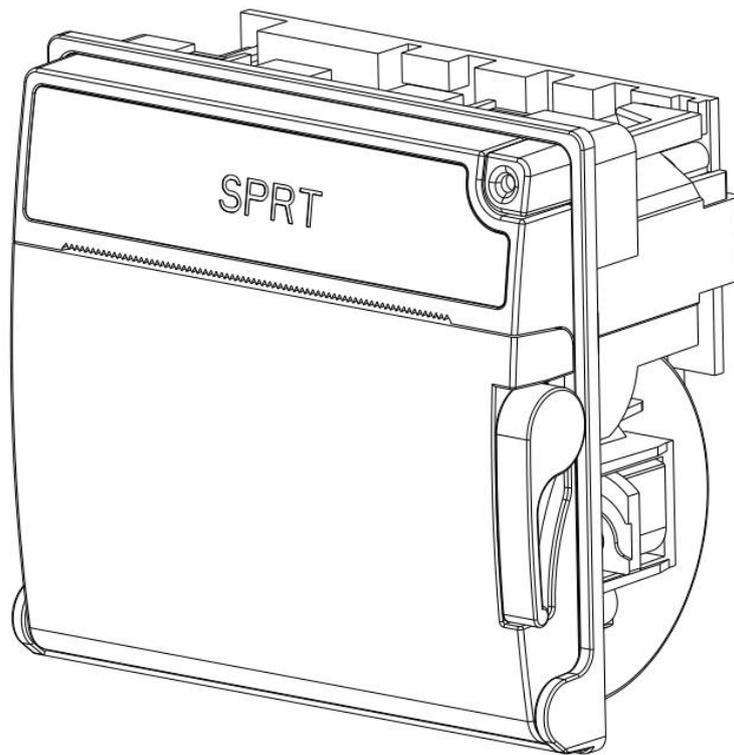


SPRT®

SP-RMD15 Thermal Micro Panel Printer User's Manual

(Ver1.04)



Beijing Spirit Technology Development Co., Ltd

www.sprt-printer.com

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Introduction

SP-RMD15 thermal printer is a intelligent dot printer which manufactured by SPRT in 21th century. The machine adopt new imported clock mechanism with computer single chip, with advantages of small volume, light weight, complete functions, fast speed, high definition, artistic appearance, simple operation, convenient connection. It is the most ideal matching product to use in medical equipment, fire-alarm control and other kinds of equipment, etc.

SP-RMD15 thermal printer has the same characters set 1 and 2 as SP-RMDIII under ASCII printing. Under Chinese printing, it can 24 dot matrix high, 12*24 half-width character or 16 dot matrix high, 8*16 half-width character according to Chinese character dot matrix. National standard one or two level font database, lots of mathematical and special symbols, graphs, curves can be chosen. The printed line spacing and characters can be changed through commands. Part of the code characters can be customized. It also has self test function

RMD15 printer can work with Windows driver. It can print kinds of characters, Chinese and pictures directly through PC.

Chapter 1 Feature and Performance

1.1 Features

- ◇ Thermal line printing
- ◇ Printing head and circuit together to be convenient for installation.
- ◇ With single chip processor. There is standard parallel interface or serial interface, which is convenient to connect with kinds of microcomputers or intelligent equipment.
- ◇ There is actual time printing command to print Characters, code, graphics, etc. The commands set is compatible with the traditional printer.
- ◇ Support kinds of codepages and pre-saved bitmap printing.
- ◇ Self-testing function. All codes can be printed, characters with high definition and beauty,
- ◇ enough receiving buffer 3K
- ◇ Printing paper: Width 57.5 ± 0.5 mm thermal paper
- ◇ Paper type: $57.5 \times \varnothing 30$ mm (MAX)
- ◇ Power request:

RMD15 S/TH Voltage Input: DC5V~9V Current: 3A

RMD15 VS/VTH Voltage Input: DC9V~24V Current: 3A

- ◇ Operating temperature: 0~50°C
- ◇ Can be used in DOS and Windows
- ◇ 8dots/mm, 384dots/line
- ◇ printing speed: 80mm / s
- ◇ TPH: 50KM
- ◇ Installation size: 76.5mm×72.5mm (W×H) Depth:32mm
- ◇ Outline dimension: 80mm×75mm×45mm (W×H×D)

