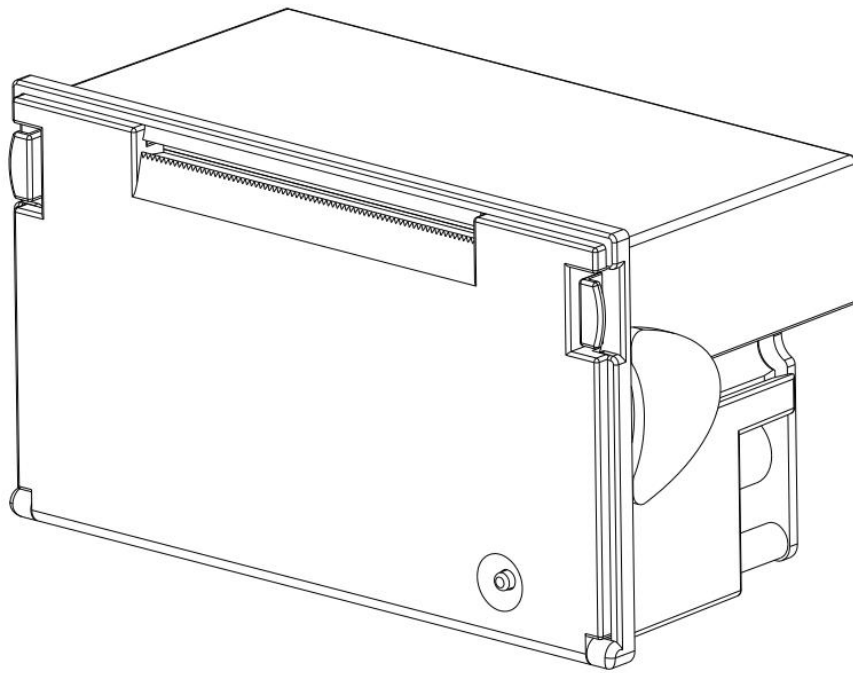


SPRT®

SP-D10 Dot Matrix Printer

User's Manual

V1.02



Beijing Spirit Technology Development Co., Ltd

www.sprt-printer.com

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Brief Introduction

SP-D10 dot matrix mini printer is a intelligent printer which manufactured by SPRT in 21th century. The machine adopt new imported clock mechanism with computer single chip, with the advantages of small volume, light weight, fully functional, high speed, high-definition, beautiful appearance, simple operation, convenient connection and so on. SP-D10 dot matrix mini printer with full product line, standard installation size. It is the best replacement used in medical equipment, fire control station, industrial control and other instruments and apparatus.

SP-D10 dot matrix mini printer can print all ASCII characters as well as English, Greek, German, French, Russian, Japanese katakana. What's more it also can print 16x16 or 12x12 dots Chinese characters as well as a large number of mathematical symbols, graphics and curves. According to different commands, it can change the size and space of the printed word and characters, also can customize the code characters and has the self- test function.

Chapter1 Characteristics and performance

1.1 Main Features

- ◇Using dot matrix printing method
- ◇Integrating the print head and circuit with one body, easy to be installed
- ◇Comes with a single chip processor, with standard parallel interface or serial interface, facilitate with various mini machines or online using intelligent instruments
- ◇With the real-time print command of Chinese, characters and graphics, which can print all of the standard 5x7 dots ASCII characters and 16x16 or 12x12 dots Chinese characters. Commands set is compatible with the traditional printer's.
- ◇The printing speed have 1.2lines/s, 0.7line/s, 0.4line/s three types for different models.
- ◇With self-test function, print all code, high HD characters and beautiful font
- ◇ DC power supply 5V±5%,1.5A
- ◇Operating Temp/Humidity 0~50℃

1.2 Performance Index

- ◇Printing Method: dot matrix
- ◇ Paper type, Plain paper, width 44.5±0.5mm or 57.5±0.5mm, built-in diameter less than 40mm outside diameter less than 80mm
- ◇International level 3 Chinese characters fonts
- ◇Enough print buffer 17KB
- ◇Printing all of the 448 characters, including 96 ASCII characters, Greek, German, French, Russian etc letters, Japanese katakana, part of Chinese, mathematical symbols and block diagram etc.
- ◇Character constitutes: ANK: 5×7dots , 8x16dots or 6x12dots for Chinese
Chinese characters: 16×16 or 12×12 dot
- ◇Block diagram: 6×8 dot
- ◇Interface: Serial interface (CENTRONICS compatible), Parallel (RS-232 or TTL) ,

485 interface

◇ Interface connector: Serial interface: IDC10 pin socket

Parallel interface IDC26 pin socket

◇ Control code: General ESC, FS control code

◇ Reliability: MCBF (Mean Cycles Between Failure) $(5\sim 15) \times 10^6$

◇ TPH: 1,500,000 lines

◇ Power supply: DC5V \pm 5% , 1.5A

◇ Working Temp: 0 \sim 50 $^{\circ}$ C, Humidity: 10 \sim 80%

◇ Storage temp and humidity: -20 \sim 60 $^{\circ}$ C, 10% \sim 90%

◇ Installation dimensions: 103mm \times 57mm(W \times H) Embedded depth: 51mm

◇ Outline dimensions: 107mm \times 61.5mm \times 55.5mm(W \times H \times D)

Main parameters of SP-D10 series dot mini printer

Model	character/line (5 \times 7)	Character size(mm)	Dot/line	Speed (line/s)
16 series	16	1. 8 \times 2.5(W \times H)	96	1.2
24 series	24	1. 7 \times 2.4(W \times H)	144	0.7
40 series	40	1. 1 \times 2.4(W \times H)	240	0.4

Chapter 2 Printer Installation

2.1 Installation Dimension

SP-D10 series dot mini printer outline dimension shown as figure 2-1:

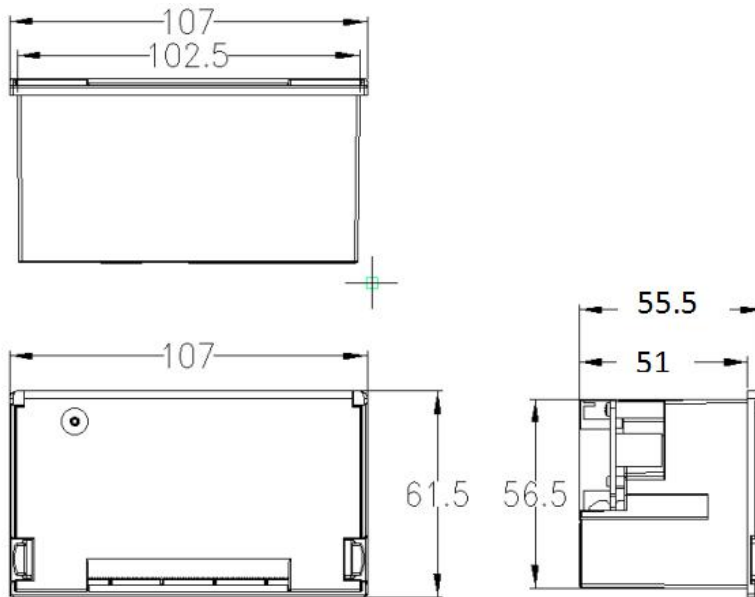


Figure 2—1

2.2 Paper Loading

SP series dot mini printer use the paper with $44.5\text{mm}\pm 0.5\text{mm}$ or $57.5\text{mm}\pm 0.5\text{mm}$ width plain paper. It has installed paper roll before out of factory, but the paper isn't inserted into the printer head in order to avoid the damage of printer head during transport or long time storage. So before using the printer, the paper roll must be inserted into the head. Loading paper processes as below:

- (1) As shown of figure 2-2: holding the two hooks shown in the figure with arrow to drag, open the printer cover.

