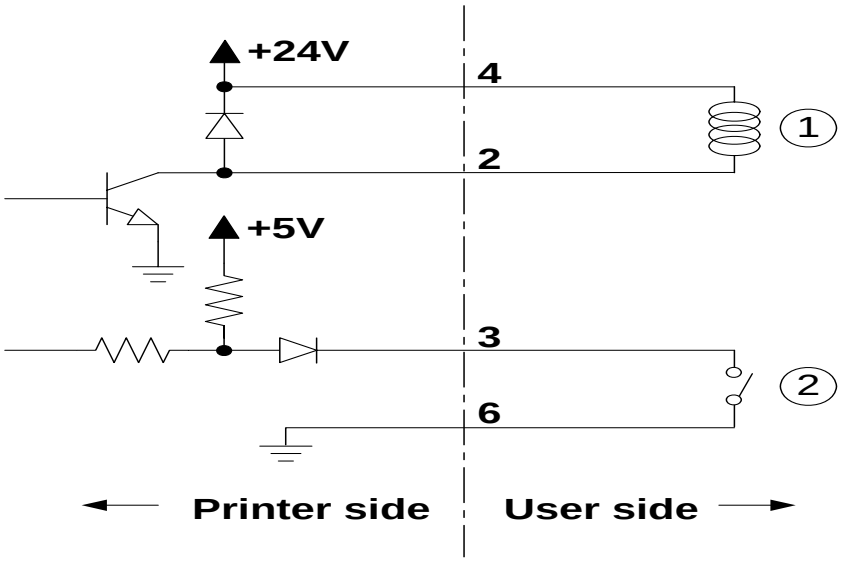
1. Drive voltage : DC 24V
2. Drive current : 0.8A at maximum (Should be within 510 ms)
3. Switch signal : Signal level “L” = 0 to 0.5V
   “H” = 3 to 5V

9.2 Connector’s Pin Connection

No.	Signal Name	I/O
1	Frame GND	-
2	Drawer kick-out drive signal	Output
3	Drawer open/close signal	Input
4	+24V	-
5	NC	Output
6	Signal GND	-