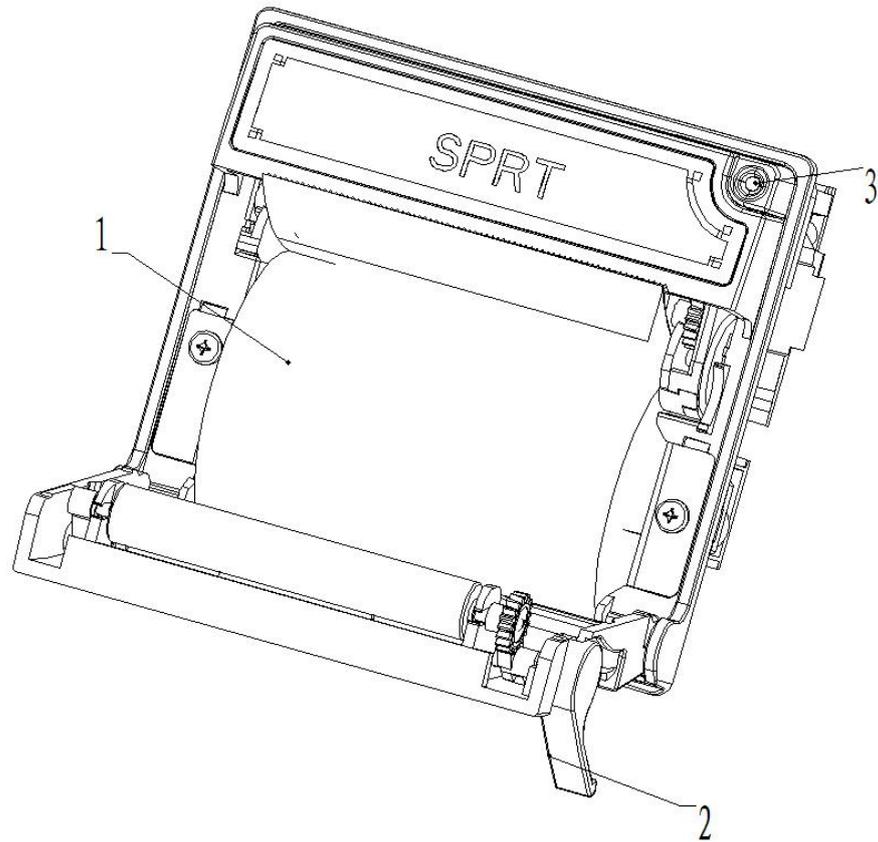
1.2 Performance

- ◇ Printing method: thermal dots printing

- ◇ Interface: Serial (RS-232, TTL)
- ◇ Interface connector: Serial interface: 6PIN single row serial interface plug socket
- ◇ Universal ESC, FS, GS control code
- ◇ LF button is controlling button for self-test and paper feeding. LF indicator is indicator for error alarm and power. Different flickering frequency of indicator has different meanings. About detailed, pls ref. chapter3.2.
- ◇ Printing paper: thermal paper, Paper width $57.5 \pm 0.5 \text{mm}$
- ◇ Reliability: MCBF (Mean Cycles Between Failure) $(5 \sim 15) \times 10^6$
- ◇ Operating temperature: $0 \sim 50^\circ\text{C}$, $10 \sim 80\%$
- ◇ Storage temperature: $-20 \sim 60^\circ\text{C}$, $10 \sim 90\%$

Chapter 2 Printer Installation

2.1 Printer outline



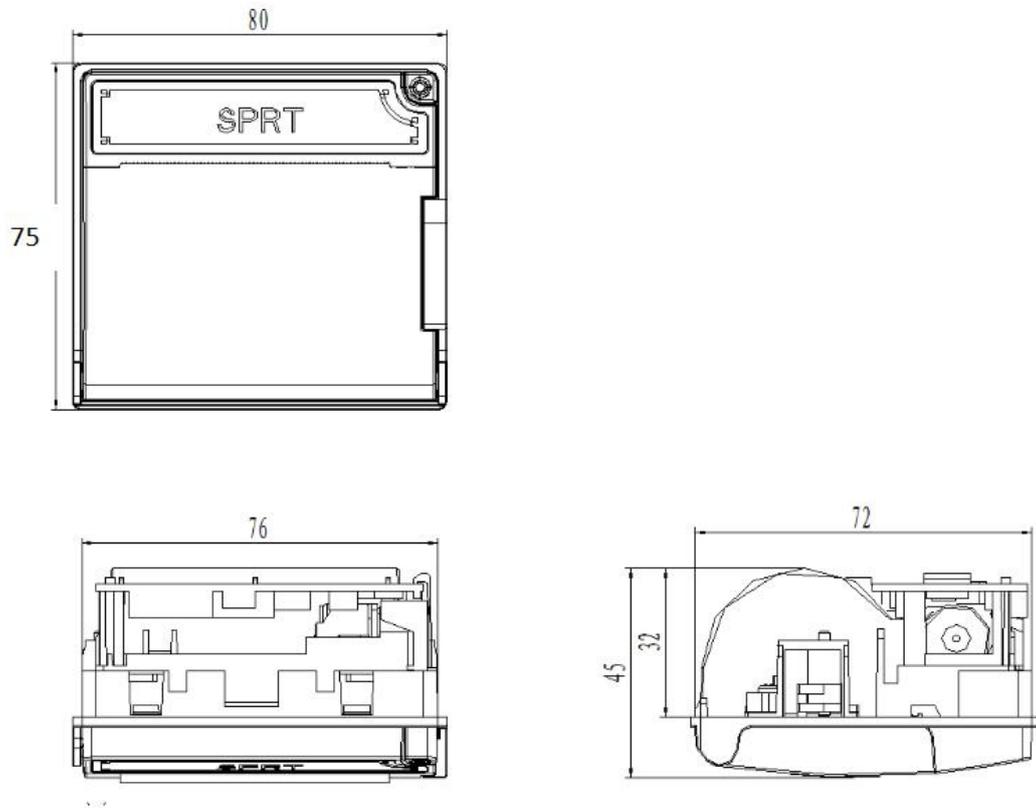
Picture 2—1

1, Paper roll

2, Open Handle

3, LF button and indicator light of power and status

2.2 Outline dimension



Picture 2—2 Outline & Opening dimension of D15

2.3 Paper loading

Pull the hand shank to open the paper case cover. Close the cover after loading the paper.

Chapter 3 Operating Instruction

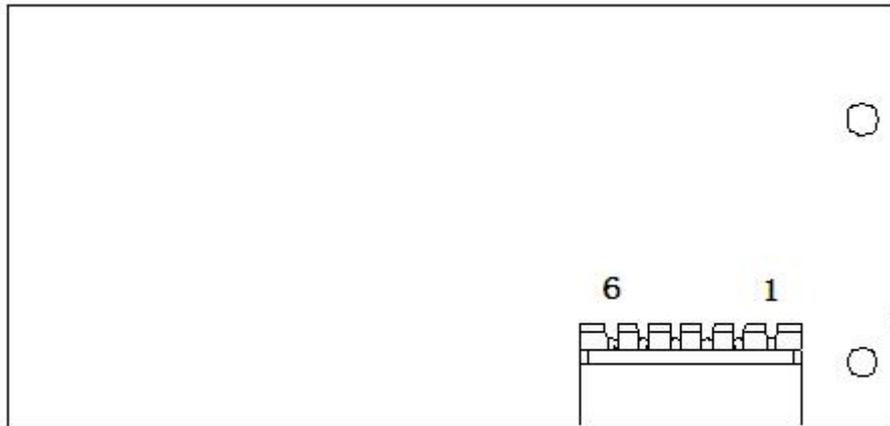
3.1 Interface Connection

3.1.1 Serial Interface and Power Connection

RMD15 serial interface type is RS232

1, RS-232 interface

The electrical level of RS232 interface is EIA or TTL, which is distinguished by optional resistance. RTS/CTS and XON/XOFF handshaking protocols are supported. The interface type is 6pin single row plug socket. The pin order of serial port is showed in below Picture3.1:



Picture 3—1

The definition of each pin for serial interface is as below:

Signal name	Pin No. of 6PIN Plug Socket	Source	Explanation
RXD	3	Host	Printer receive data from host
TXD	5	Printer	Printer send data to host. When X-ON/X-OFF handshaking protocol is used, printer send Control code X-ON/X-OFF to host.