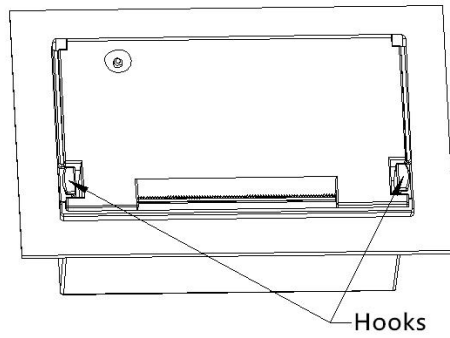
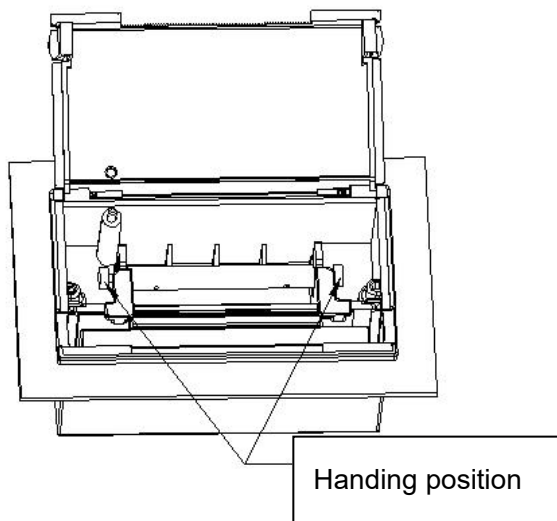


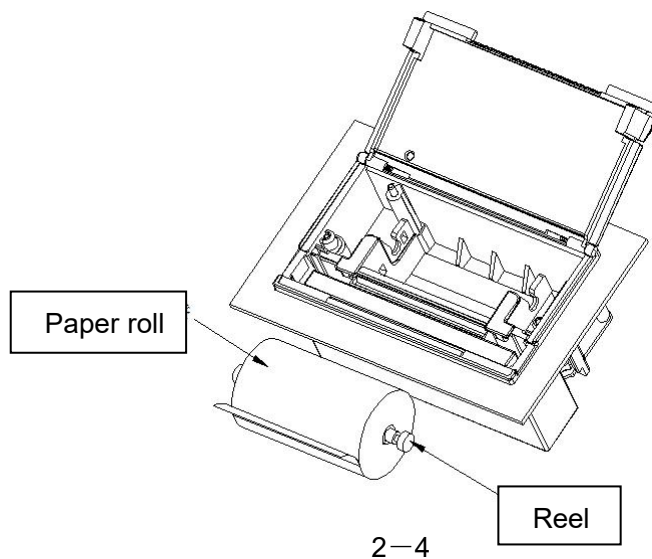
Figure 2—2

(2) Holding the both ends of the paper shaft shown as below, take out the reel.



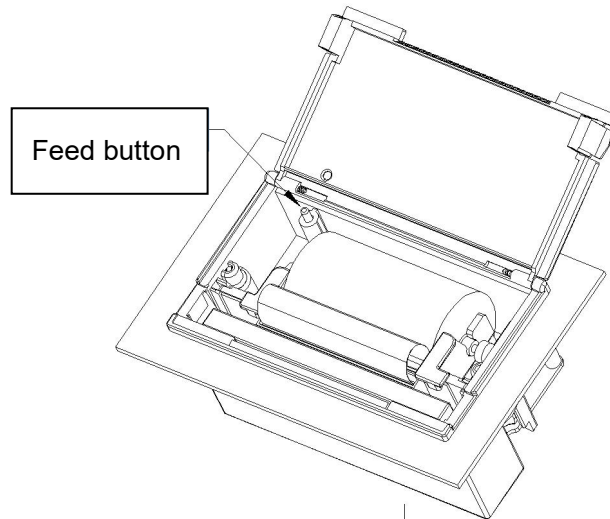
2—3

(3) Install the paper to the reel as shown the figure of 2- 4, holding the both ends of the reel, put the paper roll into the paper storehouse, release the reel.



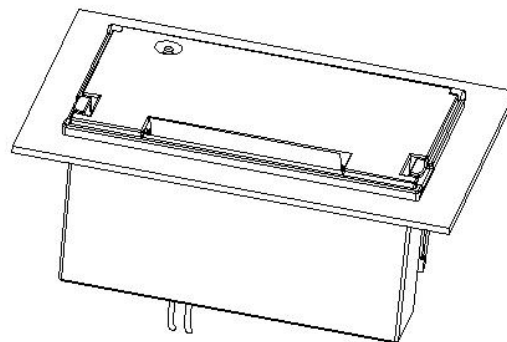
(4) Power on, press the 【FEED】 button, put the paper into the entrance, press the 【FEED】 button to stop feeding paper after the paper come out from the exit.

Shown as figure of 2--5:



2-5

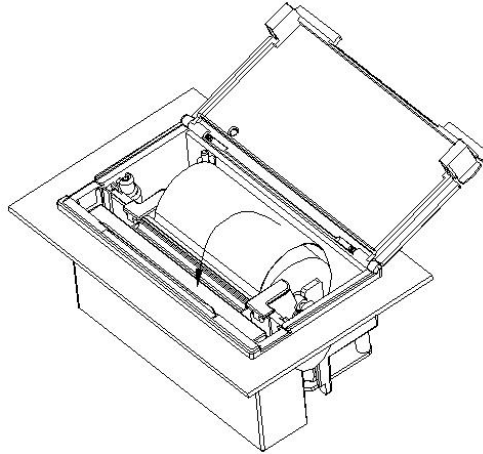
(5) Push-in the inner shell completely, chucking with the outer shell to finish the paper loading, shown as figure of 2--6:



2-6

Attention:

1, It will cause a paper jam if the paper roll fluffy beyond the printer's loam cake, then you should cinching the roll and close the shell shown as figure of 2--7:



2-7

2, If the inner shell can't be pushed, please pull it out and try again, do not do it vigorously to avoid damage the printer.

2.3 Power supply connection

SP-D10 dot matrix printer use single DC +5 power.

SP-D10 dot matrix printer supply a socket which with two lines power cable.

The socket has polarity protection agency, which can insert the dot PCB board directly.

And the red cable need connect to the anode (+) , white cable connect to cathode (—) .

Please notice: this rule can't be against, otherwise it will damage the printer.