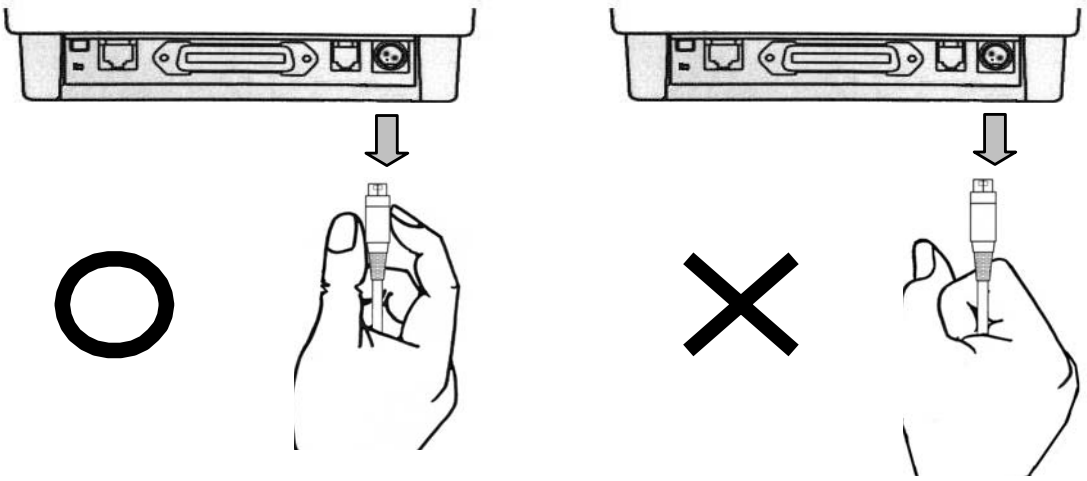
9.3 Drive Circuit



10. Attention Point

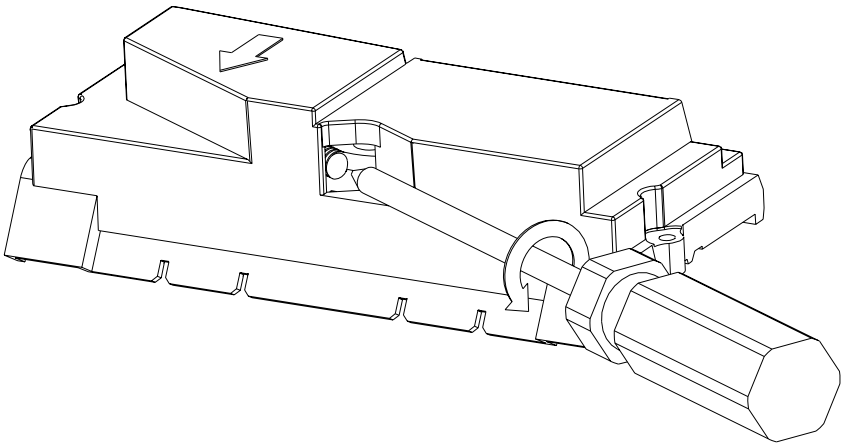
10.1 Attention when extracting power supply plug connection

- When extracting AC adapter, please follow below procedures:
- Confirm that Printer's power supply is in off position。
- When extracting power supply connection, use your finger to press the body of plug connection as picture below.
- If using handshake to extract the plug connection, it will break the clip and cable material.



10.2 Manually withdraw cutter

- When printer is cutting the paper and sudden power failure is happen or paper cutting work unusual make it not available to withdraw cutter automatically, please turn off the power and use cross screwdriver to plug into back terminal of the cutter then manually push back the edge of cutter to push out the cutter (Approximately 20~40 round) until the paper can be pull-out safely.



11. PRINTER CONTROL FUNCTION

11.1 Attached Command Description

The viewpoint of each page

Command

[Name]	Command name.
[Format]	<>H indicates hexadecimal, <> indicates decimal, [ ]k indicates k times repeat to control code and frequency.
[Range]	Gives the allowable range for set argument and data.
[Description]	Explain command function.
[Complement]	Complement particular.
[Note]	Gives important information on the setting and used of printer command, if necessary.

11.2 Esc/pos command list

Make sure the No.3 of DIP-SW2 set to **“OFF”**.

Command	Code	Name and description
FF	<0C>H	Print and eject cut sheet with stamp
LF	<0A>H	Print and line feed
Esc SP	<1B>H<20>H	Set character right-side spacing
Esc !	<1B>H<21>H	Set print mode
Esc @	<1B>H<40>H	Initialize printer
Esc C	<1B>H<43>H	Set paper length with n lines
Esc R	<1B>H<52>H	Select international character set
Esc U	<1B>H<55>H	Designation/cancellation singleness direction print
Esc c 0	<1B>H<63>H<30>H	Select print sheet(s)
Esc z	<1B>H<7A>H	Turn on/off parallel printing mode
Esc d	<1B>H<64>H	Print and feed paper n lines
Esc i	<1B>H<69>H	Execute full cut
Esc o	<1B>H<6F>H	Executes logo stamp printing
Esc p	<1B>H<70>H	Generate pulse
Esc u	<1B>H<74>H	Transmit peripheral device status
DLE EOT	<10>H<04>H	Real-time status transmission
DLE ENQ	<10>H<05>H	Real-time request to printer
GS a	<1D>H<61>H	Set automatic status back (ASB)
GS ENQ	<1D>H<05>H	Real-time transmission of printer status

FF

[Name] Printing, line feed, stamp and full cut .
[Format] <0C>H
[Description] Printing the last data, stamp and feed paper to cut position.

LF

[Name] Print and line feed
[Format] <0A>H
[Description] Prints the data of in the buffer and feed one line of paper.