CTS	4	Printer	When data is MARK, it means printer is too busy to receive data; when data is SPACE, it means printer is ready to receive data.
RTS	2	Host	When data is MARK, it means host is too busy to receive data; when data is SPACE, it means host is ready to receive data.
GND	6	Signal ground	
VIN	1	Power input	

Table 3-1 Pin Definition of Serial Interface

Notice: ① "Source" means the source data comes from.

② During serial interface, baud rate and data structure can be set through Setting Tool software. Default factory setting is 9600bps, 8bits data bit, no parity and 1bit stop bit. There are two handshaking modes optional: One is Mark Control Handshake, the other is X-ON/X-OFF Protocol Handshake. The explanation of these two kinds is as showed in

Table 3-2:

Handshaking Mode	Data Direction	RS-232C interface signal
Mark Control	data can enter	Signal Line 1&8 is in "Space" status
	data can't enter	Signal Line 1&8 is in "Mark" status
X-ON/ X-OFF Control	data can enter	Send X-ON code "11H" on signal line 2
	data can't enter	Send X-OFF code "13H" on signal line 2

Table 3—2 Two Handshaking Modes

3.1.2 USB Interface



Mini USB B Connector Pin Definition:

Pin	Signal
1	NC
2	D-
3	D+
4	NC
5	GND

3.1.3 Printer Parameters Setting

The printer parameters can be set by two methods:

1, Set by software

Setting Tool software can be requested from company.

2, Set by combination of SET button (in the back of printer) and LF button.

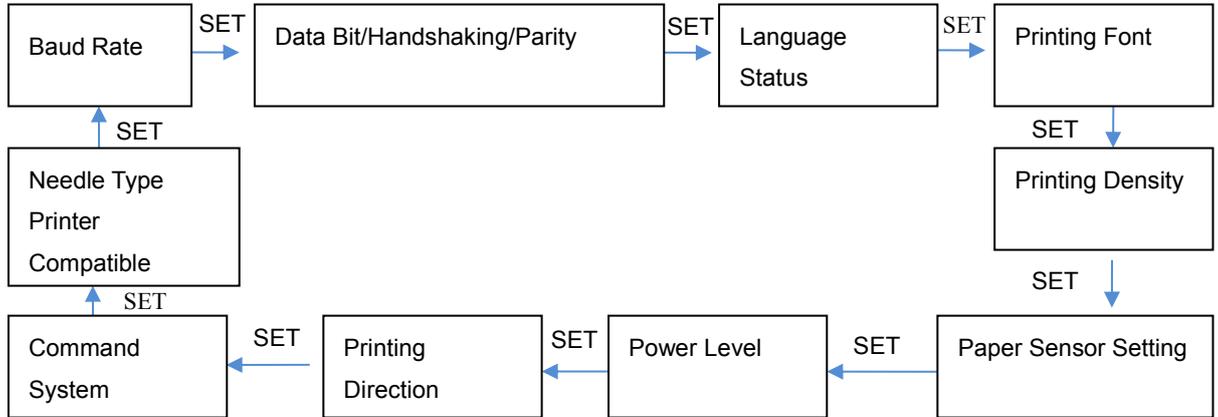
Enter Parameters Setting: Keep pressing **【SET】** button and power on the printer, then the green indicator light will flicker once one second. Release **【SET】** button within three times of light flickering. The printer will enter SETTING status. Choosing setting items by **【SET】** button. The setting item will go to the next and the current setting value will be printed after pressing **【SET】** button each. Choosing the value of setting item by **【LF】** button. The value will go to the next after pressing **【LF】** button each.

Quit Parameters Setting: Keep pressing **【SET】** button, then release after the indicator light flickers three times. The message "Exit Set Mode" will be printed. The set parameters are saved. And the printer quits the setting mode and enters the normal

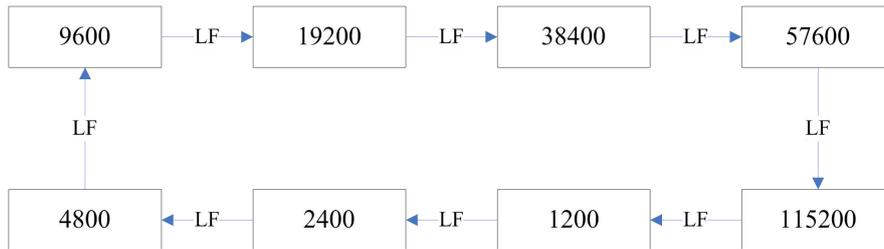
working mode. If power off the printer directly, the set values will not be saved.