Chapter 3 Operating Instructions

3.1 Interface connection

3.1.1 Serial interface connection

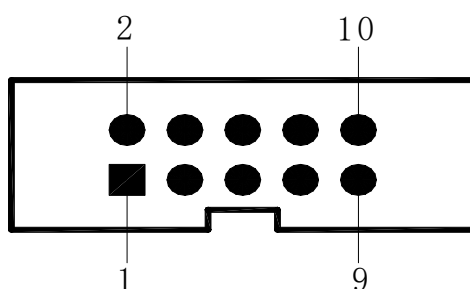
SP-D10 serial interface is RS-232 serial interface and 485 serial interface.

1, RS-232 Serial interface

232 interface levels for both EIA and TTL, support RTS/CTS and XON/XOFF handshaking protocol, the interface types are IDC10 PIN socket and 5 PIN single socket.

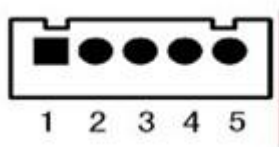
each types of socket cords number are defined as follows:

IDC10 pin numbers definition shown as figure 3--1:



3—1 Serial interface IDC10 pin socket pin numbers

5PIN single socket pin numbers definition cords number shown as figure 3-2:



3—2 5PIN single socket pin numbers

Serial interface each pin number definition shown as figure 3-1:

Signal Name	IDC10 socket pin number	5PIN socket pin number	Source	Instruction

RXD	3	3	PCB board	Printer receive data from computer
TXD	2	2	printer	Printer send data to computer,when use X-ON/X-OFF handshaking protocol agreement, the printer will send control code X-ON/X-OFF to computer
CTS	8	4	printer	When the signal show "MARK", it means the printer is busy and can not receive data, when the signal show "SPACE", it means the printer get ready to receive data.
DSR	6	1	Printer	when the signal show "SPACE" it means the printer is online
GND	5	5	—	Signal ground
DCD	1		Printer	Same as CTS

3-1 Serial interface pin number definition

Mark: ①"Source" mean the source for the signal

② The signal logic can be EIA or TTL level due to different insert sockets; Under the serial interface connection, baud rate and data structure can be set by button or software. Before out of factory, the product has been set with 9600bps, 8 data bits, no calibration and a stop bit. Two types of handshaking protocol agreements can be chosen. One is mark control way, the other is X-ON/X-OFF handshaking protocol agreement. Two kinds of handshaking protocol's instructions shown as figure 3--2:

Type of Handshaking	Data direction	RS-232C interface signal
mark control	Data allowable	Signal line 1 and 8 are show Space
	Data disallowed	Signal line 1 and 8 are show Mark

X-ON/ X-OFF control	Data allowable	Send X-ON code 11H on signal line 2
	Data disallowed	Send X-OFF code 13H on signal line 2

3-2 Two types of handshaking

2, 485 Serial interface

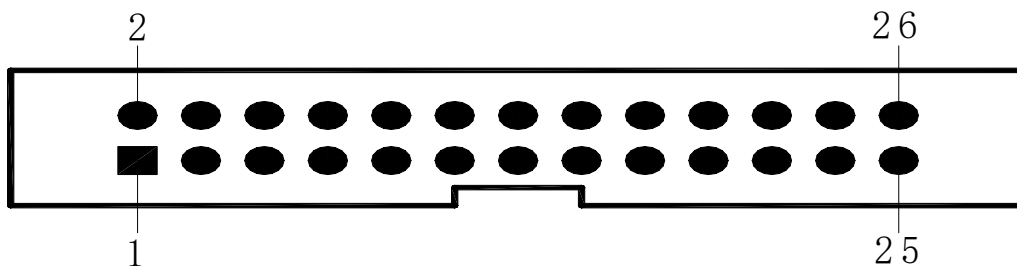
485 interface is IDC10 pin socket, socket pin number refer to figure of 3--1, every pin definitions are different with interface RS-232. 485 interface's effective socket is IDC10 pin socket which next to power supply, the pin definition as below:

Signal	IDC10 pin socket pin number
A	7
B	9

3-3 485 interface socket pin definition

3.1.2 Parallel interface connection

SP-D10 printer's parallel interface is compatible with CENIRONICS, Its interface socket is 26 lines flat cable or replace model. Parallel interface socket pin number shown as below:



3-3 Parallel interface socket pin number

The definitions of parallel interface pin number are shown as below:

PIN No.	Signal	Direction	Instruction
1	/STB	input	Gate trigger, input date on the rising edge.
3	DATA1	Input	Those signals represent the parallel data from 1 to 8, when the signal logic is "1", it is
5	DATA2	Input	

7	DATA3	Input	high level, logic shows "0" means low level.
9	DATA4	Input	
11	DATA5	Input	
13	DATA6	Input	
15	DATA7	Input	
17	DATA8	input	
19	/ACK	output	Pulse reply," low" level means the date has been received and printer is already to receive next date.
21	BUSY	output	"high" level means printer is " busy", can not receive data
23	/PE	output	Via resistors pull down to " low" level which means have paper
25	SEL	---	Via resistors pull down to " high" level which means printer online
4	/ERR	output	Via resistors pull down to " high" level which means have trouble-free
2, 6, 8	NC	---	Not connected
10, 12, 14, 16, 18, 20, 22, 24	GND	---	Ground connect, logic"0" level

3—4 Parallel interface pin definitions

Mark: ①"input" mean input into printer,"output" mean output from printer.

② The signal's logic level is TTL level.

3.1.3 The printer parameters setting

Printer parameters can be set via two ways:

1, Via software to set

You can download the software setting tool, instructions refer to setting tool.

2, Via SEL and LF Combination set

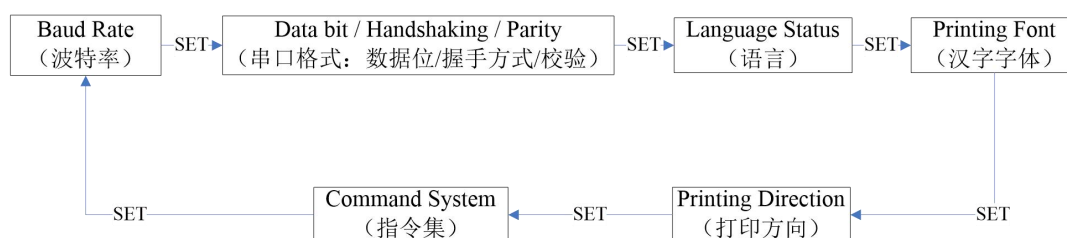
SP-D10 series mini printer has two buttons, feed button 【LF】 is in front panel, Setting button 【SET】 is in PCB which is on the behind.

SP-D10 series mini printer only have one green online indicator light. Indicator lights up means the printer is on-line, otherwise it means off-line or busy.

