

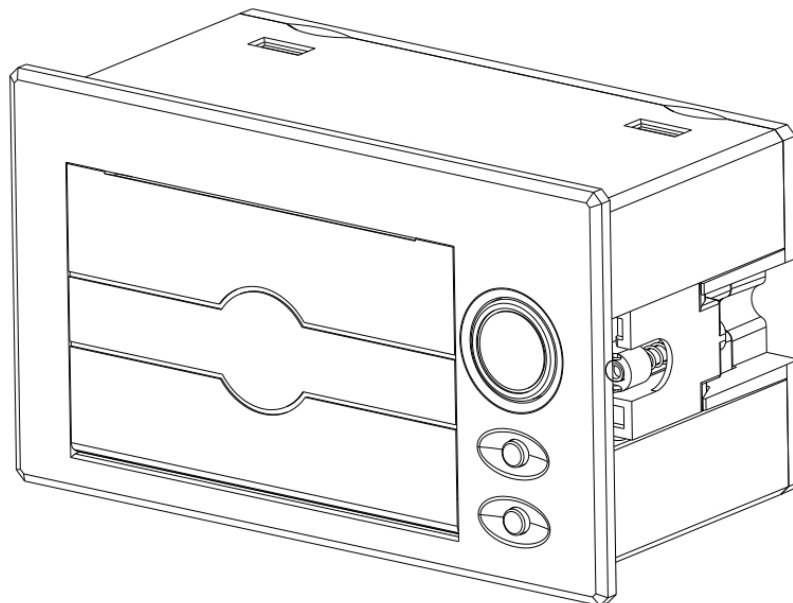
SPRT®

PANEL THERMAL RECEIPT PRINTER

USER MANUAL

SP-RMD9

VER 1.05



Beijing Spirit Technology Development Co., Ltd

www.sprt-printer.com

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Introduction

RMD9 thermal printer is an intelligent dot matrix printer which is developed by Beijing spirit technology development co., LTD., and oriented toward the 21st century's market. The printer itself uses the new imported printing head with single chip computer and has an advantage in small volume, light weight, fully functional, high speed, high-definition, beautiful appearance, simple operation and convenient connection. It is the most ideal matching products for medical equipment, fire control, industrial control, and other various instrumentation.

RMD9 thermal printers has the same character set 1 and set 2 with RMDIII in ANK mode . According to the different Chinese dots under Chinese manner, printer can print 24dots height 12*24 half-width character and 16dots height 8*16 half-width character, as well as a large number of mathematical symbols, special symbols, graphics, curve. Can change through the command to print and character spacing characters, you can customize the size of the part code and the printer has detection function.

RMD9 printer has Windows driver, which is able to print all kinds of characters, Chinese characters and graphics directly with PC machine.

Chapter 1 Characteristic and Specification

1.1 Main characteristic

- ◇ Thermal Printing method.
- ◇ Integrating the printer head and the circuit, easy to install.
- ◇ With single chip processor, and standard parallel interface or serial interface, it is easy to connect with all kinds of microcomputer or intelligent instruments .
- ◇ With Chinese characters, characters, graphics, such as real-time print command, it is compatible between instruction set and the traditional printer.
- ◇ Support for multiple international code page word stock and pre-store bitmap printing.
- ◇ With the detection function, all the code will be printed, high resolution character, nice font.
- ◇ There is enough of the receive buffer---3K.
- ◇ 57.5±0.5mm width thermal printing paper.
- ◇ Power supply:
 - SP-RMD9 P/S/Q H: DC5V~8.5V, Current 3A
 - SP-RMD9 VP/VS/V Q/VUS H: DC9V~24V, Current 3A
- ◇ Operating temperature range: 0~50°C
- ◇ Can be used under DOS and Windows .
- ◇ Resolution:8dots/mm(384dpi).
- ◇ Printing speed :30mm/s.
- ◇ Paper type: 57.5× φ 40mm(MAX)
- ◇ Install size(mm): 103mm×57mm(W×H) depth: 55mm
- ◇ Outline dimension: 110mm×64mm×58mm(W×H×D)

1.2 Printing capability

- ◇ Printing method: Thermal line printing
- ◇ Interface: Parallel interface (Compatible with CENTRONICS) and Serial Interface (RS-232 or TTL) , USB
- ◇ Interface connector: Serial Interface: IDC10 pin socket
Parallel Interface: IDC26 pin socket
USB Interface: Mini-USB socket
- ◇ Control code is general ESC、FS、GS
- ◇ [SEL] button is for self-test and on-line control. SEL light is for error alarm and busy indication, it is off on a normal printing status. Flashing frequency says different meaning, refer to the third chapter 3.2. [LF] is feed

button. LF light is power light. [SEL] and [LF] can be used to modify printer parameters refer to 3.1.3 of chapter 3.

◇Printing Paper: Thermal printing paper

◇Reliability: MCBF (Mean Cycles Between Failure) $(5\sim15) \times 10^6$

◇Operating temperature $0\sim50^{\circ}\text{C}$, relative temperature $0\sim80\%$

◇Storage temperature $-20\sim60^{\circ}\text{C}$, $10\sim90\%$

Chapter 2 Printing Installation

2.1 Outer Appearance

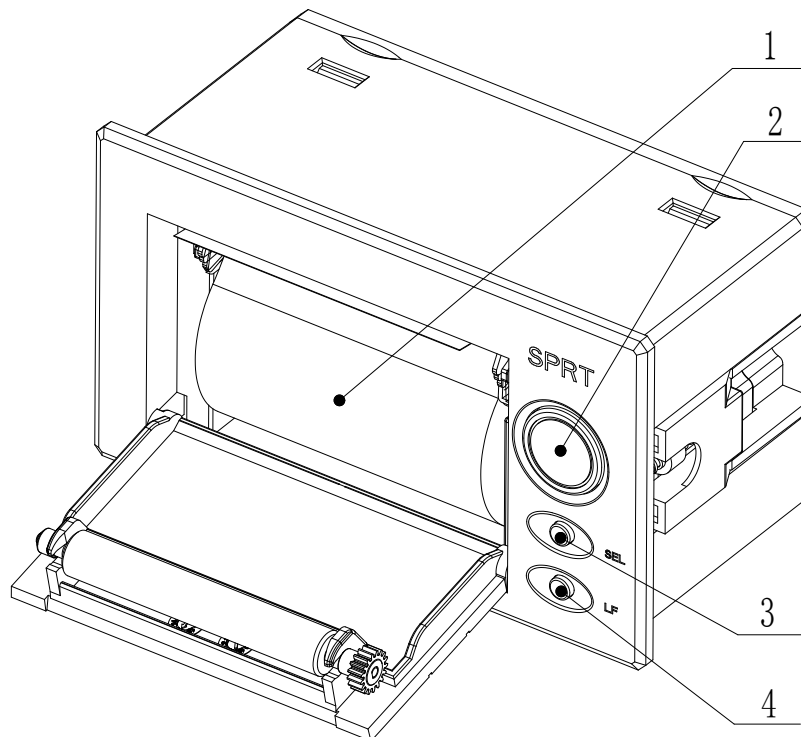


Fig 2-1

1. Paper roll 2. Open Button 3. SEL Button, Error 4. LF Button, Power

2.2 Outline Dimension

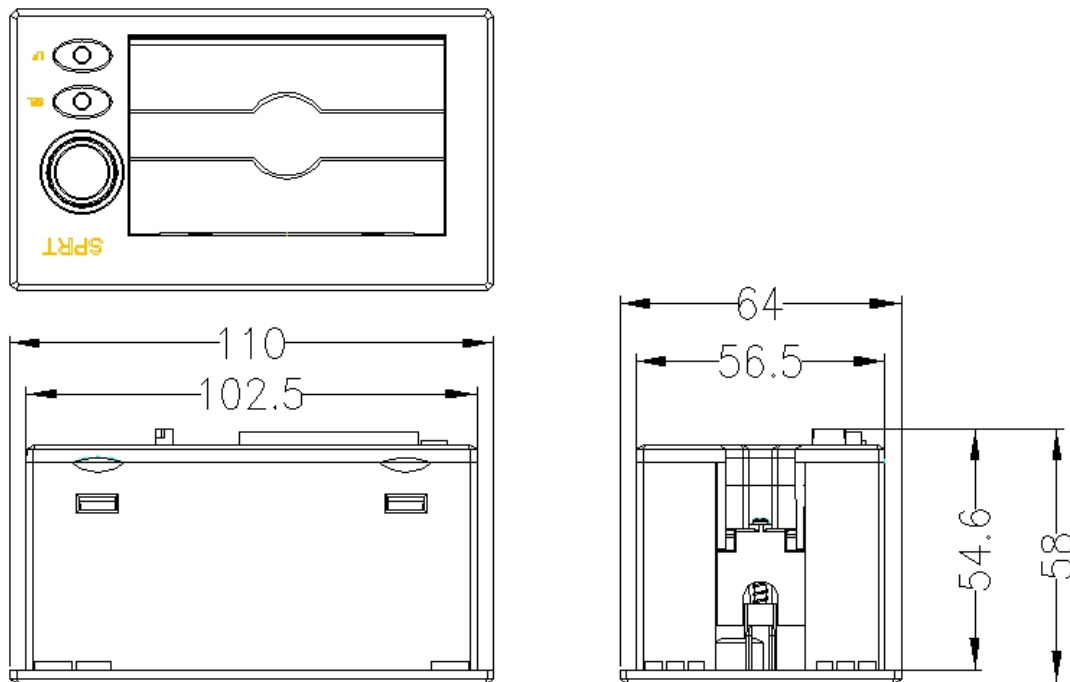


Fig 2-2 D9 outline dimensional drawing

2.3 Install the Paper Roll

Press the button, open the door, install the paper and close the door.

Chapter 3 Operating Instructions

3.1 Interface Connection

3.1.1 Serial interface connection

The serial interface is RS-232 and 485.