General Setting:

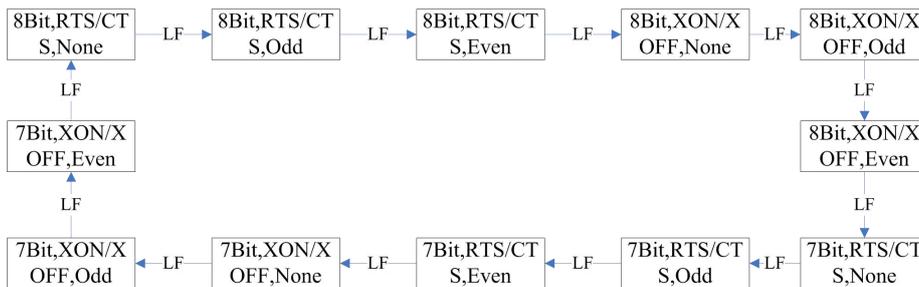
1,



1. Baud Rate:



2, Data bit / Handshaking / Parity:



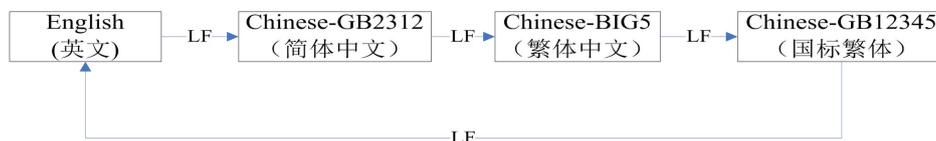
Explanation:

Data Bit: 8bit or 7bit

Handshaking: RTS/CTS or XON/XOFF

Parity: None or Odd or Even

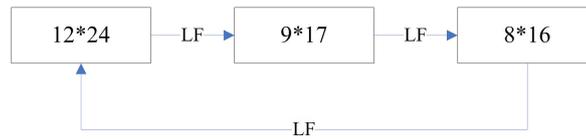
3, Language Status:



Explanation:

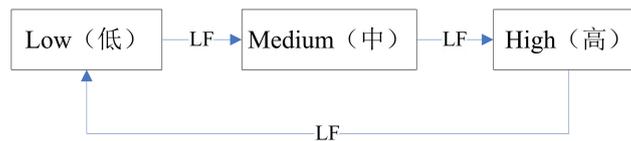
1. GB12345 is Traditional Chinese Characters Set corresponding with GB2312.
2. Standard 24dots model only support GB2312 mode; 16dots model can support BIG5 and GB12345.

4, Printing Font:

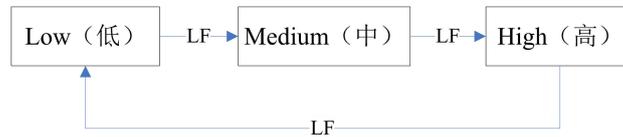


Explanation: The above font is only valid under Chinese mode. Under English mode, there is only one font 6*8.

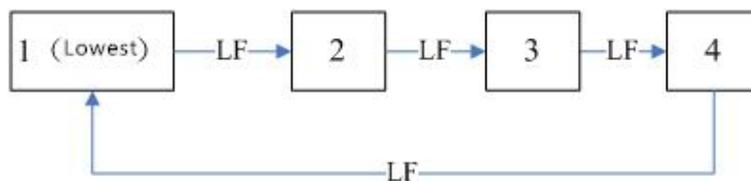
5, Printing Density:



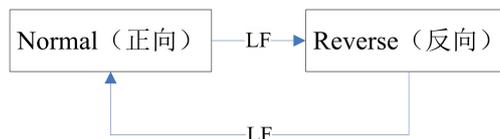
6, Paper Sensor Setting:



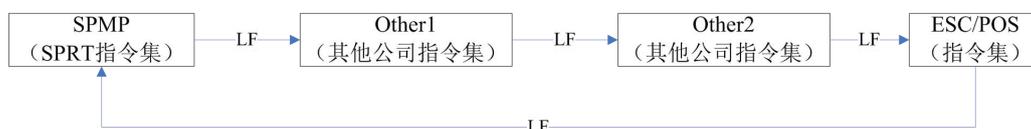
7, Power Level:



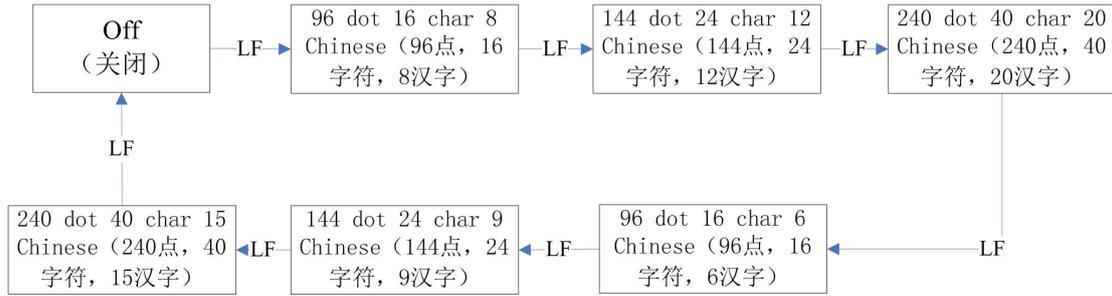
8, Printing Direction:



9, Command System:



10, Impact Dot Matrix Type Printer Compatible:



Impact Dot Matrix Type printer compatible function can be set by this:

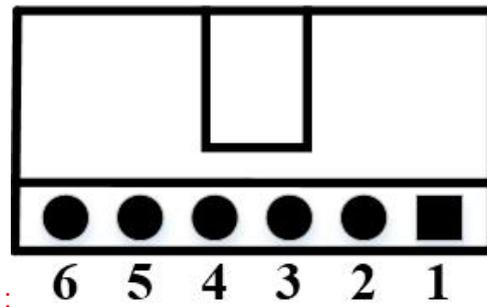
1. After setting this, power level still can be chose.
2. After choosing the Impact Dot Matrix Type Printer Compatible, Characters and Font size can't be supported to be chosen.