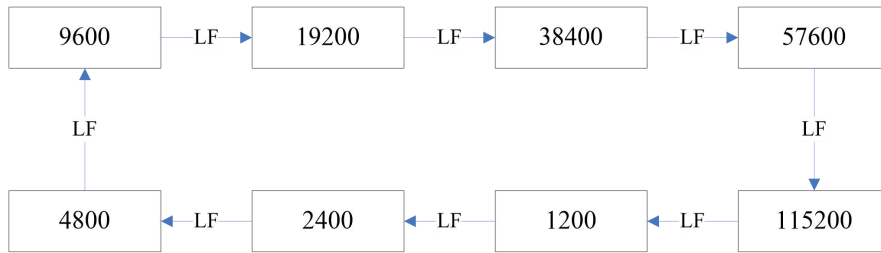
Enter the parameter setting model: press【SET】button and turn on the power, the printer enter into the state of setting, meanwhile print out the notice message. Use the 【SET】 button to choose the setting items, the setting items will change to the next by pressing the 【SET】 every time, and print out the current setting value. Use 【LF】 button to choose the value you want for the setting items, and the value will change to the next after press the 【LF】 button.

Exit the parameter Setting model: press the 【LF】 button, then press 【SEL】 button, release 【LF】 button and 【SEL】 button,the printer will print out “Exit Set Mode” notice message. Now the set parameters have saved and exit the setting mode enter into normal working state. If you turn off the power of the printer, the setting parameters will not saved.

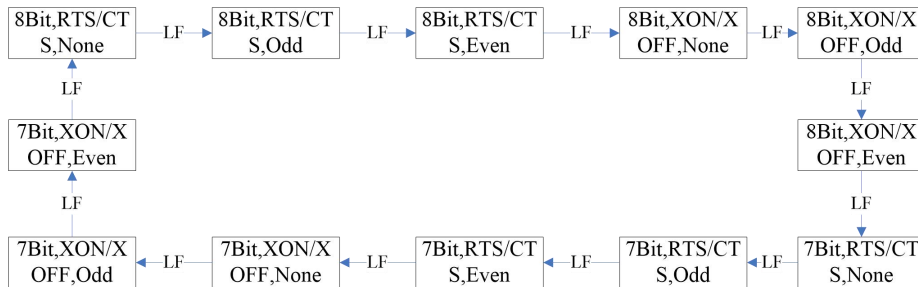
Head setting (connect through Parallel interface, there is no baud rate and Serial interface format setting items) :



2.1, Baud Rate:



2.2, Data bit / Handshaking / Parity (connect through serial interface)



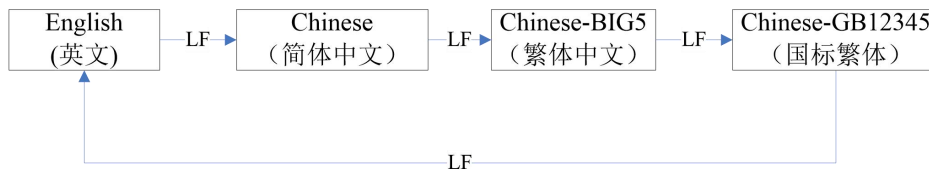
Instructions:

Data Bit: 8bit or 7

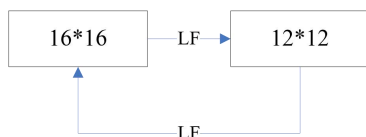
Handshaking: RTS/CTS or XON/XOFF

Parity: None or Odd or Even

2.3, Language Status:

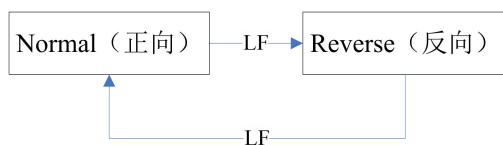


2.4, Printing Font (Chinese setting) :

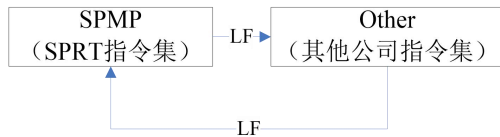


Instruction: Chinese characters font is only effective in Chinese mode. Under English model, only font 6*8 is available.

2.5, Printing Direction:



2.6, Command System:



3.2 Self-test and HEX printing

Printing self-test can check if the printer works well or not. If it can print out the self-test receipt correctly means everything is okay (except the interface with the computer). Otherwise it need an overhaul.

Self-test receipt and analysis

Self-test shows software version, interface forms, characters and other configuration information. Self-test receipt shown as below:



3-4 Self-test receipt

The left is the self-test receipt of Serial interface model, the right is self-test receipt of Parallel 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: Z-195 1.01	版本号: Z-195 1.01
2	Interface: RS232 (EIA,TTL) Interface: Parallel	接口类型: RS232 串口 (EIA,TTL) 接口类型: 并口
3	Baud Rate: 9600(Parallel model without this content)	波特率: 9600 (并口机型无此项)
4	Data bit/Handshaking/Parity:8 bit / RTS/CTS / None (Parallel model without this content)	串口数据位/握手方式/校验方式: 8位/标志控制/无校验
5	Language Status: English	语言: 英文
6	Printing Font: 16*16	汉字字体: 16*16
7	Printing Direction: Reverse	打印方向: 反向
8	Command System: SPMP	指令集: SPRT微打指令集

Mark:

1, The default data may different when the printer is out of factory, so the font size, content of each item in the self-test may also different. Please refer to the actual printed receipt, the above picture is for reference only.

2, The specific content of each item set can refer to "3.1.3 printer parameters set" section. After setting manually each time, it can be identified whether the setting is successfully or not by printing self-test receipt.

3, Above pictures are only for SP-D10-24XH self-test receipt, the content of SP-D10-16XH or SP-D10-40XH self-test receipt is more or lest the same as the above one. But in different font size. The specific content can be subject to actual receipt.

Self-test printing:

Press 【LF】 button (The button on the front panel) and turn on the power, the green indicator light will flash with the frequency of 1s, release the 【LF】 button within the indicator light flashes three times, printer will print out the self-test receipt.

HEX printing method

Press **【LF】** button (The button on the front panel) and turn on the power, the green indicator light will flash with the frequency of 1s, after the indicator light flashes three times, release the **【LF】** button. After that the green light will continue flash three times then off. Printer will print out "Hexadecimal Dump", now the printer enter into HEX DUMP mode.

3.4 Printer Initialization

There are two methods for printer initialization. One is with the control code ESC @. Computer will send commands to printer, with the software to realize initialization. The other is restart the printer.

Chapter 4 Print Commands

4.1 Summary

The printing commands provided by dot matrix printers are fully compatible with traditional ESC print command. Each command description form as below:

Control code name	Function
Form: ASCII:	standard ASCII character sequence
Decimal:	decimal number sequence
HEX :	hexadecimal digit sequences

Note: The command functions and instructions

Example: In order to make it easier to understand the command function, the commands will be introduced by groups.

The following will introduce these commands according to the function types of commands.

The printing results of following examples are all from A series printer, reverse printing which means the bottom part was printed first.

4.2 Commands Description

4.2.1 Paper feed command

LF	Change line
Form: ASCII:	LF
Decimal:	10
HEX:	0A

Explain: When sending a LF command to the printer, all data which in the print buffer will be printed and go forward a line. The effect is the same as carriage return (CR) command.

If LF command and CR are used together, then only one command is effective.