1. RS-232

The electrical level of RS-232 is EIA level and TTL level, supporting RTS/CTS and XON/XOFF handshake protocol, the interface is IDC10 pin type socket and 5 pin single socket, each type of socket mould number are defined as follows:

IDC10 pin type socket is defined as shown in figure 3-1:

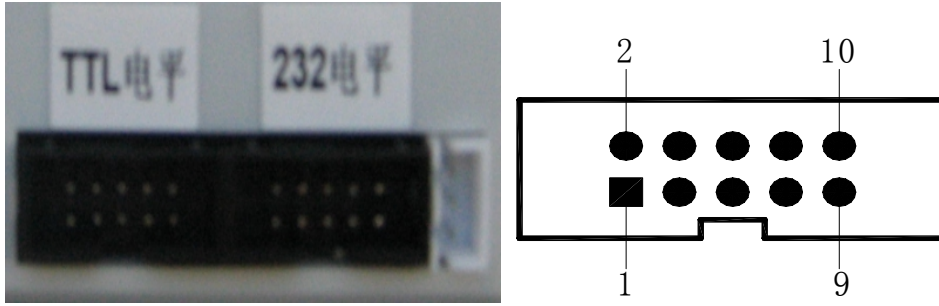


Figure 3-1 serial interface IDC10 pin type socket pin number
5PIN single serial interface socket of the serial number as shown in figure 3-2

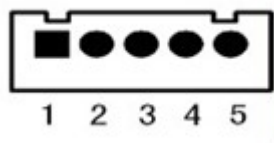


Figure 3-2 5 pin single serial interface socket pin number



Figure 3-3 USB interface socket pin number

The definition of each pin signal serial interface as shown in table 3-1:

Signal	IDC10 socket	5PIN socket	Source	Instruction
RXD	3	3	Host computer	Printer receives data from the host computer
TXD	2	2	Receipt Printer	Printer send data to host computer, when using ON/X - OFF handshake protocol, printer sends a control code X - ON/X - OFF to the host computer
CTS	8	4	Receipt Printer	The signal is the MARK that means the printer is busy can't accept data, when the signal is SPACE state that means printer: are ready to accept data
DSR	6	1	Receipt	The signal for SPACE state said printer

			Printer	online
GND	5	5	—	signal earth
DCD	1		Receipt Printer	Have same function with CTS

Table 3-1 serial interface socket pin definition

Note: (1) "source", said the source of the signal

(2) signal logic level was divided into EIA and TTL level based on the different of the jack ; Under serial connection mode, the baud rate and the structure of the data can be set by a button and the setting software, the factory has been set to 9600 BPS, 8 data bits, no calibration and a stop bit; There are two kinds of handshake to choose. One method is marker control, the other is a X - ON/X – OFF handshaking protocol, two kind of handshaking protocols are as shown in table 3-2:

Handshake	Direction of data	RS-232C interface signal
Marker control	Data can enter in	Signal line 1 and 8 is SPACE
	Data cannot enter in	Signal line 1 and 8 is Mark
X-ON/ X-OFF control	Data can enter in	Send X-ON code 11H on signal line 2
	Data cannot enter in	Send X-OFF code 13H on signal line 2

Table 3-2 two handshake

2. 485 Serial port

485 interface is for IDC10 pin type socket, socket pin number as shown in figure 3-1, the pin is different with RS - 232 interface, 485 interface is IDC10 pin which is closed to power type, specific pins are defined as follows:

Sig nal	IDC10 pin type socket pin number
A	7
B	9

Table 3-3 485 interface socket pin definition

3.1.2 Parallel interface connection

RMD9 printer's parallel interface is compatible with CENIRONICS, the interface socket is 26 line flat cable plug socket or its substitute adaptor, parallel interface socket pin number shown in the figure below:

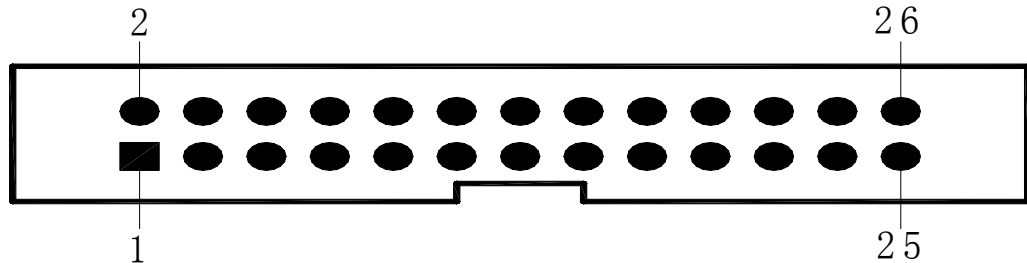


Figure 3-3 parallel interface socket pin number

The definition of each pin signal parallel interface is shown in the following table

Pin No.	Signal	Direction	Description
1	/STB	In	Strobe pulse to latch data, reading occurs at rising edge.
3	DATA1	In	These signals represent the 1 st bit to 8 th bit of the parallel data representatively, each signal is at HIGH level when data is logic 1, and LOW when data is logic 0.
5	DATA2	In	
7	DATA3	In	
9	DATA4	In	
11	DATA5	In	
13	DATA6	In	
15	DATA7	In	
17	DATA8	In	
19	/ACK	Out	Answering pulse, LOW level signal indicates that data have already been received and the printer gets ready to receive the next data.
21	BUSY	Out	Answering pulse, "LOW" level signal indicates that data have already been received and the printer gets ready to

			receive the next data.
23	/PE	Out	“HIGH” level signal indicates that paper is end, “LOW” indicates that paper is available.
25	SEL	---	Pulling up to” HIGH” level signal by a resistor indicates the printer is on-line.
4	/ERR	Out	Pulling up to “HIGH” level signal by a resistor indicates that there is no error.
2、 6、 8	NC	---	No connection
10、 12、 14、 16、 18、 20、 22、 24	GND	---	Grounding logical 0 level

Fig.3-4Pin Assignment of Parallel Interface

Notice: (1) “In” means input to the printer, “Out” means output from the printer.
(2) Logic level of signal is TTL standard.

3.1.3 USB Interface connection

Mini-USB PIN Assignment:

Pin	Function	Mark
1	V Bus	Power positive5V
2	Data-	Data-
3	Data+	Data+
4		Blank
5	GND	Grand

3.1.4 The printer parameter Settings

The printer parameter can be set by the two methods

1. Through the software

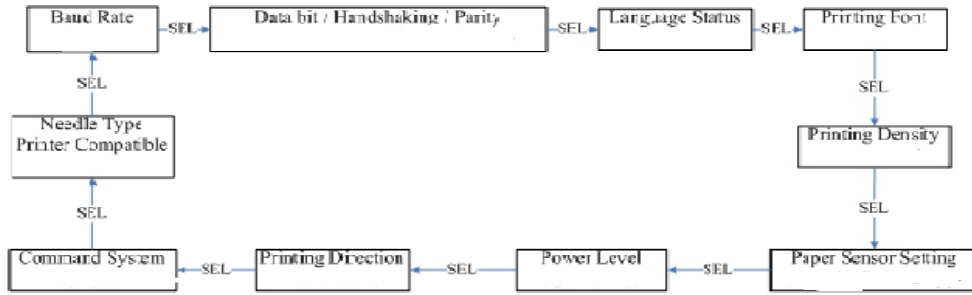
Download the setting tool from our company website to download tool software.

2, through the SEL and LF combination

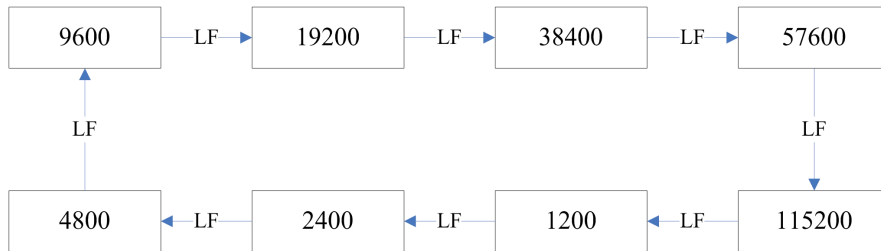
Enter the parameter Settings mode: Press the [LF] button and power on, the red indicator light will flash once every 1 second, loosening [LF] button after the indicator light flashes three times, the printer enters parameter Settings mode, and print out the message. With the [SEL] button set items, each click on the [SEL] button and set the change for the next term, and print out the current value. With [LF] key to select the set value, per click [LF] key, the set value change to next value.

Exit the parameter Settings: Press the [LF], and then press the [SEL] button and then release the two buttons, the printer will print out the "Exit Set Mode" message, the printer has been saved to Set the values of the parameters. Exit parameters setting Mode, the printer will be into the normal working Mode. If directly close the printer power supply, the set of parameter values will not be saved.