3.1.5 Power Connector

RMD15 S/TH Power Input: DC5V~9V Current: 3A

RMD15 VS/VTH Power Input: DC9V~24V Current: 3A

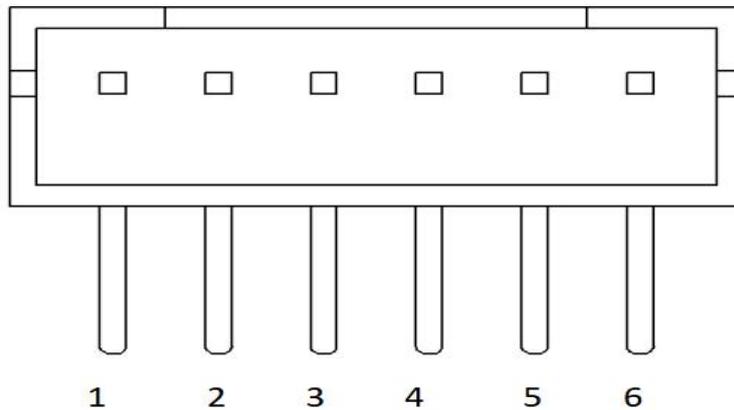
2.54mm Spacing Power Interface Socket Socket As shown in Pic. 3-2, 2.54mm PowerSource Interface Pin Line Description, shown in Chart 3-3, 2.00mm Spacted power interface socket, shown in Pic. 3-3, 2.00mm pitch power supply Interface pin line order Description Chart 3-4



Pic. 3-2 power socket interface

Pin No.	Pin Definition	Instruction
1	VIN	Power input
2	RTS	Request sending
3	RXD	Data receiving
4	CTS	Clear to send
5	TXD	Data transmitting
6	GND	Ground wire

Chart 3-3 power interface sequential pin whose spacing is 2.54mm



Pic. 3-3 power socket interface

Pin No.	Pin Definition	Instruction
1	VCC	Power input
2	NC	NC
3	VIN	Power input
4	RXD	Data receiving
5	TXD	Data transmitting
6	GND	Groud wire

Chart 3-4 power interface sequential pin whose spacing is 2.00mm

3.2 Indicator and button

The function of buttons will be different according to the different working mode of printer. During Setting mode functions, pls check 3.1.4. Under normal working mode, it is as below:

SET button

This button is on the side of printer, next to the interface. Keep pressing **【SET】** button during power on the printer to enter Setting Mode. If only power on the printer normally, this button is invalid.

LF

When printer is power on, after pressing **【LF】** button, it starts to feed paper. Release button to stop paper feeding.

The indicator for power and error is the same one. (Green)

Indicator status	Explanation
Persistent lighting	power on
Flicker once per second	Lack of paper. Recover to be normal after paper loading.
Flicker twice per second	Printing head over-heat. Recover automatically after the temperature of printing head falling.
Flicker three times per second	The heating plate of printing head break downed. Unrecoverable. At this time, the printer needs to be repaired.

Note: When the printer is in BUSY status, the indicator will be out.

3.3 Self-test and Hex printing

Self-test can test whether the printer is normal working or not. If the self-test receipt can be printed out correctly, it means the printer can work normally except the interface with host. Otherwise, the printer needs to be repaired.

Self-test receipt sample:

The content printed on self-test receipt is Version No., Interface, Character and other configuration information.

The self-test receipt sample is as below:



figure 3—4 Self-test receipt sample

figure 3—4 is the self-test receipt of Serial interface model. Print sequence is from down to up. Due to the self-test content shown in English, please refer to the Chinese translation of the key setting parameters as below.

No.	Self-test contents	Self-test Chinese explain
1	Version: M-007 1.01	版本号: M-007 1.01
2	Model: RM	机型: RM
3	Interface: RS232 (EIA) Interface: RS232 (TTL)	接口类型: RS232串口 接口类型: RS232串口
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	汉字字体: 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	Movement: TP20	机头: TP205
15	Default Codepage: No	默认代码页: 无

Note:

1. Due to the possible different default configuration items, the font and configuration value may be different. The above picture is just for reference.

2. The content of each item can refer to the content of Chapter 3.1.4. After setting manually each time, whether the setting is successfully or not can be checked from the printed receipt.

The method of self-test is holding down 【LF】 button and turn on the printer. Then within three seconds, loosen the button. At this time, the printer will print out self-test receipt.

The method of hex printing is holding down 【LF】 button and turn on the printer. The green indicator light will flicker once one second. After the indicator flickers three times, release the button. The green indicator light will still flicker three times, and then stop. The printer will print out “Hexadecimal Dump” and enters into Hex printing mode.

3.4 Pinter Initialization

There are two methods of printer initialization. One is that through the control code ESC @, the host sends commands to printer to initialize printer by commands. The other is restarting the printer.

Chapter 4 Printing commands

4.1 Summary

All the printing commands of RMD15 are fully compatible with traditional ESC printing commands. The description form of each command is as following,

<u>Command name</u>	<u>Function</u>
Format: ASCII:	the standard ASCII character sequence
Decimal:	the Decimal number sequence
<u> Hexadecimal: </u>	<u>the Hexadecimal number sequence</u>

Explanation: the function of command and usage method

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

<u>LF</u>	<u>Feed Line</u>
Format: ASCII:	LF
Decimal:	10
<u> Hexadecimal: </u>	<u>0A</u>

Explanation: The printer prints the current line and feeds paper forwards one line.

Remark: One line means the current character line.

<u>ESC J</u>	<u>n Dot Line Feed</u>
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 later feed line command.

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

Line spacing will be enlarged 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 n dot-line spacing is set for future Line Feed command. n=0~255

Default setting n=3 for text printing, n=0 for bitmap printing when using ESC K command.

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

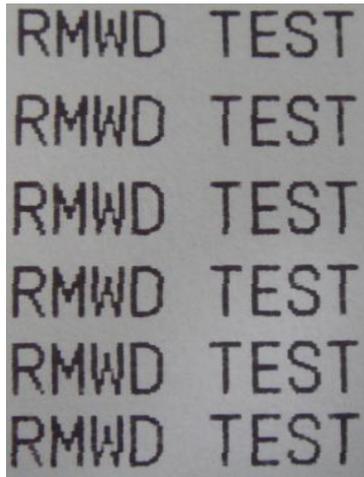
```
FOR I=1 TO 11 STEP 2
```

```
LPRINT 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 above 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. Character NUL is added at the end to indicate that the command is over.

VT command is to carry out vertical tab and the paper is fed to the next vertical position. All input vertical tab positions 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

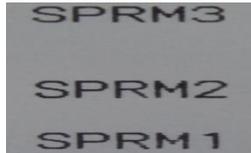
The BASIC programs about the above example are as below:

LPRINT CHR\$(27); CHR\$(66);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 character string

The print result of the above program 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).

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 horizontal tab positions are entered as n1, n2 and so on, all of which should be within the line width of this model printer. Character NUL is added at the end to indicate that the command is over.

All set horizontal tab positions 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,

ASCII: ESC D STX HT SO NUL

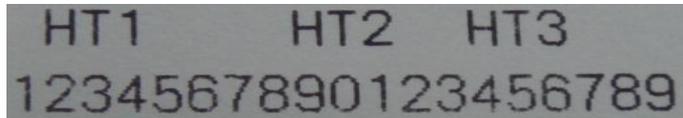
Decimal: 27 68 2 9 14 0

Hexadecimal: 1B 44 02 09 0E 00

The BASIC programs for this example are as below:

```
LPRINT "1234567890123456789"           'Ruler
LPRINT CHR$(27); CHR$(68);CHR$(2);CHR$(9);CHR$(14); CHR$(0);'ESC D command
LPRINT CHR$(9);                         'HT command
LPRIN "HT1";                             'print character string
LPRINT CHR$(9);                         'HT command
LPRINT "HT2";                           'print character string
LPRINT CHR$(9);                         'HT command
LPRINT "HT3";                           'print character string
LPRINT CHR$(13);
```

The print result of the above program is as following:



```
HT1      HT2      HT3
1234567890123456789
```

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.

Remark: 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. If the horizontal tab position is beyond the current line width, HT command won't be carried out, either.

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

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

Remark:

When m=0, if the value of n is beyond the current line width, the printer will continue to print blank in the next line.

When m=1, paper will feed n current line heights.

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	ACK
Decimal:	27	102	01	6
Hexadecimal:	1B	66	01	06

ESC I Set Left Margin

Format:	ASCII:	ESC	I	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 commands ESC U and ESC W.

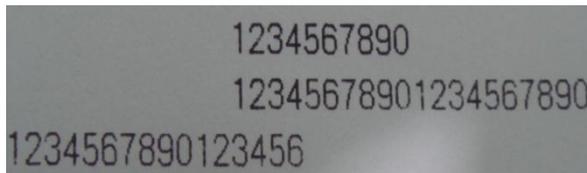
Example: set left margin value to 12, you can send the following commands:

ASCII:	ESC	1	FF
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 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.

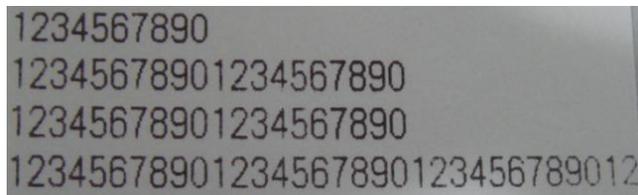
Example: set right margin value to 12, you can send the following commands:

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$(27); CHR$(81);CHR$(12); 'ESC Q command
LPRINT "123456789012345678901234567890";
LPRINT "12345678901234567890"
```

The print result is as following:



ESC P Set Character Space

Format:	ASCII:	ESC	P	n
	Decimal:	27	112	n
	Hexadecimal:	1B	70	n

Explanation:

This command is used to set space dot between characters, which is also valid for Chinese characters.

Default n=0, means no space between characters. (dot is absolute value and won't be influenced by enlarging or narrow commands), n=0~255

4.2.3 Character Setting Commands

ESC U Enlarge Width

Format:	ASCII:	ESC	U	n
	Decimal:	27	85	n
	Hexadecimal:	1B	55	n

Explanation:

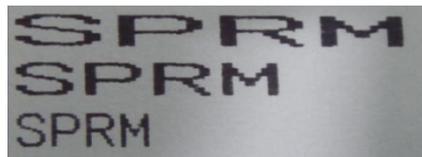
After inputting this command, the characters, graphics and Chinese characters are printed at n times of normal width, n=1 ~ 8. Default n=1 when the dots are 24, while default n=2 when the dots are 16. These are normal printing width.

Remark: n=1~8, the other value of n will be invalid.

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

```
FOR I=1 TO 3
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:



ESC V Enlarge Height

Format:	ASCII:	ESC	V	n
	Decimal:	27	86	n
	Hexadecimal:	1B	56	n

Explanation:

After inputting this command, the characters, graphics and Chinese characters are printed at n times of normal height, n=1 ~ 8. Default n=1 when the dots are 24, while default n=2 when the dots are 16. This command should be sent out at the beginning of one line.

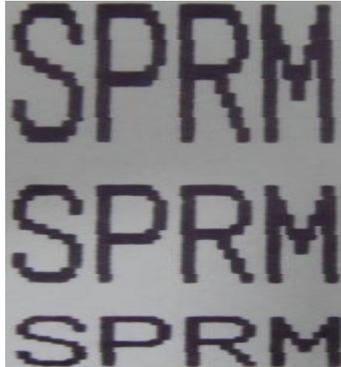
Remark: n=1~8, the other value of n will be invalid.

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:



<u>ESC W</u>		<u>Enlarge Width and Height</u>		
Format:	ASCII::	ESC	W	n
	Decimal:	27	87	n
	Hexadecimal:	1B	57	n

Explanation:

After inputting this command, the characters, graphics and Chinese characters are printed at n times of normal width and height, n=1~8.

Remark: n=1~8, the other value of n will be invalid.

```
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 Underline Print

Format:	ASCII:	ESC	-	n
	Decimal:	27	45	n
	Hexadecimal:	1B	2D	n

Explanation:

When the lowest dot n=1, select underline print; when the lowest dot n=0, cancel underline print.

All characters including spaces will be printed out with underline after selecting underline print command, unless cancel the underline print command. This command is also valid for Chinese characters.

Remark: Only the lowest dot of n is valid. Default n=0.