ESC J

Execute "n" dot feed paper

Form: ASCII:	ESC	J	n
Decimal:	27	74	n
HEX:	1B	4A	n

Explain: Printer prints forward with "n" point line. The value of n should be within the range of 1 to 255 points. This command is not issued a carriage returns. It will not affect the change line command later. If you need to produce immediately feed paper and don't return, you can use the ESC J command. Commands ESC V, ESC W, FS W will enlarge line spacing.

ESC 1

Set n point line spacing

Form : ASCII:	ESC	1	n
Decimal:	27	49	n
HEX:	1B	31	n

Explain: Set n point line spacing for changing line commands later.

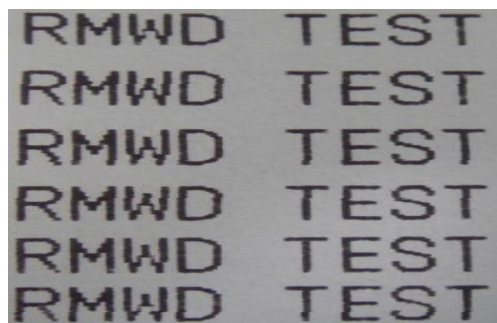
The value of N should be between 0 ~ 255. When using ESC K command to bitmap graphics printing, usually set n = 0, when the text printing way is usually set n = 3.

The default value of n = 3.

Observe the effect of this command, BASIC procedure is as follows:

```
FOR I = 1 TO 11 in STEP 2
LPRINT CRH $(27);CRH $(49);CRH $(I); 'the ESC 1 set the line spacing
LPRINT "RMWD TEST" 'print a string and line breaks
NEXT I
```

The printing results of above program are as follows:



4.2.2 Format setup command

ESC B	Set the vertical tabulation values				
Form: ASCII:	ESC	B	n1	n2	n3...NUL
Decimal:	27	66	n1	n2	n3...0
HEX:	1B	42	n1	n2	n3...00

Explain: Vertical tabulation location input n1, n2, etc.

NUL character is added at the last to indicate the end of this command.

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

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

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

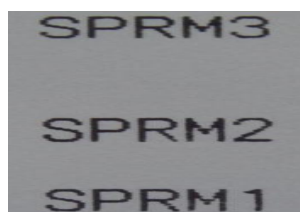
ASCII:	ESC	B	STX	ENQ	BS	NUL
Decimal:	27	66	2	5	8	0
Hexadecimal:	1B	42	02	05	08	00

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$(11); 'VT command
LPRINT "SPRM1" 'Print a string
LPRINT CHR$(11); 'VT command
LPRINT "SPRM2" 'Print a string
LPRINT CHR$(11); 'VT command
LPRINT "SPRM3" 'Print a 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

Command HT carry out horizontal tab.

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:

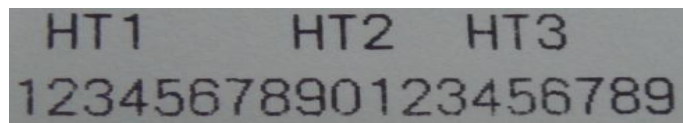
```
LPRINT    "1234567890123456789"
```

```
          'Ruler
```

LPRINT CHR\$(27); CHR\$(68);CHR\$(2);CHR\$(9);CHR\$(14); CHR\$(0); 'ESC D
command

LPRINT CHR\$(9); 'HT command
LPRINT "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
```

<u>HT</u>		<u>Carry out Horizontal Tab Value</u>
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.

<u>ESC f</u>		<u>Print Blank Characters or Lines</u>			
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” is in the range of the line width value of dot matrix series printers.

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 value, the printer will continue to print blank in the next line.

When m=1, paper will feed n times of 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” is in the range of the line width value of dot matrix series printers.

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.

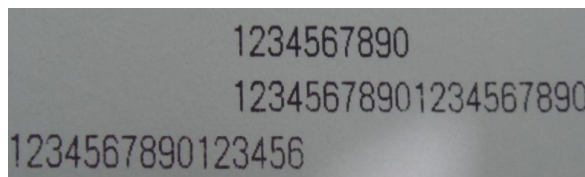
Example: set left margin value to 12, you can send the following commands:

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” is in the range of the line width value of dot matrix series printers.

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
```

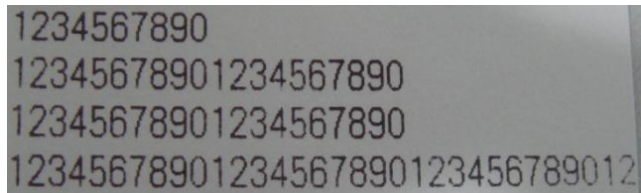
```
LPRINT CHR$(27); CHR$(81);CHR$(12); 'ESC Q command
```

```
LPRINT "123456789012345678901234567890";
```

```
LPRINT
```

```
"1234567890123456789
```

0" The print result is as following:



4.2.3 Character set command

```
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=1~4. Default n=1

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

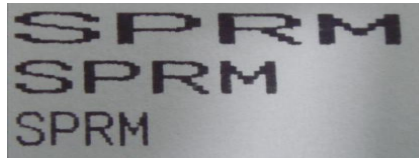
```
FOR I=1 TO 3
```

```
LPRINT "CHR$ (27); CHR$ (85);CHR$ (1); 'ESC U command
```

```
LPRINT "SPRM"; 'Print character string
```

```
NEXTI
```

The print result is as following:



ESC V

Enlarge Height

Form: ASCII:	ESC	V	n
Decimal:	27	86	n
HEX:	1B	56	n

Explain: After inputting this command, the characters, graphics and Chinese characters are printed at n times of normal height, n=1~4. Default n=1. This command should be sent out at the beginning of one line, otherwise, only the last set is effective.

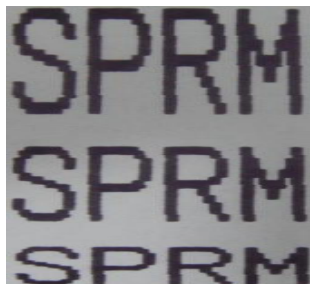
The BASIC programs for observing the enlarging effect of this command are as below:

```

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

```

This process print out from dot matrix printer as below:



ESC W

Enlarge vertical and horizontal

Form: ASCII:	ESC	W	n
Decimal:	27	87	n
HEX:	1B	57	n

Explain: After inputting this command, the characters, graphics and Chinese characters are printed at n times of normal width and height, n=1~4. The default n = 1.