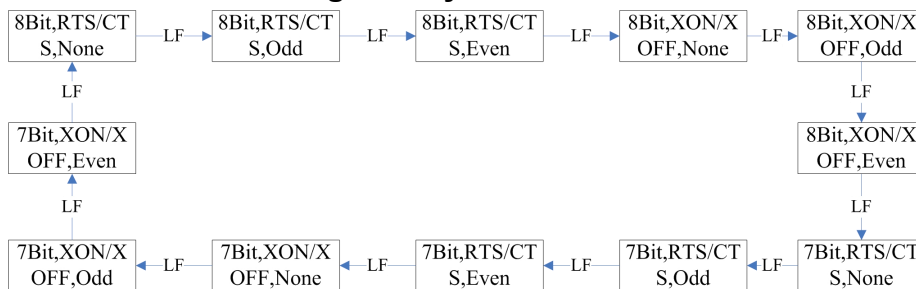
Baud rate setting (parallel and serial interface format)



1. Baud Rate:



2. Data bit / Handshaking / Parity:

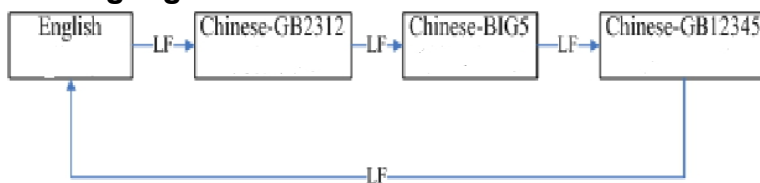


Introduction: Data Bit: 8bit or 7 bits

Handshaking: RTS/CTS or XON/XOFF

Parity: None or Odd or Even

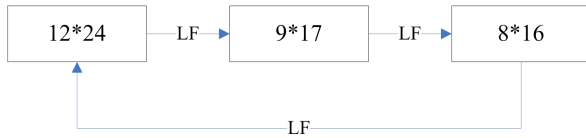
3. Language Status:



Introduction:

1. GB12345 is traditional character that corresponds with national standard secondary character GB2312.
2. The standard 24-dot model only supports national standard primary and secondary character library GB2312, the 16-dot model supports BIG5 and the national standard GB12345.

4. Printing Font:

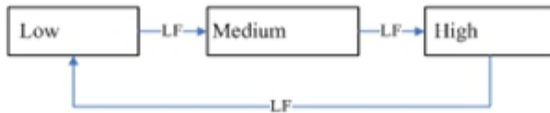


Instruction: characters font is only effective in character mode, English mode only 6 * 8

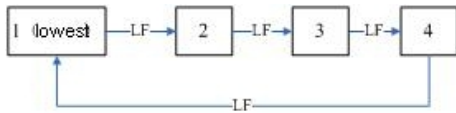
5. Printing Density:



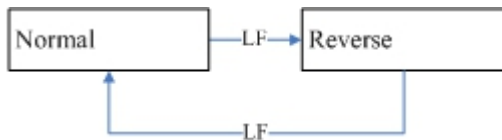
6. Paper Sensor Setting



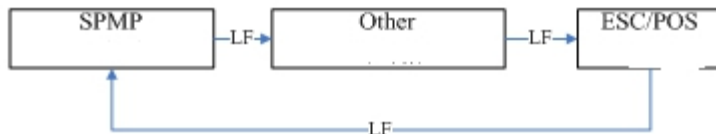
7. Power Level



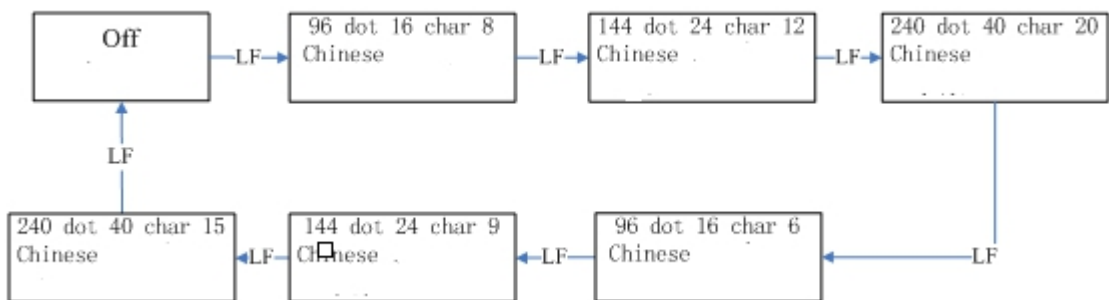
8. Printing Direction



9. Command System



10. Dot Matrix Printer Compatible:



Dot matrix printer model can be alternatively choose through this setting:

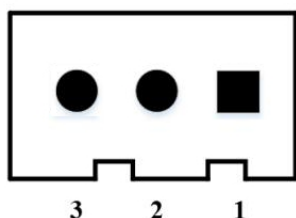
First, after selecting this setting, power consumption level can be choose.
 Second, after choosing dot matrix printer compatible, function of choosing characters and Chinese characters size will not be supported.

3.1.5 Power supply

SP-RMD9P/S/Q H:Input DC5V~8.5V Current: 3A

SP-RMD9VP/VS/VQ/VUS H: Input DC9V~24V Current: 3A

Power socket is like the following figure3-5, PIN assignment of power socket is like below figure 3-6:



PIN Number	PIN Assignment	Instruction
1	VIN	Power Input
2	NC	NC
3	GND	GND

Figure 3-5 Power Socket Drawing Figure 3-6 PIN Assignment for power socket

3.2 Indicator and Button

The function of buttons will be different according to the different working mode. In setting mode, please refer to 3.1.3. In normal working mode, please check below.

Online button (SEL)

This button can switch online and offline status. Under online status, printer is usable, under offline status, [LF] button is usable, default status is online after powered on.

Feeding button (LF)

Power indicator LED (green)

To indicate power on or off status.

Error and busy status indicator LED

(red):

Indicator Status	Description
Off	Work normally
Flicker once every one second	Paper out, will recover after loading paper

Flicker twice every one second	Printer head is overheat, it will recover after cool down
Flicker three times every one second	Heating plate on printer head is broken, irrecoverable error, need to

Note: when the printer is under BUSY status, the red light will light up.

3.3 Self-test and HEX mode

Self-test can test whether the printer works normally, if it can print the self-test receipt clearly, then the printer is well except the interface connect with the host. Otherwise the printer needs checking and repairing.

Self-test paper sample analysis

The self-test sequence prints configuration information such as software version number, interface format, and characters. The self-test spline list is shown below:



Figure 3-4 self-checking list of receipt

No.	Content of self-test paper in English	Content of self-test paper in Chinese
-----	---------------------------------------	---------------------------------------

1	Version: R-708 1.00	版本号: R-708 1.00
2	Model: SP-RMD9	机型: SP-RMD9
3	Interface: RS232 (EIA, TTL) Interface: Parallel	接口类型: RS232串口 (EIA, TTL) 接口类型: 并口
4	Baud Rate: 9600	波特率: 9600
5	Data bit/Handshaking/Parity:8 bit / RTS/CTS / None	串口数据位/握手方式/校验方式: 8位/标志控制/无校验
6	Language Status:Chiese-GB2312	语言: 简体中文 (国标一二级字库)
7	Printing Font: 12*24	字符字体: 12*24
8	Printing Density: Medium	打印浓度: 中
9	Paper Sensor Setting: Medium	测纸传感器灵敏度: 中
10	Power Level: 3	功耗级别: 3
11	Printing Direction: Reverse	打印方向: 反向
12	Command System: SPMP	指令集: SPRT微打指令集
13	Needle Type Printer Compatible: off	针打兼容:关闭
14	Default Codepage: No	默认代码页: 无

Remarks:

1. Since the default parameters of the printer may be different as default set, the font size and contents in picture is just sample for reference.

2. For the specific content of each setting item, refer to the section "3.1.3 Printer Parameter Setting". After manually setting, you can print the self-test paper to confirm whether the corresponding parameter is set successfully.

Self-test

1. Press **【SEL】** and connect power supply, release it and self-test paper will be printed out.

2. In normal printing statue, press **【SEL】** once, then press **【LF】** and press **【SEL】** .

Hex mode

Press 【LF】 and connect power supply, the red indicator will flash every one second, after the indicator flashes three times release the【LF】. After that the red indicator still flashes then stop flashing, the printer prints out “Hexadecimal Dump”, the printer enters into Hex printing mode.

Upgrade mode

Under off status, press [SEL] and [LF] buttons and connect power cable, release these two buttons while powered on. At this time, the SEL indicator will flash at 1 second, indicating that the printer has entered the upgrade mode.

Note: The USB interface model can only be upgraded with USB and does not support serial port upgrade.

3.4 Initialization

There are two methods: One is to use the control code ESC @, the host sends a command to the printer using software initialization; The second is to restart the printer.

Chapter 4 Printing Command

4.1 Summary

All the print commands for RMD9 are fully compatible with traditional ESC print commands. Each command is described in following format:

<u>Command name</u>	<u>Function</u>
---------------------	-----------------

Format: ASCII: the standard ASCII character sequence

Decimal: the Decimal number sequence

Hexadecimal: the Hexadecimal number sequence

Explanation: what the command does and how to use it.

Example: some examples are listed to illustrate the command for better understanding.

The following is the description of each command according to the function of each command.

4.2 Commands Description

4.2.1 Paper Feeding Commands

LF Feed Line

Format: ASCII: LF
Decimal: 10

Hexadecimal: 0A

Explanation:

The printer feeds paper forwards one line.

ESC J n Dot Line Feed

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

Explanation:

The printer feeds paper n dot lines. n=1~255.

This command doesn't send carriage return and feed line. It won't influence the latter feed line command.

If you need to feed paper immediately but no carriage return, can use ESC J command.

Line spacing will be adjusted automatically when using commands ESC V, ESC W and FS W for enlarging characters.

ESC 1 Set n Dot-line Spacing

Format: ASCII: ESC 1 n
Decimal: 27 49 n
Hexadecimal: 1B 31 n

Explanation:

The line spacing is set to n dot-lines for future Line Feed command. n=0~255, default setting n=6 for text printing, n=0 for bit map printing when using ESC K command.

The BASIC programs for observing the effect of this command are as below:

```
FOR I=1 TO 11 STEP 2
PRINT CHR$(27);CHR$(49);CHR$(I); ' ESC 1 set line spacing
LPRINT "RMWD TEST"           ' Print character string and feed line
NEXT I
```

The print result of the said programs for D9 is as following:



4.2.2 Format Setting Commands

ESC B		Set Vertical Tab Value		
Format:	ASCII:	ESC	B	n1 n2 n3...NUL
	Decimal:	27	66	n1 n2 n3...0
	Hexadecimal:	1B	42	n1 n2 n3...00

Explanation:

The vertical tab positions are entered as n1, n2 and so on, all of these should be within the page length set by ESC C command.