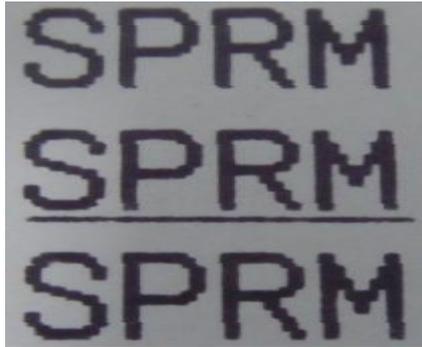
The BASIC programs for observing the effect of this command are as below:

```
LPRINT CHR$(27); CHR$(57); CHR$(2);      ' Enlarge the width and height twice
LPRINT "SPRM"

LPRINT CHR$(27); CHR$(45); CHR$(1);      ' Select underline
LPRINT "SPRM"                             'SPRM print underline

LPRINT CHR$(27); CHR$(45); CHR$(0);      'Forbid underline
LPRINT "SPRM"
```

The print result is as following:



ESC + Select/prohibit Up-line Print

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

Explanation:

When the lowest dot n=1, select up-line print; when the lowest dot n=0, prohibit up-line print.

All characters including spaces will be printed out with up-line after selecting up-line print, unless prohibit the up-line print command. This command is also valid for Chinese characters.

Remark: Only the lowest dot of n is valid. Default n=0.

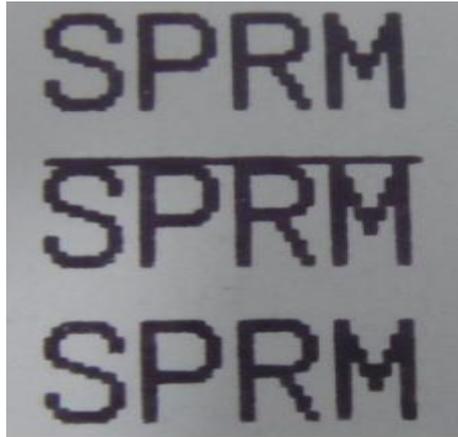
The BASIC programs for observing the effect of this command are as below:

```
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
LPRINT "SPRM"                            'SPRM print under-line

LPRINT CHR$(27); CHR$(45); CHR$(0);      ' Cancel up-line print
LPRINT "SPRM"
```

The print result is as following:



ESC i Select/prohibit Reverse White Print

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

Explanation:

When the lowest dot n=1, select reverse white print; when the lowest dot n=0, prohibit reverse white print. Reverse white print is printing in the black background, just like the film of photography. The normal printing is that printing black characters in white background. The default is prohibiting reverse white print.

Remark: Only the lowest dot of n is valid. Default n=0.

The BASIC programs are as below:

```
LPRINT CHR$(27); CHR$(105); CHR$(1), ' Select reverse white print
LPRINT "SPRM"
```

The print result is as following:



ESC c Select/prohibit Reverse Print

Format:	ASCII:	ESC	c	n
	Decimal:	27	99	n

Hexadecimal: 1B 63 n

Explanation:

When the lowest dot n=1, select reverse print; when the lowest dot n=0, prohibit reverse print.

Remark: Only the lowest dot of n is valid. Default n=1.

Notice: Reverse print not only supports character mode but also supports graphics mode and Chinese character mode. When print the graphics in reverse direction, pay attention to the printing sequence of graphic units, please check 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

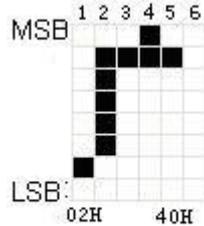
ESC & User Define Character

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 top 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

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 dot matrix graphics

Format:	ASCII:	ESC	K	n1	n2....data.....
	Decimal:	27	75	n1	n2....data.....

Hexadecimal: 1B 4B n1 n2....data.....

Explanation:

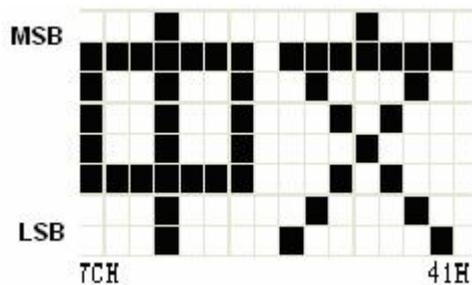
This command is used to print $(n_2 \times 256 + n_1) \times 8$ dot matrix graphics. The width of this graphics is $(n_2 \times 256 + n_1)$ dots and the height is 8 dots. Each column has 8 dots and can be presented by a 8-bit byte, the MSB is on the top.

The values of n_1 , n_2 denote a 16-bit binary data, n_1 is LSB, n_2 is MSB, to mean that the width of printed dot matrix graphics through ESC K command is $n_2 \times 256 + n_1$. In our printer series, $n_2 = 0/1$. 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 $n_2 \times 256 + n_1$.

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 $n_1 = 15$, $n_2 = 0$, the 15-byte data showed in hexadecimal are as follows:

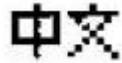
7C, 44, 44, FF, 44, 44, 7C, 00, 41, 62, 54, C8, 54, 62, 41