```

FOR I=1 TO 3                                'from 1 to 3 times

```

```
LPRINT CHR$(27); CHR$(87); CHR$(1);      'ESC W command
LPRINT "SPRM"                             'Print a string
NEXT I
```

This process print out from dot matrix printer as below:



ESC -		Allow/prohibit Underline Print	
Form: ASCII:	ESC	-	n
Decimal:	27	45	n
HEX:	1B	2D	n

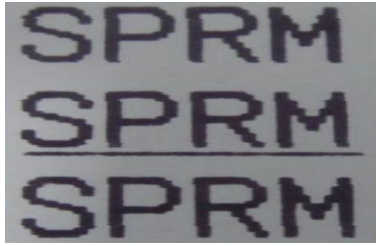
Explain: N = 1, allow the underline print; N = 0, underline print is prohibited. The default n = 0.

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

To observe the effect of the command, BASIC program is as follows:

```
LPRINT CHR$ (27); CHR$ (57); CHR$ (2); ' Enlarge the vertical and horizontal size
twice
LPRINT "SPRM";
LPRINT CHR$ (27); CHR$ (45); CHR$ (1); ' Allow underline print
LPRINT "SPRM";      ' Dot matrix print with underline
LPRINT CHR$ (27); CHR$ (45); CHR$ (0); ' Cancel underline print
LPRINT "SPRM";
```

The print result is as following:



ESC + Select/prohibit over-line Print

Form: ASCII:	ESC	+	n
Decimal:	27	43	n
HEX:	1B	2B	n

Explain: When n=1, allow over-line print; when n=0, prohibit over-line print. Default n=0

All characters including spaces will be printed out with over-line after allowing over-line print. This command is also valid for Chinese characters.

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

```
LPRINT CHR$(27); CHR$(57); CHR$(2); ' Enlarge the vertical and horizontal size
twice
```

```
LPRINT "SPRM";
```

```
LPRINT CHR$(27); CHR$(43);CHR$(1); ' allow over-line print
```

```
LPRINT "SPRM";' Dot matrix print with over-line
```

```
LPRINT CHR$(27); CHR$(43);CHR$(0); ' prohibit over-line print
```

```
LPRINT "SPRM";
```

The print result is as following:



ESC 6 Select the character set 1

Form: ASCII:	ESC	6
Decimal:	27	54
HEX:	1B	36

Explain: All characters in character set 1 of ANK mode are used after this command. For dot matrix series printers, there are two character sets available in ANK mode. Character set 1 is selected when printer is on or receives command ESC @.

ESC 7		Select the character set 2	
Form: ASCII:	ESC	7	
Decimal:	27	55	
HEX:	1B	37	

Explain: After inputting this command, all the characters will be printed out according to the Characters Set2 in ANK. Please refer to ESC 6.

SO		Setting n times width printing	
Form: ASCII:	SO		
Decimal:	14		
HEX:	0E		

Explain: In one line, all characters will be printed as twice width of normal width after this command. This command can be canceled by Enter or DC4 command. Normal width characters and width-enlarged characters can be printed in one same line.

DC4		Cancel n times width printing	
Form: ASCII:	DC4		
Decimal:	20		
HEX:	14		

Explain: Cancel n times width printing set based on SO command by DC4 command. This command can't cancel Characters Enlarging by ESC U and ESC W command.

ESC i		Select/prohibit highlighting Print	
Form: ASCII:	ESC	i	n
Decimal:	27	105	n
HEX:	1B	69	n

Explain: When n=1, select highlighting Print; when n=0, prohibit highlighting Print. Default n=0.

Highlighting Print is printing white characters 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.

BASIC process as follow:

```
LPRINT CHR$(27); CHR$(105); CHR$(1), 'allow highlighting Print
LPRINT "SPRD"
```

This process print out from dot matrix printer as below:



ESC	c	Select/prohibit Reverse Print		
Form: ASCII:	ESC	c	n	
Decimal:	27	99	n	
HEX:	1B	63	n	

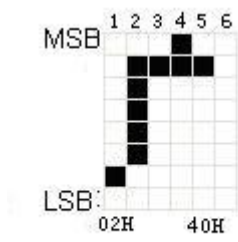
Explain: When n=1, select reverse print; when n=0, prohibit reverse print. Default n=1.

Notice: Reverse print not only support character mode but also support 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.

4.2.4 User-defined character set command

ESC	&	User-defined character				
Form: ASCII:	ESC	&	m	n1	n2.....n6	
Decimal:	27	38	m	n1	n2.....n6	
HEX:	1B	26	m	n1	n2.....n6	

Explain: This command allows the user to define a single character, m is the character code of the user-defined parameters, should be between 32 to 255. Parameter n1, n2... N6 is to define the structure of this character code. Character is composed of 6 x 8 dots. Namely six columns per column, at 8 o'clock every column by one byte data representation, highest level, as shown in the figure below:



User defined characters stored in RAM, will be lost when the power is cut off, if many ESC & command using the same m value, only the last valid. 32 most can define user-defined character. See the ESC % and ESC: command.

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

Explain: 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.

ESC :	Recover Character in Character Set	
Form: ASCII:	ESC	:
Decimal:	27	58
HEX:	1B	3A

Explain: 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);           8 times horizontal and vertical size
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 command

	ESC	K	Print the dot-matrix graphics		
Form: ASCII:	ESC	K	n1	n2.....	data.....
Decimal:		27	75	n1	n2.....data.....
HEX:		1B	4B	n1	n2.....data.....

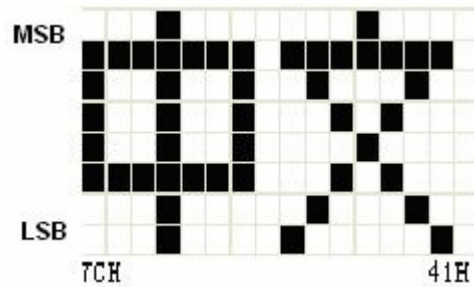
Explain: This command is used to print $(n_2 \times 256 + n_1) \times 8$ bit dot-matrix graphics. The width of this graphics is $(n_2 \times 256 + n_1)$ dots and the height is 8 dots. Each column has 8 dots and can be presented by a 8-bit byte, the MSB is on the top.

The values of n_1 , n_2 denote a 16-bit binary data, n_1 is LSB and n_2 is MSB, which mean that the width of printed dot-matrix graphics through ESC K command is $n_2 \times 256 + n_1$. For dot matrix series printers, $n_2=0$ and n_1 should be between 1 and the largest dots numbers. Data are the bytes content of each column in this graphics. The bytes number should equal to n_1 .

For example: If you want to print two Chinese characters “中文” with ESC K command, the

dot-matrix graphics 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:

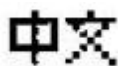
7C, 44, 44, FF, 44, 44, 7C, 00, 41, 62, 54, C8, 54, 62, 41



The BASIC process about this example as follow:

```
LPRINT CHR$(27); "W"; CHR$(4);           Enlarge horizontal and vertical size 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
```

The print result is as following:



ESC ' _____	Print the curve
Form: ASCII: ESC ' m n1 n2.....nm CR	
Decimal: 27 39 m n1 n2.....nm 13	
HEX: 1B 27 m n1 n2.....nm 0D	

Explain: This command is used to print curve along the paper-feeding direction. The value of m is the number of curves to be printed, which should be between 1 and the largest dots number.

There are m dots of curve in one horizontal line. N1, n.....nm presents the positions

of these m curves. The numbers of nm 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 n1, n2,nm data.

4.2.6 Initialization Commands

ESC @	Initialize Printer	
Form: ASCII:	ESC	@
Decimal:	27	64
HEX:	1B	40

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

- △Remove the print buffer;
- △Recover Defaults ;
- △Select the character set;
- △Delete user-defined characters.

4.2.7 Data control command

CR	Enter	
Form: ASCII:	CR	
Decimal:	13	
HEX:	0D	

Explain: When sending a CR command to the printer, all data in the print buffer will be printed out and paper will be fed one line. The effect is same with that of command LF.

If command LF is used with CR together, only one command is valid.

NUL	Blank	
Form: ASCII:	NUL	
Decimal:	0	
HEX:	00	

Explain: NUL command and some commands, such as: ESC B, ESC D, ESC % and

ESC 'are used together, are used to represent the end of the command.

Single NUL command is not valid.

4.2.8 Chinese printing control command

FS	&	Set Chinese printing type	
Form: ASCII:	FS	&	
Decimal:	28	38	
HEX:	1C	26	

Explain: After the command is input printer, printer will print from ANK characters to the Chinese printing type.

FS	.	cancel Chinese printing mode	
Form: ASCII:	FS	.	
Decimal:	28	46	
HEX:	1C	2E	

Explain: After entering the command, the printer will print from Chinese characters mode to ANK characters mode.

FS	SO	Set Chinese Double-Width Print	
Form: ASCII:	FS	SO	
Decimal:	28	14	
HEX:	1C	0E	

Explain: After input this command, characters 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	
Form: ASCII:	FS	DC4	
Decimal:	28	20	
HEX:	1C	14	

Explain: This command is to cancel FS SO command.

FS	W	Set the magnification of Chinese Character		
Form: ASCII:	FS	W	n	
Decimal:	28	87	n	
HEX:	1C	57	n	

Explain: After this command, the character will be printed at 1 time enlarging from width and height. This command is valid when n=1 and cancel when n=0.

FS	J	Set Vertical Print		
Form: ASCII:	FS	J		
Decimal:	28	74		
HEX:	1C	4A		

Explain: This command will make the print characters of vertical print, namely 90 ° anticlockwise printing.

FS	K	Set the horizontal print		
Form: ASCII:	FS	K		
Decimal:	28	75		
HEX:	1C	4B		

Explain: This command will make the print characters of horizontal print, if there is no set rotation command, horizontal print characters, namely normal print.

FS	I	Set the rotation print		
Form: ASCII:	FS	I	n	
Decimal:	28	73	n	
HEX:	1C	49	n	

Explain: This command can turn the Chinese characters, the value of n in the following table:

n	Character counterclockwise rotation
0	0°
1	90°

2	180°
3	270°

FS - Chinese Character with Underline Print

Form: ASCII:	FS	-	n
Decimal:	28	45	n
HEX:	1C	2D	n

Explain: The specified Chinese characters after this command are printed with underline. N = 1, the underline; N = 0, underline the end.

FS r Choice the superscript and subscript printing

Form: ASCII:	FS	r	n
Decimal:	28	114	n
HEX:	1C	72	n

Explain: This command can choice the position of the superscript and subscript, n = 0 is superscript, n = 1 is a subscript. The function of this command is that, when in one line, Chinese characters (8*16 or 6*12) or Chinese (16*16 or 12*12) exist with English characters (6*8), English characters are in one same line with Chinese. The format is superscript or subscript.

Default: n = 1; The subscript mode.

FS G Set the characters dislocation printing

Form: ASCII:	FS	G
Decimal:	28	71
HEX:	1C	47

Explain: This command is used to set Chinese characters dislocation printing. After the command input, Chinese characters for the printer will print in dislocation way, namely the Chinese characters is more bold and thicker than normal single characters, which can be used for printing the title or retype it.

FS H Cancel Chinese characters dislocation printing

Form: ASCII:	FS	H
--------------	----	---

Decimal:	28	72
HEX:	1C	48

Explain: This command can cancel the dislocation printing of Chinese characters and return to normal single print Chinese characters.

Chapter 5 Operation and maintenance

5.1 The print head maintenance

In order to make sure the printer working as normal, especially not to tear down the print head. For users who do not use the printer shell, Please pay more attention to protect the head.

- (1) Please do not connect the power supply if the printer is not use for a long time.
- (2) Please turn off the power supply if the printer works in abnormality.
- (3) The power supply must meet the requirement, or will damage the print head.
- (4) Please do not put lubricating oil on the print head.