ESC SP *n*

[Name] Setting of character right spacing.
[Format] <1B>H<20>H<*n*>
[Range] $0 \leqq n \leqq 31$
[Description] Set character right spacing with half dot unit.
N indicates number of dots, add up spacing amount of n dots share to right of character. Therefore the character width become to following table.
Initial value *n*=0

Table: The width (dot) is that character right spacing is set to n dots

Font	Normal	Double width
7x9	9+*n*	(9+*n*) x 2
9x9	11+*n*	(11+*n*) x 2

[Unit: dot]

ESC! *n*

[Name] Set print mode collectively
[Format] <1B>H<21>H<*n*>
[Range] $0 \leqq n \leqq 255$
[Description] Set print mode.
Each bit of n is used as follows.

Bit	7	6	5	4
“1”	Unused	Unused	Double-width	Unused
“0”			Cancellation	
Bit	3	2	1	0
“1”	Unused	Unused	Unused	7X9 font
“0”				9X9 font

ESC @

[Name] Initialize printer
[Format] <1B>H<40>H
[Description] Clears the data in the printer buffer and resets the print mode (Default state).

ESC R *n*

[Name] Selection of international character set.
[Format] <1B>H<52>H<*n*>
[Range] $0 \leqq n \leqq 10$
[Description] Select following country character by value of n.
Initial value *n*=0

n	Character set
0	U.S.A
1	France
2	Germany
3	Britain

n	Character set
4	Denmark I
5	Sweden
6	Italy
7	Spain

n	Character set
8	Japan
9	Norway
10	Denmark II

ESC U *n*

[Name] Designation/cancellation singleness direction print
[Format] <1B>H<55>H<*n*>
[Range] $0 \leqq n \leqq 255$
[Description] Designation or cancel singleness direction print *n* is valid lowest-order bit. *n* as follows:
Bit 0 = 1, Designation singleness direction print
Bit 0 = 0, Cancel singleness direction print
Initial value *n*=0

ESC p m *n1 n2*

[Name] Generate pulse for drawer output
[Format] <1B>H<70>H<m><*n1*><*n2*>
[Range] m=0
$0 \leqq n1 \leqq 255$
$0 \leqq n2 \leqq 255$
[Description] The defined pulse, On time is *n1* X 2msec, Off time is *n2* X 2msec.
[Note] Please don't execute "generate pulse" successively because of it is possible to causes over heat of drawer solenoid. Please use designated standard solenoid.

ESC c 0 *n*

[Name] Select print sheets
[Format] <1B>H<63>H<30>H<*n*>
[Range] $0 \leqq n \leqq 255$
[Description]
- This command is enabled only when input at the beginning of a line.
- Selects the type of sheet to be used for printing.

Each bit of using as follows:

Bit	Off / On	Code	Function
0	Off	0	Journal sheet disabled
	On	1	Journal sheet enabled
1	Off	0	Receipt sheet disabled
	On	1	Receipt sheet enabled
3	Off	0	Validation sheet disabled
	On	1	Validation sheet enabled

Initial value *n*=3
[Note] It is impossible to select Validation sheet and roll paper at the same time, so *n* = 5,6 or 7 are invalid.

ESC d *n*

[Name] Print and feed paper *n* line
[Format] <1B>H<64>H<*n*>
[Range] $0 \leqq n \leqq 255$
[Description] Prints data in the print buffer and execute *n* line feed.
[Note] Please don't execute line feed successively because of it is possible to causes over heat of feed solenoid by line feed of longtime.

ESC i

[Name] Execute full cut
[Format] <1B>H<69>H
[Description] Execute full cut of the receipt side paper

ESC o

[Name] Executes logo stamp
[Format] <1B>H<6F>H
[Description] Executes logo stamp.