The BASIC programs for 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$(&H00)
LPRINT CHR$(&H41); CHR$(&H62); CHR$(&H54); CHR$(&HC8)
LPRINT CHR$(&H54); CHR$(&H62); CHR$(&H41);
LPRINT CHR$(10); CHR$(13);                 'enter to print text of current line
```

The print result is as following:



ESC ' Print Curve I

Format: ASCII: ESC 'mL mH n1L n1H n2L n2H.....nIL nIH CR

Decimal: 27 39 mL mH n1L n1H n2L n2H.....nIL nlh 13

Hexadecimal: 1B 27 mL mH n1L n1H n2L n2H.....nIL nlh OD

Explanation:

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

There are m dots of curve in one horizontal line. n1L n1H n2L n2H.....nIL nIH presents the positions of these m curves. The numbers of nIL or nIH 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.....nIL nIH 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.

ESC , Print Curve II (supplement dots automatically to be full curve)

Format: ASCII: ESC , m n1L n1H n2L n2H.....nIL nIH CR

Decimal: 27 44 m n1L n1H n2L n2H.....nIL nlh 13

Hexadecimal: 1B 2C m n1L n1H n2L n2H.....nIL nlh 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:

$0 \leq n \leq 2$, 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 Code page

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

Explanation:

$0 \leq n \leq 45$, when n is 0xFE, cancel choosing code page. The character will be printed out according to Code page Table in Appendix 2. Default n=0xFE, which means no code page is choose.

Choose code page on n page from the following Code page 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 Cyrillic #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 Europe]
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,

Notice: n=1~8, the other value is invalid

FS J Set Vertical Print

Format: ASCII:	FS	J
Decimal:	28	74
Hexadecimal:	1C	4A

Explanation:

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

FS K Set Horizontal Print

Format: ASCII:	FS	K
Decimal:	28	75
Hexadecimal:	1C	4B

Explanation:

This command is to print characters horizontally, if have not set rotation, the

characters will be printed horizontally, that is normal print status.

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

Explanation:

This command is to rotate 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
Hexadecimal:	10	04	n

Explanation:

Transmits the selected printer status specified by n ($1 \leq n \leq 4$) 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 exits
	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...d k NUL
 Decimal: 29 107 m d1...dk 0
 Hexadecimal: 1D 6B m d1...dk 00
 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 chose, after 12bytes barcode data is received, the other characters will be managed as the common characters.

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

When JAN8 (EAN8) is chose, 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 instructions:
 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	Width of double basic module	
	basic module	Narrow basic	Wide basic module
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 RMD15 printers' 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	ˆ	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	Π	℃	℉	-¹	¼	¼	½	⅓	¼	∓	×	√	⊥	
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	ヅ	ヅ	ラ	リ	ル	レ	ロ	ワ	ヰ	ヱ	ヱ	ヱ	
9	ン	ァ	ゥ	ェ	ォ	ヵ	ヱ	ヱ	ヱ	〃	〇	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	ä	ä	ä	ä	ä	ä	ä	ä
C	À	É	æ	Æ	Ô	Ö	Ô	Û	Û	Û	Û	Û	Û	Û	Û	Û	
D	í	ó	ù	ñ	Ñ	ä	ä	ä	ä	ä	ä	ä	ä	ä	ä	ä	
E	ê	ë	é	í	í	í	Á	Á	É	æ	Æ	Ô	Ö	Ô	Û	Û	
F	ÿ	Ö	Û	♠	♣	f	ó	í	ó	ù	ñ	Ñ	ä	ä	ä	ä	

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.

十六进制	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	å	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	ª	º	¿	Γ	γ	½	¼	¡	«	»
B					†	‡	‡	π	ƒ	‡		⌈	⌋	⌋	⌋	⌋
C	L	⊥	⊥	†	—	+	†		ℓ	ℓ	⊥	⌈	⌋	=	⌈	⊥
D	⊥	⊥	π	ℓ	ℓ	F	π	‡	‡	J	Γ	■	■	■	■	■
E	α	β	Γ	π	Σ	σ	μ	τ	Φ	θ	Ω	δ	∞	φ	∈	∩
F	≡	±	≥	≤	∫	J	÷	≈	◦	•	—	√	n	2	■	

Appendix 3 Printing Commands Form

Decimal	Hexadecimal	Symbol&Format	Function	Page
0	0	NUL	Ending Mark	29
9	9	HT	FEED LINE	18
10	0A	LF	Carriage Return	15
11	0B	VT	Real-time transmission status	17
13	0D	CR	Hex Mode Print	29
16 4 n	10 04 n	DLE EOT n	Replace User-defined Character	32
27 34 n	1B 22 n	ESC " n	User Define Character	32
27 37 n	1B 25 n	ESC % m1 n1.....mk nk 00	Real-time transmission status	26
27 38	1B 26	ESC &m n1 n2.....n6	Hex Mode Print	25
27 39	1B 27	ESC' m ...nIL 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...nIL 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 67 n	1B 43 n	ESC C n	Set Horizontal Tab Value	16
27 68	1B 44	ESC D n1...nk NUL	n Dot Line Feed	18
27 74 n	1B 4A n	ESC J n	Print bit-map graphics	15

27 75	1B 4B	ESC K n1...n2...data	Set Right Margin	27
27 81 n	1B 51 n	ESC Q n	Enlarge Width	20
27 85 n	1B 55 n	ESC U n	Enlarge Height	21
27 86 n	1B 56 n	ESC V n	Enlarge Width and Height	21
27 87 n	1B 57 n	ESC W n	Select/prohibit Reverse Print	22
27 99 n	1B 63 n	ESC C n	Print Blank Characters or Lines	24
27 102 m n	1B 66 m n	ESC f m n	Select/prohibit Reverse White Print	19
27 105 n	1B 69 n	ESC i n	Set Left Margin	24
27 108 n	1B 6C n	ESC l n	Set Character Space	19
27 112 n	1B 70 n	ESC P n	Choose Codepage	21
27 116 n	1B 74 n	ESC t n	Set Chinese Double Width Print	26
28 14 n	1C 0E n	FS SO n	Cancel Chinese Double Width Print	30
28 20	1C 14	FS DC4	Select Chinese Print Mode	30
28 38	1C 26	FS &	Chinese Character with Up-line Print	29
28 43 n	1C 2B n	FS + n	Chinese Character with Underline Print	31
28 45 n	1C 2D n	FS – n	Cancel Chinese Print Mode	31
28 46	1C 2E	FS ·	Set Chinese Character Rotational Print	30
28 73 n	1C 49 n	FS l n	Set Vertical Print	31
28 74	1C 4A	FS J	Set Horizontal Print	30
28 75	1C 4B	FS K	Print Pre-saved Bitmap	31
28 80 n	1C 50 n	FS P n	Set the Enlarging Multiple of Chinese Character	25
28 87 n	1C 57 n	FS W n	Choose printing position of HRI character	30
29 72 n	1D 48 n	GS H n	Set Barcode Height	37
29 104 n	1D 68 n	GS h n	Print Barcode	37
29 107 n	1D 6B n	GS k n	Set Barcode Width	34
29 119 n	1D 77 n	GS w n	Print M Curve dots (dashed)	38