Command NUL added at the end indicates the command is over.

VT command is to carry out vertical tab, the paper fed to the next vertical position.

All vertical tab positions that input can be deleted by using this command in ESC B NUL format.

Example: set three vertical tab values at 2nd line, 5th line, 8th line in one page, you can send the following commands:

```
ASCII:      ESC   B   STX   ENQ   BS   NUL
```

Decimal:	27	66	2	5	8	0
Hexadecimal:	1B	42	02	05	08	00

The BASIC programs for sending the said sequences are as below:

LPRINT CHR\$ (27); "B"; CHR\$ (2); CHR\$ (5); CHR\$ (8); CHR\$(0);

'ESC B command

LPRINT CHR\$ (11); 'VT command

LPRINT "SPRM1"; 'Print character string

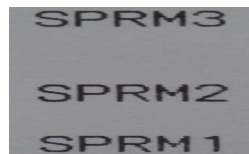
LPRINT CHR\$ (11); ' VT command

LPRINT "SPRM2"; 'Print character string

LPRINT CHR\$ (11); 'VT command

LPRINT "SPRM3"; 'Print characters

The print result is as following:



VT Carry out Vertical Tab Value

Format: ASCII: VT Decimal:

11

Hexadecimal: 0B

Explanation:

Feed paper to the next vertical tab position which is set by ESC B command.

Notice: if there is no vertical tab value setting, or the current position equals or is beyond the last vertical tab position, VT command is to feed paper one line only (same to LF command).

Explanation:

Feed paper to the next vertical tab position which is set by ESC B command.

Notice: if there is no vertical tab value setting, or the current position equals or is beyond the last vertical tab position, VT command is to feed paper one line only (same to LF command).

ESC D Set Horizontal Tab Value

Format: ASCII: ESC D n1 n2 n3...NUL

Decimal: 27 68 n1 n2 n3...0

Hexadecimal: 1B 44 n1 n2 n3...00

Explanation:

The tab positions are entered as n1, n2 and so on, all of these should be within the line width of this model printer.

Command NUL added at the end indicates the command is over.

All horizontal tab positions that set can be deleted by using this command in ESC D NUL format.

Example: set three horizontal tab values at 2nd, 9th line, 14th character position in one line, you can send the following commands:

ASCII:	ESC	D	STX	HT	SO	NUL
Decimal:	27	68	2	9	14	0
Hexadecimal:	1B	44	02	09	0E	00

The BASIC programs for this example are as below:

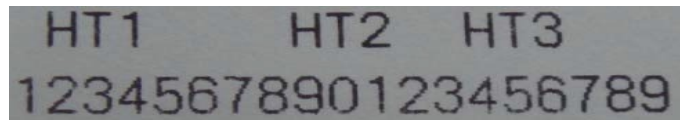
```

10 LPRINT "12345678901234567890123456789012" 'Ruler
20 LPRINT CHR$ (27); "D"; CHR$ (2); CHR$ (9); CHR$ (14); CHR$ (0); 'ESC D
command
30 LPRINT CHR$ (9); 'HT command
40 LPRINT "HT1"; 'Print character string

50 LPRINT CHR$ (9); 'HT command
60 LPRINT "HT2"; 'Print character string
70 LPRINT CHR$ (9); 'HT command
80 LPRINT "HT3"; 'Print character string

```

The print result is as following:



HT Carry out Horizontal Tab Value

Format: ASCII: HT

Decimal: 9

Hexadecimal: 09

Explanation:

The print position is advanced to the next horizontal tab position which is set by ESC D command.

If there is no horizontal tab value setting, or the current position equals or is beyond the last horizontal tab position, HT command won't be carried out.

ESC f Print Blank Characters or Lines

Format: ASCII: ESC f m n

Decimal: 27 102 m n

Hexadecimal: 1B 66 m n

Explanation:

When m=0, ESC f NUL n will command to print n blank characters, the value of n should be within the line width of this model printer.

When m=1, ESC f SOH n will command to print n blank lines. n=0~255.

Example: print 6 blank characters in one line, you can send the following commands:

ASCII:	ESC	f	NUL	ACK
Decimal:	27	102	0	6
Hexadecimal:	1B	66	00	06

Another example: print 6 blank lines, you can send the following commands:

ASCII:	ESC	F	SOH	CK
Decimal:	27	102	1	6
Hexadecimal:	1B	66	01	06

<u>ESC 1</u>				<u>Set Left Margin</u>
Format:	ASCII:	ESC	1	n
	Decimal:	27	108	n
	Hexadecimal:	1B	6C	n

Explanation:

The value of n should be in the range from 0 to the line width of this model printer.

Default n=0, that means no left margin.

This command sets absolute position, and won't be influenced by character enlarging commands ESC U and ESC W.

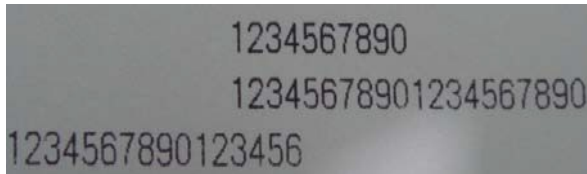
Example: set left margin value to 12, you can send the following commands:
commands:

ASCII:	ESC	1	ACK
Decimal:	27	108	12
Hexadecimal:	1B	6C	0C

The BASIC programs for this example are as below:

```
LPRINT "1234567890123456" 'Ruler
LPRINT CHR$(27); CHR$(108);CHR$(12); 'ESC 1 command
LPRINT "123456789012345678901234567890"
```

The print result is as following:



ESC Q Set Right Margin

Format:	ASCII:	ESC	Q	n
	Decimal:	27	81	n
	Hexadecimal:	1B	51	n

Explanation:

The value of n should be in the range from 0 to the line width of this model printer.

Default n=0, that means no right margin.

This command sets absolute position, and won't be influenced by character enlarging commands ESC U and ESC W.

After setting this command, the printer will carry out carriage return and feed line as long as the right margin position is reached.

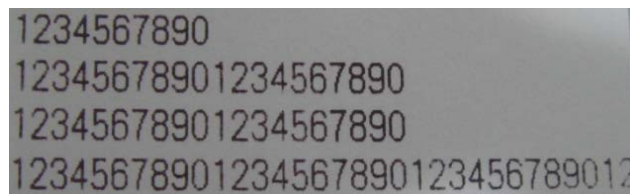
Example: set right margin value to 12, you can send the following commands:

ASCII:	ESC	Q	ACK
Decimal:	27	81	12
Hexadecimal:	1B	51	0C

The BASIC programs for this example are as below:

```
LPRINT "12345678901234567890123456789012" 'Ruler
LPRINT CHR$(27); "Q"; CHR$(12); 'ESC Q command
LPRINT "123456789012345678901234567890";
LPRINT "12345678901234567890"
```

The print result is as following:



ESC P Set word space

Format:	ASCII:	ESC	P	n
	Decimal:	27	81	n
	Hexadecimal:	1B	70	n

Explanation:

This command is to set the empty points between words, valid to Chinese character at the same time .

Default is 0, that means there is no empty between words, n is between 0-255.

4.2.3 Character Setting Commands

<u>ESC U</u>		<u>Enlarge Width</u>		
Format:	ASCII:	ESC	U	n
	Decimal:	27	85	n
	Hexadecimal:	1B	55	n

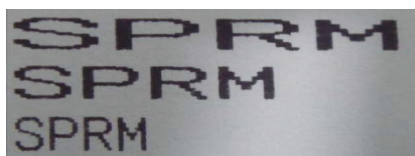
Explanation:

The characters and graphics following this command are printed at n times of normal width, n=1~8, default n=1, that means it is the normal width.

The BASIC programs for observing the enlarging effect of this command are as below:

```
FOR I=1 TO 3          ' from 1 to 3 times
LPRINT "CHR$ (27); CHR$ (85);CHR$ (I);   'ESC U command
LPRINT "SPRM";          'Print character string
NEXT I                'CR command
```

The print result is as following:



<u>ESC V</u>		<u>Enlarge Height</u>		
Format:	ASCII:	ESC	V	n
	Decimal:	27	86	n
	Hexadecimal:	1B	56	n

Explanation:

The characters and graphics following this command are printed at n times of normal height, n=1~8, default n=1.

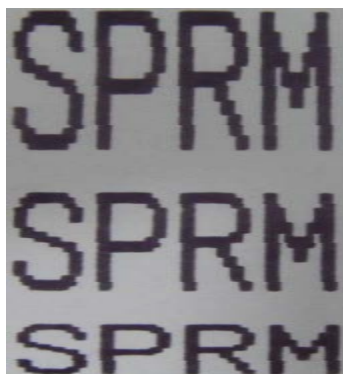
This command should be sent at the beginning of one line.

The BASIC programs for observing the enlarging effect of this command are as below:

```
FOR I=1 TO 3          ' from 1 to 3 times
LPRINT CHR$ (27); CHR$ (86); CHR$ (I);   'ESC V command
LPRINT "SPRM";          'Print character string
```


NEXT I

The print result is as following:



ESC W Enlarge Width and Height

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

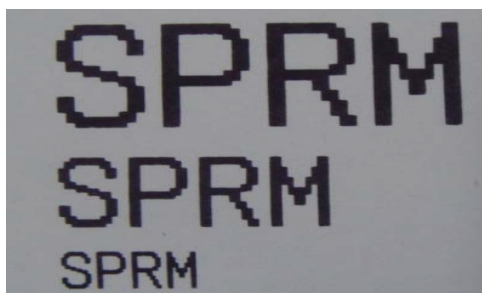
Explanation:

The characters and graphics following this command are printed at n times of normal width and height, n=1~8, default n=1.