DLE EOT *n*

[Name] Real-time status transmission

[Format] <10>H<04>H<*n*>

[Range] $1 \leqq n \leqq 4$

[Description] Transmission the selected printer status specified by n in real time according to the following parameters:

n =1 : Transmit printer status
n =2 : Transmit off-line status
n =3 : Transmit error status
n =4 : Transmit paper roll sensor status

[Note]

- Treat this command in receiving time.
- Transmits 1 byte only without confirm DSR signal when transmits status.
- Executes treatment at status of both on-line and receiving buffer and error.
- Except this command the notice is necessary also because this command is executed when <10>H<04>H<*n*> ($1 \leqq n \leqq 4$) data line is received.
- It is prohibited to squeeze this command to other command rows for using.
- Command is ignored when *n* is exception of range.
- It is necessary to discerns status by this command and ASB status, when ASB is valid by GS a command. Refer the discrimination of transmitting status of attached

n=1 : Printer status

Bit	Function	Value	
		0	1
0,1	Undefined		
2	Status of drawer kick connect pin 3	Low	High
3	Status of On line/Off line	On line	Off line
4,5	Undefined		
6,7	Undefined		

n=2 : Off-line status

Bit	Function	Value	
		0	1
0,1	Undefined		
2	Undefined		
3	Feed paper with feed switch	No feeding	Feeding
4,5	Undefined		
6	Error	No error	Error
7	Undefined		

n=3 : Error status

Bit	Function	Value	
		0	1
0,1	Undefined		
2	Mechanical error	No error	Error
3,4	Undefined		
5,6	Undefined		
7	Out of paper mark error	No error	Error

n=4 : Continuous paper sensor status

Bit	Function	Value	
		0	1
0,1	Undefined		
2	Journal paper roll near-end	Paper present	Paper absent
3	Receipt paper roll near-end	Paper present	Paper absent
4	Validation paper	Paper present	Paper absent
5	Journal paper mark	Mark present	Mark absent
6	Receipt paper mark	Mark present	Mark absent
7	Undefined		

ESC z *n*

[Name] Turn on/off parallel printing mode on receipt and journal

[Format] <1B>H<7A>H<*n*>

[Range] 1≦*n*≦255, Default *n*=1

[Description] Turns parallel printing mode on or off. When parallel printing mode is turned on, the printer prints the same data on both receipt and journal paper.
When *n*=<*******0>B, turns off parallel printing mode.
When *n*=<*******1>B, turns on parallel printing mode.

[Note]
- This command is enabled only when input at the beginning of a line.
- If neither receipt nor journal paper is not selected by "**ESC c 0"** in parallel printing mode, parallel printing is not performed.

DLE ENQ *n*

[Name] Real-time request to printer

[Format] <10>H<05>H<*n*>

[Range] $1 \leqq n \leqq 2$

[Description] Respond to request from host by designation of n.

n=1 : The printer is responded from beginning of error line when returns from error.

n=2 : Print will be returned from error after receiving buffer and printer buffer.

[Note]

- Treat this command in receiving time.
- Executes treatment at status of both on-line and receiving buffer and error.
- This command is valid only for returnable error.
- Except this command the notice is necessary also because this command is executed when <10>H<05>H<*n*> ($1 \leqq n \leqq 2$) data line is received.
- It is prohibited to squeeze this command to other command rows for using.
- Command is ignored when n is exception of range.
- Return from error after contents of receiving buffer, printer buffer is cleared when *n*=2. However, all sorts of set content with ESC ! holds state of at error rising time. So this printing is initialized completely with this command and ESC @.

ESC u *n*

[Name] Transmit peripheral device status

[Format] <1B>H<74>H<*n*>

[Range] *n* = 0,<30>H

[Description] Transmit the current status of connector pin *n*.

[Note] Transmitted status as following table.

Pay attention to in case it takes until status is transmitted, because of this command is executed in time of receiving buffer is deploying.

Bit	Off / On	Code	Function
0	Off	0	Drawer sensor signal is “Low”
	On	1	Drawer sensor is signal is “High
1,2	Off	0	Undefined
3	Off	0	Undefined
4	On	1	Fixed to on.
5	On	1	Fixed to on.
6,7	Off	0	Undefined

GS a *n*

[Name] Valid/invalid of automatic status back (ASB)
[Format] <1D>H<61>H<*n*>
[Range] $0 \leqq n \leqq 255$
[Description] Enable or disable ASB and specifies the status time to include, using *n* as follows:

Bit	Function	0	1
0	Drawer kick-out connects pin 3 status.	Disable	Enable
1	Printer on-line/off-line	Disable	Enable
2	Error status	Disable	Enable
3	Paper roll sensor status	Disable	Enable
4	Undefined		
5	Undefined		
6	Undefined		
7	Undefined		

[Note]
- If *n* = 0, ASB disable.
- ASB is enabled if only one status is selected. The printer automatically transmits a status of four bytes whenever then status changes.
- When transmitting a status, the printer transmits only four bytes without confirming the condition of the DSR signal.
- This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receiver buffer status.
- The status to be transmitted is as follows:

First byte (Printer information)

Bit	Function	Value	
		0	1
0,1	Undefined		
2	Status of drawer kick connect pin 3	Low	High
3	Status of On line/Off line	On line	Off line
4,5	Undefined		
6	Feed paper with feed switch	No feeding	Feeding
7	Undefined		

Second byte (error information)

Bit	Function	Value	
		0	1
0,1	Undefined		
2	Mechanical error	No error	Error
3,4	Undefined		
5,6	Undefined		
7	Out of paper mark error	No error	Error

Third byte (paper sensor information)

Bit	Function	Value	
		0	1
0	Journal paper roll near-end	Paper present	Paper absent
1	Receipt paper roll near-end	Paper present	Paper absent
2	Journal paper mark	Mark present	Mark absent
3	Receipt paper mark	Mark present	Mark absent
4	Validation paper	Paper present	Paper absent
5	Undefined		
6,7	Undefined		

Forth byte (don’t care)

Bit	Function	Value	
		0	1
0,1,2,3	Undefined		
4,5,6,7	Undefined		

GS ENQ

[Name] Real-time transmission of printer status
[Format] <1D>H<05>H
[Description] Transmission printer status when receives command.
[Note]
- Treat this command in receiving time.
- Transmits 1 byte only without confirm DSR signal when transmits status.
- Executes treatment at status of both on-line and receiving buffer and error.
- Except this command the notice is necessary also because this command is executed when <10>H<05>H data line is received.
- It is prohibited to squeeze this command to other command rows for using.
- Command is ignored when n is exception of range.
- It is necessary to discern status by this command and ASB status, when ASB is valid by GS a command. Refer the discrimination of transmitting status of attached

Bit	Function	Value	
		0	1
0	Paper near end detector	Paper present	Paper absent
1			
2	Undefined		
3	Status of On line/Off line	On line	Off line
4	Pin 3 status of drawer kick connector.	Low	High
5	Validation paper	Paper present	Paper absent
6	Error status	No error	Error
7	Both of Journal and receipt paper at mark position	Paper present	Paper absent

11.3 TP-3688 command list

Make sure the No.3 of DIP-SW2 set to **“ON”**.

Command	Code	Name and description
Esc V	<1B>H<56>H	Print and eject cut sheet with stamp and Check black mark for TAIWAN invoice
Esc P	<1B>H<50>H	line feed and Printing
Esc L	<1B>H<4C>H	Line feed
Esc S	<1B>H<53>H	Stamp
Esc C	<1B>H<43>H	Cut
Esc G	<1B>H<47>H	Drawer output
Esc R	<1B>H<52>H	Reset printer
Esc O	<1B>H<4F>H	Real time request to printer

Note: this command also allowed to use the leading code for double “Esc”, For example “Esc Esc S”.

Esc V *s*

[Name] Printing, line feed, stamp and full cut (check black mark) for TAIWAN invoice format.

[Format] <1B>H<56>H

[Range] *s* = “B” : select receipt and journal paper sheet.
s = “R” : select receipt paper sheet.
s = “J” : select journal paper sheet.

[Description] Printing the last data, stamp and feed paper to mark position for cut paper, The flow chart sees as below.