The BASIC programs for observing the print effect of this command are as below:

```
FOR I=1 TO 3                                ' from 1 to 3 times
LPRINT CHR$ (27); CHR$ (87); CHR$ (I);      'ESC W command
LPRINT "SPRM";                               'Print character string
NEXT I
```

The print result is as following:



ESC + Select/cancel Up-line Print

Format:	ASCII:	ESC	+	n
	Decimal:	27	43	n
	Hexadecimal:	1B	2B	n

Explanation:

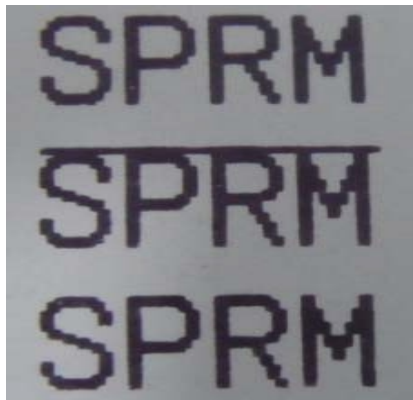
When n=1, select up-line print; when n=0, cancel up-line print.

All characters including spaces will be printed out with up-line after selecting up-line print, unless cancel the up-line print command.

The BASIC programs for observing the effect of this command are as below:

```
LPRINT CHR$ (27); CHR$ (57); CHR$ (2);           ' Enlarge the width and height twice
LPRINT "SPRM";
LPRINT CHR$ (27); CHR$ (43);CHR$ (1);           ' Select up-line print
LPRINT "SPRM";                                   ' SPRM print with up-line
LPRINT CHR$ (27); CHR$ (43);CHR$ (0);           ' Cancel up-line print
LPRINT "SPRM";
```

The print result is as following:



ESC i Select/cancel Reverse White Print

Format:	ASCII:	ESC	i	n
	Decimal:	27	105	n
	Hexadecimal:	1B	69	n

Explanation:

When n=1, select reverse white print; when n=0, cancel reverse white print. Reverse white print is printing in the black background, just like the film of photography.

It is normal print that printing black characters in white background, it is selected at power on or on ESC @ command.

The BASIC programs for reverse white print are as below:

```
10 LPRINT CHR$ (27); CHR$ (105); CHR$ (1);       ' Select reverse white print
20 LPRINT "SPRD"
```

The print result is as following:



ESC c Select/cancel Reverse Print

Format:	ASCII:	ESC
---------	--------	-----

c	n			
	Decimal:	27	99	n
	Hexadecimal:	1B	63	n

Explanation:

When n=1, select reverse print; when n=0, cancel reverse print. Default n=1.

Reverse print not only supports character mode but also supports graphics mode. When print the graphics in reverse direction, pay attention to the print order of graphic units, please see ESC K command.

ESC 6 Choose Characters Set 1

Format:	ASCII:	ESC	6
	Decimal:	27	54
	Hexadecimal:	1B	36

Explanation: After inputting this command, all the characters will be printed out according to the Characters Set 1 in ANK.

ESC 7 Choose Characters Set 2

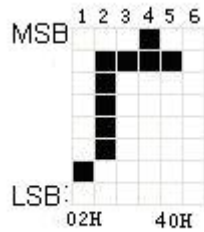
Format:	ASCII:	ESC	7
	Decimal:	27	55
	Hexadecimal:	1B	37

Explanation: After inputting this command, all the characters will be printed out according to the Characters Set2 in ANK.

4.2.4 User-defined Character Setting Commands

ESC	&	<u>User Define Character</u>				
Format:	ASCII:	ESC	&	m	n1	n2.....n6
	Decimal:	27	38	m	n1	n2.....n6
	Hexadecimal:	1B	26	m	n1	n2.....n6

Explanation: This command permits user to define one character. Parameter m is character code the user defines, m=32~255; parameter n1, n2.....n6 is structure code to define this character. The character dots should be 6x8, which means 6column and 8dots each column. There is one character byte in each column and the MSB is on the tope as below picture,



User-defined character is saved in RAM and will be lost after power off. If several ESC & commands use the same m value, only the last one is valid. At most 32 characters can be defined by users. Ref: ESC% and ESC: commands.

ESC %	Replace User-defined Character							
Format: ASCII:	ESC %	m1	n1	m2	n2.....mk	nk	NUL	
Decimal:	27	37	m1	n1	m2	n2.....mk	nk	0
Hexadecimal:	1B	25	m1	n1	m2	n2.....mk	nk	00

Explanation:

This command is used to replace character n in current characters set to user-defined character m. After using this command, the user-defined character m will be printed out instead of character n in current characters set.

m1,m2.....mk is user-defined character code.

n1,n2.....nk is replaced character code in current character set.

Both the value of m and n should be 32~255. Subscript k should be 1~32. The largest character number which can be replaced is 32. Character NUL is added at the end to mean the command is over. Ref: ESC % and ESC : command.

Remark: No matter in Chinese mode or character mode, replacing character will be printed when printing this character code.

ESC :	Recover Character in Character Set	
Format: ASCII:	ESC	:
Decimal:	27	58
Hexadecimal:	1B	3A

Explanation:

This command is used to recover original character in character set. This character has been replaced by user-defined character through command ESC % previously. However, the used-defined character won't be deleted from RAM and still can be used through ESC % command.

The BASIC programs to observing the effect of ESC &, ESC % and ESC : commands are as below:

```

10 LPRINT CHR$(27); "W"; CHR$(8); 'Enlarge 8times from Width and Height
20 LPRINT CHR$(27); "&"; CHR$(65); 'ESC & command
30 LPRINT CHR$(&H02); CHR$(&H7C); CHR$(&H40);
40 LPRINT CHR$(&HC0); CHR$(&H40); CHR$(&H00);
50 LPRINT CHR$(27); "%"; CHR$(65); CHR$(65); CHR$(0); 'ESC % command
60 LPRINT CHR$(65); CHR$(13); 'print user-defined character
70 LPRINT CHR$(27); CHR$(58); 'ESC : command

```

80 LPRINT CHR\$(65);

'print original character

The print result of the above programs is as following:



4.2.5 Graphics Printing and Codepage Choosing Commands

ESC K	Print bit-map graphics				
Format:	ASCII:	ESC	K	n1	n2....data.....
	Decimal:	27	75	n1	n2....data.....
	Hexadecimal:	1B	4B	n1	n2....data.....

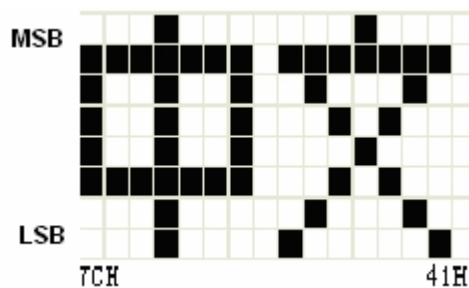
Explanation:

This command is used to print $(n2 \times 256 + n1) \times 8$ bit map. The width of this graphics is $(n2 \times 256 + n1)$ dots and the height is 8 dots. Each column has 8 dots and can be presented by a 8-bit byte, the MSB is on the top.

The values of n1, n2 denote a 16-bit binary data, n1 is LSB, n2 is MSB, to mean that the width of printed bitmap through ESC K command is $n2 \times 256 + n1$. In our printer series, $n2 = 0/1$. The sum of dots number should be ≤ 384 . Data are the bytes content of each column in this graphics. The bytes number should equal to $n2 \times 256 + n1$.

Remark: If the width of printed graphics is beyond the remaining width of current line, the beyond part of graphics won't be printed out and the printed position will change to the next line.

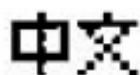
For example: If you want to print two Chinese characters "中文" with ESC K command, the bit-map for the two Chinese is as the below figure shows. Each character is composed by 7×8 dots to 7 columns, there is a space between the two characters, so totally there are 15 columns, then $n1 = 15$, $n2 = 0$, the 15-byte data showed in hexadecimal are as follows: 7C, 44, 44, FF, 44, 44, 7C, 00, 41, 62, 54, C8, 54, 62, 41



The BASIC programs for this example are as below:

```
LPRINT CHR$(27); "W"; CHR$(4); 'Enlarge the width and height 4 times
LPRINT CHR$(27); "K"; CHR$(15); CHR$(0); 'ESC K command
LPRINT CHR$( &H7C); CHR$( &H44); CHR$( &H44); CHR$( &HFF);
LPRINT CHR$( &H44); CHR$( &H44); CHR$( &H7C); CHR$( &H0);
LPRINT CHR$( &H41); CHR$( &H62); CHR$( &H54); CHR$( &HC8);
LPRINT CHR$( &H54); CHR$( &H62); CHR$( &H41);
LPRINT CHR$(10); CHR$( &H13); 'enter to print
text
```

The print result is as following:



<u>ESC ' _____</u>	<u>Print Curve I _____</u>
Format: ASCII:	ESC ' mL mH n1L n1H n2L n2H.....n1L n1H CR
Decimal:	27 39 mL mH n1L n1H n2L n2H.....n1L nh 13
Hexadecimal:	1B 27 mL mH n1L n1H n2L n2H.....n1L nh
<u>OD _____</u>	

Explanation:

This command is used to print curve along the paper-feeding direction. The value of m is the number of cruves to be printed, m=0~255.

There are m dots of curve in one horizontal line. n1L n1H n2L n2H.....n1L n1H presents the positions of these m curves. The numbers of n1L or n1H should equal to m. Each dot should be within the largest dots numbers of printer. The last CR ("enter") is used to print out this dot line. The whole m curves are printed out through each dot line by n1L n1H n2L n2H.....n1L n1H data.

Remark: The dot whose position is beyond the paper width won't be printed out. This command is valid no matter there is OD or not.

<u>ESC , _____</u>	<u>Print Curve II (supplement dots automatically to be full curve) _____</u>
Format: ASCII:	ESC , m n1L n1H n2L n2H.....n1L n1H CR
Decimal:	27 44 m n1L n1H n2L n2H.....n1L nh 13
Hexadecimal:	1B 2C m n1L n1H n2L n2H.....n1L nh OD

Explanation:

The using explanation is same as the command for Printing Curve I.