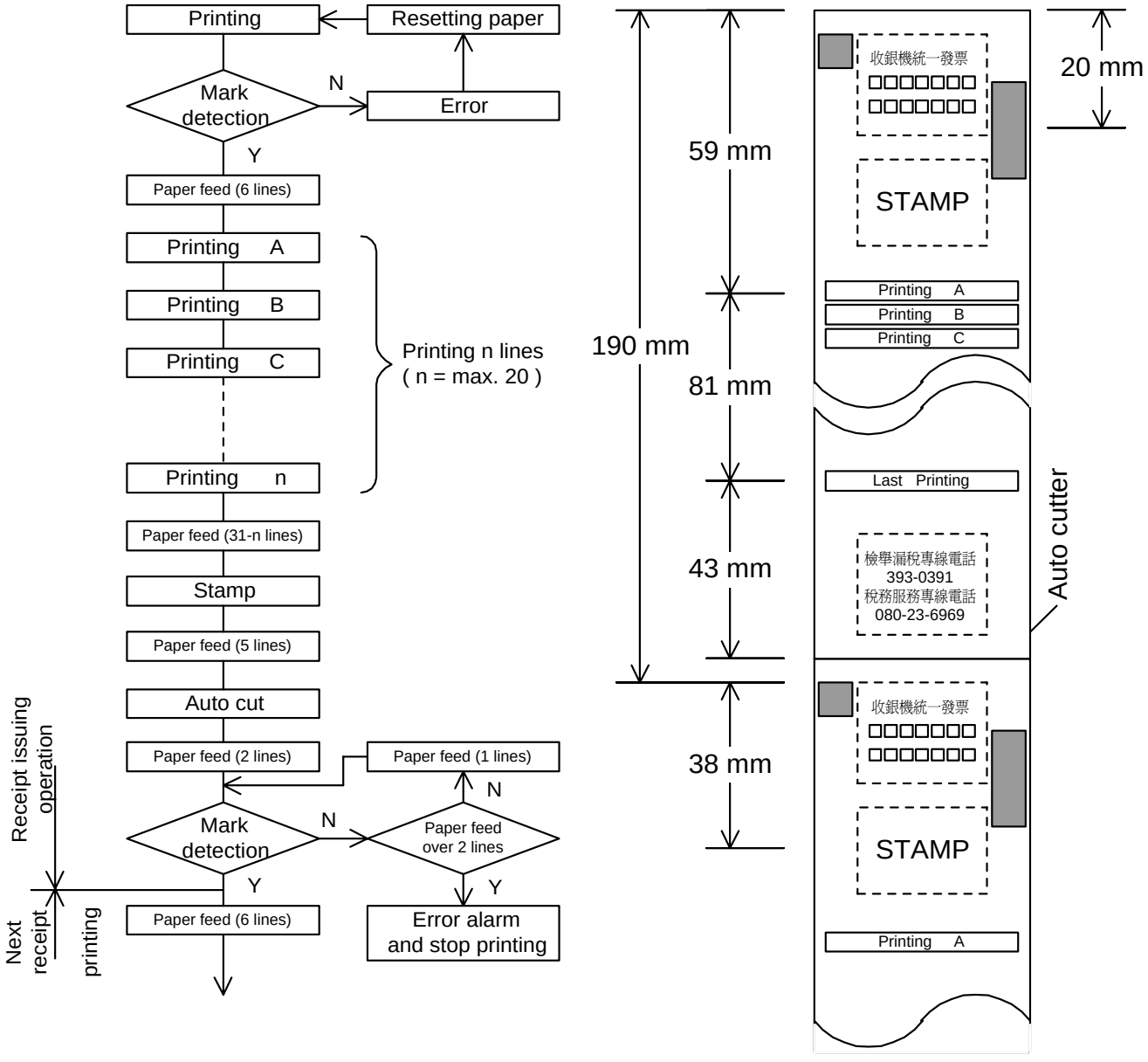


Fig: 4-1 Receipt issuing flow chart and invoice format

Esc P *s n* d_1 ~ d_{24}

[Name] Line feed and printing.
[Format] <1B>H<50>H<*s*><*n*><d_1>….<d_{24}>
[Range] ***s*** : select paper sheet for print
s = "B" : select receipt and journal paper sheet.
s = "R" : select receipt paper sheet.
s = "J" : select journal paper sheet.
s = "V" : select validation paper sheet.

n : line feed counter
0H≦*n*≦01H, 30H≦*n*≦31H

d_n: data string for printing
d_n = <0D>H : print data directly.
d_n = <0A>H : print data directly.
d_n = <0E>H : process double-width character once for next coming data <d_{n+1}>.

[Description]
- Feed the paper *"n"* lines of *"s"* indicator and printing the data string d_1 ~ d_{24}.
- Printer will print out the data string at <d_{25}> automatically.
- When the d_n < 20H and d_n ≠<0D>H,<0A>H or <0E>H, the printer will print space to instead of unrecognized data.

Esc L *s n*

[Name] Line feed.
[Format] <1B>H<4C>H<*s*><*n*>
[Range] ***s*** : select paper sheet for print
s = "B" : select receipt and journal paper sheet.
s = "R" : select receipt paper sheet.
s = "J" : select journal paper sheet.

n : line feed counter
0H≦*n*≦0FH, 30H≦*n*≦3FH

[Description] Feed the paper *"n"* lines of *"s"* indicator.

Esc S

[Name] Stamp
[Format] <1B>H<53>H
[Description] Perform stamp once at receipt paper.

Esc C

[Name] Cut
[Format] <1B>H<43>H
[Description] Perform cut once at receipt paper.

Esc G

[Name] Drawer output
[Format] <1B>H<47>H
[Description] Perform drawer output once for 200ms.

Esc R

[Name] Reset printer
[Format] <1B>H<52>H
[Description] Reset printer from error, clear printer buffer and receive buffer.

Esc O

[Name] Real time request status to printer
[Format] <1B>H<4F>H
[Description] Printer will transmit 11 bytes while even during error states and without confirm DSR from host, the status description as following:
S d_1 d_2 d_3 d_4 d_5 d_6 d_7 d_8 d_9 <CR>

Bytes	Function	Value	
		30H	31H
1	Leading code	"S",<53>H	
2	Receipt paper mark	Mark present	Mark absent
3	Journal paper mark	Mark present	Mark absent
4	Undefined		
5	Validation paper	Paper absent	Paper present
6	Motor lock error	No error	Error
7	During printing	Print stop	Printing
8	Paper mark error	No error	Error
9	Receive buffer full	No full	Full
10	Undefined		
11	Ending code	CR, <0D>H	

APPENDIX A. CHARACTER CODE TABLES

A-1. Chinese Character Codes

	00	10	20	30	40	50	60	70	80	90	A0	B0	C0	D0	E0	F0
0	NUL	DLE	SP	0	@	P	`	p			CHINESE CHARACTERS AREA					
1			!	1	A	Q	a	q								
2			“	2	B	R	b	r								
3			#	3	C	S	c	s								
4	EOT		$	4	D	T	d	t								
5	ENQ		%	5	E	U	e	u								
6			&	6	F	V	f	v								
7			‘	7	G	W	g	w								
8			(	8	H	X	h	x								
9	HT		)	9	I	Y	I	y								
A	LF		*	:	J	Z	j	z								
B		ESC	+	;	K	[	k	{								
C			,	<	L	\	l	|								
D	CR	GS	-	=	M	]	m	}								
E			.	>	N	^	n	~								
F		US	/	?	O	_	o	SP								

A-2. International Character Set

Country	ASCII code												
	Hex	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
	Dec	35	36	64	91	92	93	94	96	123	124	125	126
U.S.A		#	$	@	[	\	]	^	`	{	|	}	~
France		#	$	à	º	ç	§	^	`	é	ù	è	“
Germany		#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
U.K.		£	$	@	[	\	]	^	`	{	|	}	~
Denmark |		#	$	@	Æ	∅	Å	^	`	æ	f	å	~
Sweden		#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy		#	$	@	º	\	é	^	ù	à	ò	è	ì
Spain		Pt	$	@	¡	Ñ	¿	^	`	“	ñ	}	~
Japan		#	$	@	[	¥	]	^	`	{	|	}	~
Norway		#	¤	É	Æ	∅	Å	Ü	é	æ	f	å	ü
Denmark ||		#	$	É	Æ	∅	Å	Ü	é	æ	f	å	ü

APPENDIX B. EXTERNAL DIMENSION