FS P		Print Pre-saved Bitmap		
[Format]	ASCII:	FS	P	n
	Decimal:	28	80	n
	Hex:	1C	50	n

Explanation:

0 ≤ n ≤ 2, this command is used to print the monochrome bitmap which is pre-saved in the Flash memory of printer. The bitmap in Flash memory can be created and wrote into printer through Setting Tool in PC. The largest width of bitmap is 384dots and the largest height is 1365dots. (The bitmap can't be over 64km.) "n" is the number of bitmap.

Remark: If the number of bitmap isn't defined, this command is invalid.

The bitmap must be monochrome.

This command won't be affected by printing mode (underline, character size or reverse white printing).

If the width of printed bitmap is beyond one line, the beyond part won't be printed out.

It needs the special setting tool to download the bitmap. Pls ref. (RMDIIID Setting Tool). The downloaded bitmap through this method won't be low, unless it is covered by other bitmap.

ESC t		Choose Codepage		
Format:	ASCII:	ESC	t	n
	Decimal:	27	116	n
	Hexadecimal:	1B	74	n

Explanation:

0 ≤ n ≤ 45, when n is 0xFE, cancel choosing codepage. The character will be printed out according to Codepage Table in Appendix 2. Default n=0xFE, which means no codepage is chosen.

Choose codepage on n page from the following Codepage Table. The value of n is in decimal

format.

n	代码页	Code Page
0	CP437 [美国, 欧洲标准]	CP437 [U.S.A., Standard Europe]
1	KataKana [片假名]	Katakana
2	PC850 [多语言]	PC850 [Multilingual]
3	PC860 [葡萄牙]	PC860 [Portuguese]
4	PC863 [加拿大-法语]	PC863 [Canadian-French]
5	PC865 [北欧]	PC865 [Nordic]
6	WCP1251 [斯拉夫语]	WCP1251 [Cyrillic]
7	CP866 斯拉夫 2	CP866 Cyrilliec #2
8	MIK[斯拉夫/保加利亚]	MIK[Cyrillic /Bulgarian]
9	CP755 [东欧, 拉脱维亚 2]	CP755 [East Europe, Latvian 2]
10	[伊朗, 波斯]	Iran
11	保留	reserve

12	保留	reserve
13	保留	reserve
14	保留	reserve
15	CP862 [希伯来]	CP862 [Hebrew]
16	WCP1252 [拉丁语 1]	WCP1252 Latin I
17	WCP1253 [希腊]	WCP1253 [Greek]
18	CP852 [拉丁语 2]	CP852 [Latina 2]
19	CP858 [多种语言拉丁语 1+ 欧元符]	CP858 Multilingual Latin I +Euro)
20	伊朗 II [波斯语]	Iran II
21	拉脱维亚	Latvian
22	CP864 [阿拉伯语]	CP864 [Arabic]
23	ISO-8859-1 [西欧]	ISO-8859-1 [West Europe]
24	CP737 [希腊]	CP737 [Greek]
25	WCP1257 [波罗的海]	WCP1257 [Baltic]
26	泰文 (与 TM-88 Thai character code 14 同)	Thai
27	CP720 [阿拉伯语]	CP720 [Arabic]
28	CP855	CP855
29	CP857 [土耳其语]	CP857 [Turkish]
30	WCP1250 [中欧]	WCP1250 [Central Eurpoe]
31	CP775	CP775
32	WCP1254 [土耳其语]	WCP1254 [Turkish]
33	WCP1255 [希伯来语]	WCP1255 [Hebrew]
34	WCP1256 [阿拉伯语]	WCP1256 [Arabic]
35	WCP1258 [越南语]	WCP1258 [Vietnam]
36	ISO-8859-2 [拉丁语 2]	ISO-8859-2 [Latin 2]
37	ISO-8859-3 [拉丁语 3]	ISO-8859-3 [Latin 3]
38	ISO-8859-4 [波罗的语]	ISO-8859-4 [Baltic]
39	ISO-8859-5 [斯拉夫语]	ISO-8859-5 [Cyrillic]
40	ISO-8859-6 [阿拉伯语]	ISO-8859-6 [Arabic]
41	ISO-8859-7 [希腊语]	ISO-8859-7 [Greek]
42	ISO-8859-8 [希伯来语]	ISO-8859-8 [Hebrew]
43	ISO-8859-9 [土耳其语]	ISO-8859-9 [Turkish]
44	ISO-8859-15 [拉丁语 9]	ISO-8859-15 [Latin 3]
45	[泰文 2]	Thai2

4.2.6 Initialization Commands

ESC @ Initialize Printer
Format: ASCII: ESC @

Decimal:	27	64
Hexadecimal:	1B	40

Explanation:

This command is to initialize the following contents of the printer:

- Clear the data in the print buffer;
- Restore the default;
- Delete user-defined characters.

4.2.7 Data Control Commands

<u>CR</u>	<u>Carriage Return</u>
Format: ASCII:	CR
Decimal:	13
Hexadecimal:	0D

Explanation:

When the “CR” command is sent to printer, all data in the print buffer will be printed out and paper will be fed one line.

<u>NUL</u>	<u>NUL</u>
Format: ASCII:	NUL
Decimal:	0
Hexadecimal:	00

Explanation:

NUL command is used as the final code in some commands such as ESC B, ESC D, ESC% and ECS ', to denote these commands are over. NUL command is ignored when used alone.

4.2.8 Chinese Character Print Commands

The command to print Chinese character is FS standard command. All Level I&II Chinese characters and graphics, etc in 16dots&24dots Chinese character library are according to Chinese National Standard GB2312-80. For 24dots, there are only graphics, symbols, etc I A1 and A9 zone are 24dots. Each Chinese character has two bytes. Big5 characters with 16dots are in Traditional Chinese characters library.

The following is the detailed of Chinese Character Print Commands:

<u>FS &</u>	<u>Select Chinese Print Mode</u>
Format: ASCII:	FS &

Decimal:	28	38
Hexadecimal:	1C	26

Explanation:

After printer received this command, it will switch from ASCII character print mode to Chinese character print mode. Using GB Chinese Character Library I&II.

Notice: This command is used to switch printer into Chinese Mode when printer is in normal printing mode, but won't be saved after power off. Only after setting through Setting Tool, the result can be saved.

FS . Cancel Chinese Print Mode

Format:	ASCII:	FS	.
	Decimal:	28	46
	Hexadecimal:	1C	2E

Explanation:

After printer received this command, it will switch from Chinese character print mode to ANK characters print mode.

Notice: This command is used to switch printer into ANK characters print mode when printer is in normal printing mode, but won't be saved after power off. Only after setting through Setting Tool, the result can be saved.

FS SO Set Chinese Double Width Print

Format:	ASCII:	FS	SO
	Decimal:	28	14
	Hexadecimal:	1C	0E

Explanation:

Characters following this command are printed at twice their normal width, does not enlarge the height.

Notice: this command is valid only in one line.

FS DC4 Cancel Chinese Double Width Print

Format:	ASCII:	FS	DC4
	Decimal:	28	20
	Hexadecimal:	1C	14

Explanation:

This command is to cancel FS SO command.

FS W Set the Enlarging Multiple of Chinese Character

Format:	ASCII:	FS	W	n
---------	--------	----	---	---

Decimal:	28	87	n
Hexadecimal:	1C	57	n

Explanation:

Characters following this command are printed at n times of their normal width and height, n=1~8

<u>FS J</u>	<u>Set Vertical Print</u>		
Format: ASCII:	FS	J	
Decimal:	28	74	
Hexadecimal:	1C	4A	

Explanation:

This command is to print Chinese characters vertically, which is that to print characters by rotating 90° at anticlockwise direction.

<u>FS K</u>	<u>Set Horizontal Print</u>		
Format: ASCII:	FS	K	
Decimal:	28	75	
Hexadecimal:	1C	4B	

Explanation:

This command is to print Chinese characters horizontally, if have not set rotation, the Chinese characters will be printed horizontally, that is normal print status.

<u>FS I</u>	<u>Set Chinese Character Rotational Print</u>		
Format: ASCII:	FS	I	n
Decimal:	28	73	n
Hexadecimal:	1C	49	n

Explanation:

This command is to rotate Chinese characters, the values of n are as following (Default is 180°):

n	Characters rotated at anticlockwise direction
0	0°
1	90°
2	180°
3	270°
other	invalid

FS - Chinese Character with Underline Print

Format:	ASCII:	FS	-	n
	Decimal:	28	45	n
	Hexadecimal:	1C	2D	n

Explanation:

The specified Chinese characters after this command are printed with underline. When LSB n=1, underline selected; when LSB n=0, it canceled.

Remark: Only LSB of n is valid. Default n=0. This command is valid for both characters and Chinese.

FS + Chinese Character with Up-line Print

Format:	ASCII:	FS	+	n
	Decimal:	28	43	n
	Hexadecimal:	1C	2B	n

Explanation:

The specified Chinese characters after this command are printed with up-line. When LSB n=1, up-line selected; when LSB n=0, it canceled.

Remark: Only LSB of n is valid. Default n=0. This command is valid for both characters and Chinese.

ESC “ Hex Mode Print

Format:	ASCII:	ESC	“	n
	Decimal:	27	34	n
	Hexadecimal:	1B	22	n

Explanation:

When LSB n=0, cancel hex mode print; when LSB n=1, hex mode print is valid.

When in hex mode print, all the commands and data the host sent to the printer will be printed in hex codes.

Hex mode print will be carried out only when the print buffer is full.

Notice: only LSB of n is valid, default n=0

4.2.9 Real-time Commands

DLE EOT n Real-time status transmission

Format:	ASCII:	DLE	EOT	n
	Decimal:	16	4	n
	Hexdecimal:	10	04	n

Explanation:

Transmits 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 sensor status

- The printer returns the related status at once upon receiving it.
- This command should not be used within the data sequence of another command that consists of 2 or more bytes.
- The printer transmits the current status. Each status is represented by one byte data.
- The printer transmits the status without confirming whether the host computer can receive data.
- The printer executes this command at once upon receiving it.
- This command is valid only for serial interface printer. The printer will execute this command at once after receiving it, no matter what status the printer is in.

n = 1: Printer status

Bit	0/1	HEX	Decimal	Function
0	0	0	0	Fixed to 0
1	1	2	2	Fixed to 1
2	0	0	0	Fixed to 0
3	0	0	0	On-line
	1	8	8	Off-line
4	1	10	16	Fixed to 1
5,6	-	-	-	Undefined
7	0	0	0	Fixed to 0

n=2: Off-line status

Bit	0/1	HEX	Decimal	Function
0	0	0	0	Fixed to 0
1	1	2	2	Fixed to 1
2	0	0	0	Fixed to 0
3	0	0	0	Non-pressing paper FEED button
	1	8	8	Pressing paper FEED button
4	1	10	16	Fixed to 1
5	0	0	0	Paper exists
	1	20	32	Paper lack
6	0	0	0	No error status
	1	40	64	Error status
7	0	0	0	Fixed to 0

n = 3: Error status

Bit	0/1	HEX	Decimal	Function
0	0	0	0	Fixed to 0
1	1	2	2	Fixed to 1
2	-	-	-	Undefined
3	0	0	0	Fixed to 0
4	1	10	16	Fixed to 1
5	0	0	0	Fixed to 0
6	0	0	0	Printing head with normal temperature
	1	40	64	Printing head with over-heat temperature
7	0	0	0	Fixed to 0

n=4: paper feeding status

Bit	1/0	HEX	Decimal	Function
0	0	0	0	Fixed to 0
1	1	2	2	Fixed to 1
2,3	0	0	0	Fixed to 0
4	1	10	16	Fixed to 1
5,6	0	0	0	Paper exists
	1	60	96	Paper lack
7	0	0	0	Fixed to 0

4.2.10 Bar Code Printing Commands

GS k m d1...dk NUL

Print Barcode

Format:	①ASCII:	GS	k	m	d1...dk	NUL
	Decimal:	29	107	m	d1...dk	0
	Hexadecimal:	1D	6B	m	d1...dk	00
Format:	②ASCII:	GS	k	m	n	d1... dn
	Decimal:	29	107	m	n	d1... dn
	Hexadecimal:	1D	6B	m	n	d1... dn

Explanation:

① $0 \leq m \leq 6$ (the value range of k&d is decided by the barcode type)

② $65 \leq m \leq 73$ (the value range of k&d is decided by the barcode type)

Remark: If the width of barcode is beyond the effective printing width, no characters can be printed, but paper feeds.

m is used to choose the barcode type, showed as below:

m	Barcode type	Character number	d
①	0	UPC-A	$11 \leq k \leq 12$ $48 \leq d \leq 57$
	1	UPC-E	$11 \leq k \leq 12$ $48 \leq d \leq 57$
	2	JAN13 (EAN13)	$12 \leq k \leq 13$ $48 \leq d \leq 57$
	3	JAN 8 (EAN8)	$7 \leq k \leq 8$ $48 \leq d \leq 57$
	4	CODE39	$1 \leq k \leq 255$ $45 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43$
	5	ITF	$1 \leq k \leq 255$ $48 \leq d \leq 57$
	6	CODABAR	$1 \leq k \leq 255$ $48 \leq d \leq 57, 65 \leq d \leq 68, 36, 43, 45, 46, 47, 58$
②	65	UPC-A	$11 \leq n \leq 12$ $48 \leq d \leq 57$
	66	UPC-E	$11 \leq n \leq 12$ $48 \leq d \leq 57$
	67	JAN13 (EAN13)	$12 \leq n \leq 13$ $48 \leq d \leq 57$
	68	JAN 8 (EAN8)	$7 \leq n \leq 8$ $48 \leq d \leq 57$
	69	CODE39	$1 \leq n \leq 255$ $45 \leq d \leq 57, 65 \leq d \leq 90, 32, 36, 37, 43$ $d1 = dk = 42$
	70	ITF	$1 \leq n \leq 255$ $48 \leq d \leq 57$
	71	CODABAR	$1 \leq n \leq 255$ $48 \leq d \leq 57, 65 \leq d \leq 68, 36, 43, 45, 46, 47, 58$
	72	CODE93	$1 \leq n \leq 255$ $0 \leq d \leq 127$
	73	CODE128	$2 \leq n \leq 255$ $0 \leq d \leq 127$

Explanation for command ①:

Character NUL is added at the last to mean that this command is over.

When UPC-A or UPC-E is choosed, after 12bytes barcode data is received, the other characters will be managed as the common characters.

When JAN13 (EAN13) is choosed, after 13bytes barcode data is received, the other characters will be managed as the common characters.

When JAN8 (EAN8) is choosed, after 8bytes barcode data is received, the other characters will be deal with as the common characters.

The numbers of ITF code data must be even number. If odd numbers of barcode data is input, the last one will be ignored.

Explanation for command ②:

n is used to denote the number of barcode data. Printer will deal with the last n bytes data as the barcode data.

If n is beyond the specified range, the printer will not deal with this command and just deal with the data as the common data.

Explanation:

- If barcode data d is beyond the specified range, this command is invalid.
- If the barcode is beyond printing zone at horizontal direction, invalid.
- No matter how much the line height is set by command ESC 1 n, paper feeding length will be same with the barcode height.
- This command is valid only that there is no data in the printing buffer. If there is data in printing buffer, this command will be ignored.
- After printing barcode, the printing position will be set on the first line.
- This command won't be affected by Print Mode Setting (such as bold printing, duplicate printing, underline, character size, reverse white printing, etc), but will be affected by Invert Printing.

When CODE93 (m = 72) is choose:

When printer print HRI character, (■+one alphabet character) is used as one control character (<00>H to <1F>H and <7F>H).

Conversion form between control character and HRI character is as below,

Control character			HRI character	Control character			HRI character
ASCII	Hex	Decimal		ASCII	Hex	Decimal	
NUL	00	0	■ U	DLE	10	16	■ P
SOH	01	1	■ A	DC1	11	17	■ Q
STX	02	2	■ B	DC2	12	18	■ R
ETX	03	3	■ C	DC3	13	19	■ S
EOT	04	4	■ D	DC4	14	20	■ T
ENQ	05	5	■ E	NAK	15	21	■ U
ACK	06	6	■ F	SYN	16	22	■ V
BEL	07	7	■ G	ETB	17	23	■ W
BS	08	8	■ H	CAN	18	24	■ X
HT	09	9	■ I	EM	19	25	■ Y
LF	0A	10	■ J	SUB	1A	26	■ Z
VT	0B	11	■ K	ESC	1B	27	■ A
FF	0C	12	■ L	FS	1C	28	■ B
CR	0D	13	■ M	GS	1D	29	■ C
SO	0E	14	■ N	RS	1E	30	■ D
SI	0F	15	■ O	US	1F	31	■ E
				DEL	7F	127	■ T

When CODE128 (m = 73) is choose:

- Pls refer to Appendix 5 – Related information and characters set of CODE128.
- When CODE128 is used, pls encode according to the below structions:
 1. Do choose characters set (one of CODE A, CODE B and CODE C) before the barcode data.
 2. Choosing characters set is finished through sending character “{” to combine with the other character; ASCII character “{” is finished by sending character “{” twice.

Specified Characters Set	Sending Data		
	ASCII	Hex	Decimal
SHIFT	{S	7B, 53	123,83
CODE A	{A	7B, 41	123, 65
CODE B	{B	7B, 42	123, 66
CODE C	{C	7B, 43	123, 67
FNC1	{1	7B, 31	123, 49
FNC2	{2	7B, 32	123, 50
FNC3	{3	7B, 33	123, 51
FNC4	{4	7B, 34	123, 52
"{"	{{	7B, 7B	123, 123

[Example] : Printing “No. 123456”

In this example, printer will print “No.” by CODE B, and print the other numbers by CODE C:

GS k 73 10 123 66 78 111 46 123 67 12 34 56



- If it is not the choosing of characters set at the beginning of barcode data, the printer will stop dealing with this command and deal with the other data as the common data.
- If the combination by “{” and that following character is not in the above form, the printer will stop dealing with this command and deal with the other data as the common data.
- If the character received by printer is not barcode characters set data, the printer will stop dealing with this command and deal with the other data as the common data.
- When printer prints HRI characters, it doesn't print shift character and choosing data in characters set.
- Function characters in HRI character won't be printed.
- Control characters (<00>H to <1F>H and <7F>H) in HRI character won't be printed.

Pls be sure the space at both left and right side of barcode. The space will be different according to the different barcode.

Pls refer to GS H, GS h, GS w, Appendix 5.

GS H n		Choose printing position of HRI character		
Format:	ASCII:	GS	H	n
	Decimal:	29	72	n
	Hexadecimal:	1D	48	n

Explanation: $0 \leq n \leq 3$, $48 \leq n \leq 51$. When printing barcode, choosing printing position for HRI characters.

n can appoint the printing position of HRI:

n	Printing position
0, 48	Don't print
1, 49	Above barcode
2, 50	Below barcode
3, 51	Both above and below barcode

HRI is note character for barcode content. Default value: n=0.

Pls refer to GS k

Remark: if n is in other value, it is invalid.

GS h n		Set Barcode Height		
Format:	ASCII:	GS	h	n
	Decimal:	29	104	n
	Hexadecimal:	1D	68	n

Explanation: Set the height of printed barcode. n=0~255, unit is dot. If n=0, it is 256dots. Default value n=60.

GS w n		Set Barcode Width		
Format :	ASCII :	GS	w	n

Decimal:	29	119	n
Hexadecimal:	1D	77	n

Explanation: $2 \leq n \leq 6$ (the other value of n is invalid) . Set the horizontal module width of barcode. The detail is as below,

n	Width of single basic module (mm)	Width of double basic module	
		Narrow module (mm)	Wide basic module (mm)
2	0.25	0.25	0.625
3	0.375	0.375	0.875
4	0.5	0.5	1.25
5	0.625	0.625	1.625
6	0.75	0.75	1.875

Single basic module barcode: UPC-A, UPC-E, JAN13 (EAN13), JAN8 (EAN8), CODE93, CODE128

Double basic module barcode: CODE39, ITF, CODABAR

Default value: n = 3. Pls refer to GS k.

Chapter 5 Using and Maintenance

5.1 Printing Head Maintenance

In order to guarantee the normal work of the printer, pls notice that do not disassemble the printing head. If the outer case of printer is not used, pls pay more attention to protect the printing head.

1. If you do not use the printer for a long time, please don't put through the printer on the power.
2. If the printer works abnormally, please turn off the printer power.
3. The used power must meet the requirements, otherwise it will be disadvantageous for the print head.
4. While changing the paper roll, please notice whether there is paper scrap on the print head. If so, please blow gently.
5. Keep the circuit board of the printer clean and dustless.
6. When the thermal printer can't print clearly, the printing head can be wiped by alcohol cotton ball.

5.2 Other

Please also notice the following aspects:

1. Don't insert and pull out the chip. If there is abnormality, please hand over to the producer for repairing.
2. When you suppress to join the electric wire by yourself, pls do pay attention to the interface of printer - parallel interface or serial interface, to avoid the wrong connection with the host computer.

Chapter 6 Printer Using under Windows

The version of printer's driver software is SP-DRV211. The manual for driver software and installation can be downloaded from our website. Do not introduce the details here.

Remark: During installing driver, choose the printer model "58 thermal series". The other details can be checked from Installation Manual.

Appendix 1 Valid Codes Form under ANK printing

The serial numbers of valid codes are from 00H to 0FFH under ANK printing, among which 00H-1FH are control codes and 20H-0FFH are character codes. Character codes are composed by two characters sets. The character codes of each character set are all in 20H-0FFH permutation.

Characters Set 1:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2	!	"	#	\$	%	&	'	()	*	+	,	-	.	/	
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
8	0	一	二	三	四	五	六	七	八	九	十	元	年	月	日	¥
9	£	§	↓	→	∧	±	÷	∞	□	...	°	□	²	³	₂	₃
A	α	β	γ	δ	ε	ζ	η	θ	λ	μ	ν	Ω	ξ	π	ρ	σ
B	τ	Φ	ψ	ω	Γ	∆	Π	Σ	Ψ	Ω	Ξ	Θ	Λ	Φ	Υ	∠
C	[▬	□]	ˉ	-			/	\	┌	└	┌	└	□	×
D	[▬	□]	ˉ	-			/	\	┌	└	┌	└	┌	└
E	┌	└	┌	└	┌	└	┌	└	┌	└	┌	└	┌	└	<	>
F	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	+

Characters Set 2:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
2	百	千	万	Ⅱ	℃	℉	°	¼	⅓	½	¼	⅓	⅔	×	√	⊥	
3	//		∪	∩	⊕	⊖	⊗	⊘	∇	∇	∂	∫	∫	∞	∴		
4	∴	≡	≅	≈	≠	∞	≤	≥	≪	≫	♂	♀	♯	†	%	∴	
5	※	□	()	《 》	『 』	【 】	〰	〰	○	♥	♦	♣					
6	♠	ア	イ	ウ	エ	オ	カ	キ	ク	ケ	コ	サ	シ	ス	セ	ソ	
7	タ	チ	ツ	テ	ト	ナ	ニ	ヌ	ネ	ノ	ハ	ヒ	フ	ヘ	ホ	マ	
8	ミ	ム	メ	モ	ㇿ	⊥	ヨ	ラ	リ	ル	レ	ロ	ワ	ヰ	ヱ	ヲ	
9	ン	ァ	ゥ	ェ	ォ	カ	ユ	ヱ	ヅ	ㇿ	○	Б	Д	Е	Ж	З	
A	И	Й	Л	Ц	Ч	Ш	Щ	Ъ	Ы	Э	Ю	Я	б	с	е	ø	
B	ø	ø	ø	é	á	ä	ä	ä	ä	Š	è	ë	é	ī	ī	ī	Ä
C	Ä	É	æ	Æ	Ô	Ö	Ò	Ù	Û	ÿ	Ö	Ü	⋈	℞	f	ó	
D	í	ó	ù	ñ	Ñ	à	ó	í	ø	ø	é	á	ä	ä	ä	Š	
E	è	ë	é	ī	ī	ī	Ä	Ä	É	æ	Æ	Ô	Ö	Ò	Ù	Û	
F	ÿ	Ö	Ü	⋈	℞	f	ó	í	ø	ø	é	á	ä	ä	ä	Š	

Appendix 2 Valid Codes Form under Chinese printing

The serial numbers of valid codes are from 00H to 0FFH under Chinese printing, among which 00H-1FH are control codes and 20H-0FFH are character codes.

HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
2		!	"	#	\$	%	&	'	()	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[\]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{		}	~	
8	€	ü	é	â	ä	à	â	ç	ê	ë	è	ï	î	ì	Ä	Å
9	É	Æ	FE	ô	ö	ò	û	ù	ÿ	Ö	Ü	¢	£	¥	₪	f
A	á	í	ó	ú	ñ	Ñ	ã	º	¿	Γ	γ	½	¼	ı	《	》
B	⋮	⋮	⋮		†	‡	‡	π	π	‡	‡	π	π	π	π	π
C	L	⊥	⊥	†	—	†	‡	‡	⊥	⊥	⊥	⊥	⊥	=	‡	±
D	⊥	⊥	π	⊥	⊥	F	π	‡	‡	J	Γ	■	■	■	■	■
E	α	β	Γ	π	Σ	σ	μ	τ	Φ	θ	Ω	δ	∞	φ	∈	∩
F	≡	±	≥	≤	[]	÷	≈	°	•	-	√	n	²	■	

Appendix 3 Printing Commands Form

Decimal	Hexadecimal	Symbol&Format	Function	Page
0	0	NUL	Ending Mark	29
9	9	HT	Levels of clock	18
10	0A	LF	Line Feed	15
11	0B	VT	Perform Vertical Tabulation	17
13	0D	CR	Enter	29
16 4 n	10 04 n	DLE EOT n	Real-time status transmission	32
27 34 n	1B 22 n	ESC " n	Hex Mode Print	32
27 37 n	1B 25 n	ESC % m1 n1.....mk nk 00	Replace User-defined Character	26
27 38	1B 26	ESC & m n1 n2.....n6	User Define Character	25
27 39	1B 27	ESC' m ...nL nIH CR	Print M Curve dots (dashed)	28
27 43 n	1B 2B n	ESC + n	Select/prohibit Up-line Print	23
27 44	1B 2C	ESC , m...nL nIH CR	Print M Curve dots (full line)	28
27 45 n	1B 2D n	ESC - n	Select/cancel Underline Print	23
27 49 n	1B 31 n	ESC 1 n	Set n Dot-line Spacing	16
27 54	1B 36	ESC 6	Choose Characters Set 1	25
27 55	1B 37	ESC 7	Choose Characters Set 2	25
27 58	1B 3A	ESC :	Recover Character in Character Set	26
27 64	1B 40	ESC @	Initialize Printer	28
27 66	1B 42	ESC B n1...nkNUL	Set Vertical Tab Value	17
27 68	1B 44	ESC D n1...nk NUL	Set Horizontal Tab Value	18

27 74 n	1B 4A n	ESC J n	n Dot Line Feed	15
27 75	1B 4B	ESC K n1...n2...data	Print bit-map graphics	27
27 81 n	1B 51 n	ESC Q n	Set Right Margin	20
27 85 n	1B 55 n	ESC U n	Enlarge Width	21
27 86 n	1B 56 n	ESC V n	Enlarge Height	21
27 87 n	1B 57 n	ESC W n	Enlarge Width and Height	22
27 99 n	1B 63 n	ESC C n	Select/prohibit Reverse Print	24
27 102 m n	1B 66 m n	ESC f m n	Print Blank Characters or Lines	19
27 105 n	1B 69 n	ESC i n	Select/prohibit Reverse White Print	24
27 108 n	1B 6C n	ESC l n	Set Left Margin	19
27 112 n	1B 70 n	ESC P n	Set Character Space	21
27 116 n	1B 74 n	ESC t n	Choose Codepage	26
28 14 n	1C 0E n	FS SO n	Set Chinese Double Width Print	30
28 20	1C 14	FS DC 4	Cancel Chinese Double Width Print	30
28 38	1C 26	FS &	Select Chinese Print Mode	29
28 43 n	1C 2B n	FS + n	Chinese Character with Up-line Print	31
28 45 n	1C 2D n	FS - n	Chinese Character with Underline Print	31
28 46	1C 2E	FS ·	Cancel Chinese Print Mode	30
28 73 n	1C 49 n	FS l n	Set Chinese Character Rotational Print	31
28 74	1C 4A	FS J	Set Vertical Print	30
28 75	1C 4B	FS K	Set Horizontal Print	31
28 80 n	1C 50 n	FS P n	Print Pre-saved Bitmap	25
28 87 n	1C 57 n	FS W n	Set the Enlarging Multiple of Chinese Character	30

29 72 n	1D 48 n	GS H n	Choose printing position of HRI character	37
29 104 n	1D 68 n	GS h n	Set Barcode Height	37
29 107 n	1D 6B n	GS k n	Print Barcode	34
29 119 n	1D 77 n	GS w n	Set Barcode Width	38