- (5) When change the paper roll, pay attention to the print head whether there have scraps of paper on the head, if yes, please blow away lightly.
- (6) Replacing foil box, do not use strong pressure foil box, otherwise may crush on plastic shaft.

5.2 Others

Please also note the following aspects

- (1) Don't socket chip, if there are any abnormal, please send to factory for maintenance.
- (2) Don't ribbon on the box of oil, or damage to the head.
- (3) When users to suppress the connection wire, Please do note that the printer interface is parallel or serial interface mouth to avoid not connection error and host.

Appendix 1 Effective code table

The serial number of valid code table is from 00H - 0FFH arrangement, during which 00H-1FH is used for control code and 20H - 0FFH for character code. The character code has two sets totally. Each character set is the character code in the 20H- 0FFH arrangement.

Character 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	Δ	Π	Σ	Ψ	Ω	Ξ	Θ	Λ	φ	Υ	∠
C	⌈	⌋	⌈	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋
D	⌈	⌋	⌈	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋
E	⌈	⌋	⌈	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋	⌊	⌋
F	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪	▪

Character set 2:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
2	百	千	万	Π	℃	℉	⁻¹	₄	¼	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	ス	ネ	ノ	ハ	ヒ	フ	ヘ	ホ	マ	
8	ミ	ム	メ	モ	プ	┘	ヨ	ラ	リ	ル	レ	ロ	ワ	ヰ	ヱ	ヲ	
9	ン	ァ	ゥ	ェ	ォ	カ	ユ	ヰ	ヱ	○	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	ã	ä	ã	š	é	ë	è	ï	í	î	Ä
C	Ä	É	æ	Æ	Ô	Õ	Ö	Ù	Ú	ÿ	Ö	Ü	ƒ	ƒ	ó		
D	í	ó	ù	ñ	Ñ	ä	ä	é	é	ü	é	ä	ä	ä	ä	š	
E	é	ë	è	ï	í	î	Ä	Ä	É	æ	Æ	Ô	Õ	Ö	Ù	Ú	
F	ÿ	Ö	Ü	ƒ	ƒ	ó	í	ó	ù	ñ	Ñ	ä	ä	é	é	ü	

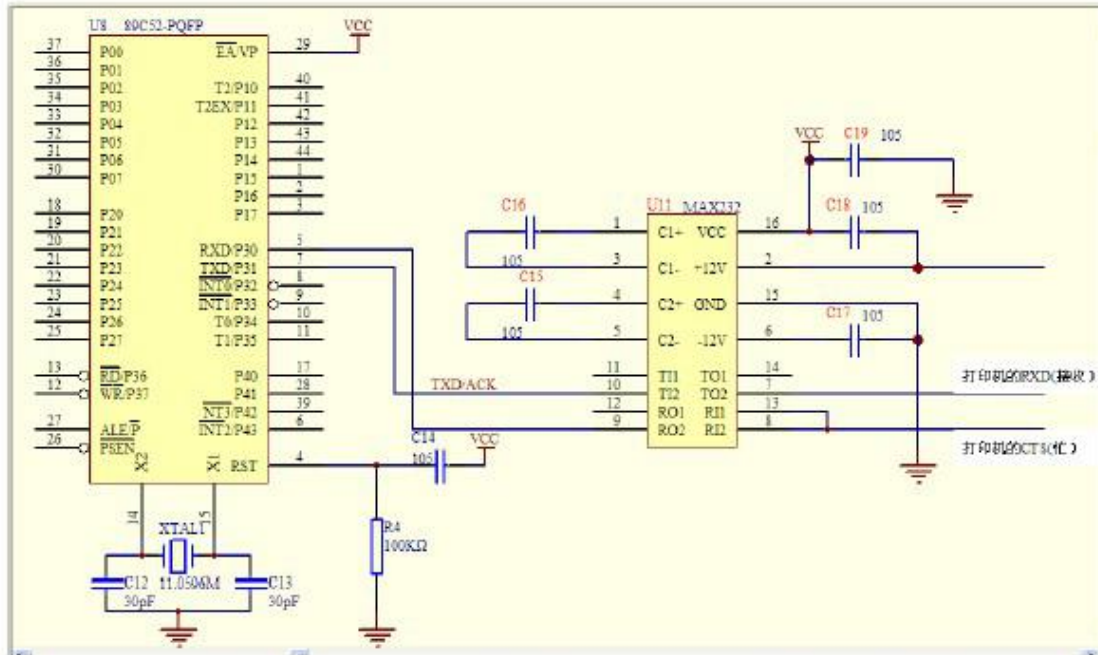
Appendix 2 Print command table

Decimal	HEX	Symbols and format	Function	Page
0	0	NUL	End mark	33
9	9	HT	Level clock	22
10	0A	LF	Change line	19
11	0B	VT	Vertical tabulation	21
13	0D	CR	Enter	33
14	0E	SO	Setting times width of characters	28
20	14	DC4	Cancel times width setting	28
27 37	1B 25	ESC % m1 n1...mk nk NUL	Change NK to MK	30
27 38	1B 26	ESC & m n n n2...n6	CGRAM	29
27 39	1B 27	ESC ,m n1 n2...nk	Print M curve points	32
27 43 n	1B 2B n	ESC +n	Allow/ban on line printing	27
27 45 n	1B 2D n	ESC -n	Allow/underline print is prohibited	26
27 49 n	1B 31 n	ESC 1 n	Set the line spacing for N points	20
27 54	1B 36	ESC 6	Select character set 1	28
27 55	1B 37	ESC 7	Select character set 2	28
27 58	1B 3A	ESC :	Restore the original code	30
27 64	1B 40	ESC @	Initialize printer	32
27 66	1B 42	ESC B n1...nkNUL	Set straight clock	20
27 68	1B 44	ESC D n1...nk NUL	Set the level of clock	22
27 74 n	1B 4A n	ESC J N	Feed paper N point line	19
27 75	1B 4B	ESC K n1...n2...data	Print n×8 raster graphics	31
27 81 n	1B 51 n	ESC Q n	Set the right limit width	24

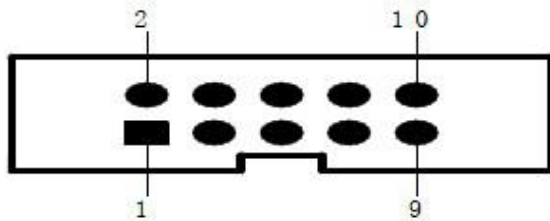
27 85 n	1B 55 n	ESC U n	Lateral magnification n times	25
27 86 n	1B 56 n	ESC V n	Longitudinal magnification n times	25
27 87 n	1B 57 n	ESC W n	Transverse longitudinal magnification n times	26
27 99 n	1B 63 n	ESC C n	Allow/reverse printing is prohibited	29
27 102 m n	1B 66	ESC f m n	Print blank form or change line	23
27 105 n	1B 69 n	ESC i n	allow/forbid reverse print	28
27 108 n	1B 6C n	ESC l n	Set limit width of the left	23
28 14	1C 0E	FS SO	Set up Chinese characters lateral magnification	33
28 20	1C 14	FS DC4	Cancel times width print	34
28	1C 26	FS &	Set up Chinese characters printed	33
28 45 n	1C 2D n	SF – n	Underline print Chinese characters	35
28 46	1C 2E	FS .*	Cancel the Chinese printing w	33
28 71	1C 47	FS G	Select print Chinese characters dislocation	35
28 72	1C 48	FS H	Select print Chinese characters dislocation	35
28 73 n	1C 49 n	FS l n	Set the rotary print characters	34
28 74	1C 4A	FS J	Set the vertical print	34
28 75	1C 4B	FS K	Set the horizontal print	34
28 87 n	1C 57 n	FC W n	Set the magnification of Chinese characters	34
28 114	1C 72 n	FS r n	Choice the subscript printing	35

Appendix 3 Single chip microcomputer interface instance

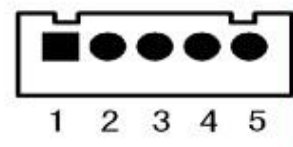
上位机硬件原理图推荐图:



推荐串口接三条线，分别是打印机的接收（RXD），打印机的忙（CTS），电源 GND。



IDC10PIN串口接线插座引脚序号

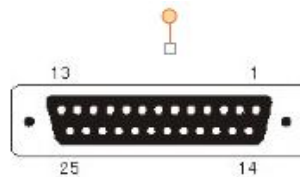


PDK-5单排串行接口插座引脚序号

Each pin signal is defined as shown

Signal name	IDC10 socket pin No.	5PIN socket pin No.	Source	Explain
RXD	3	3	computer	Printer receive data from computer
TXD	2	2	printer	Printer send control code XON/XOFF and data to

				computer.
CTS	8	4	printer	When the signal show “MARK”, it is means the printer is busy and can not receive data, when the signal show “ SPACE”, it is mean the printer get ready and can receive data..
DSR	6	1	printer	Signal show “ SPACE” means printer online
GND	5	5		Signal ground
DCD	1		printer	Same as CTS



Each pin signal is defined as shown

Pin No.	Signal name	Source	Explain
2	RXD	computer	Printer receive data from computer
3	TXD	printer	Printer send control code XON/XOFF and data to computer.
5	CTS	printer	When the signal show “MARK”, it is means the printer is busy and can not receive data, when the signal show “ SPACE”, it is mean the printer get ready and can receive data..
6	DSR	printer	Signal show “ SPACE” means printer online
7	GND		Signal ground
8	DCD	printer	Same as CTS

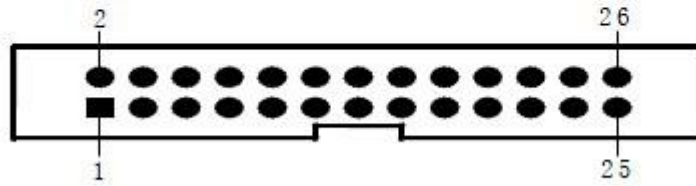
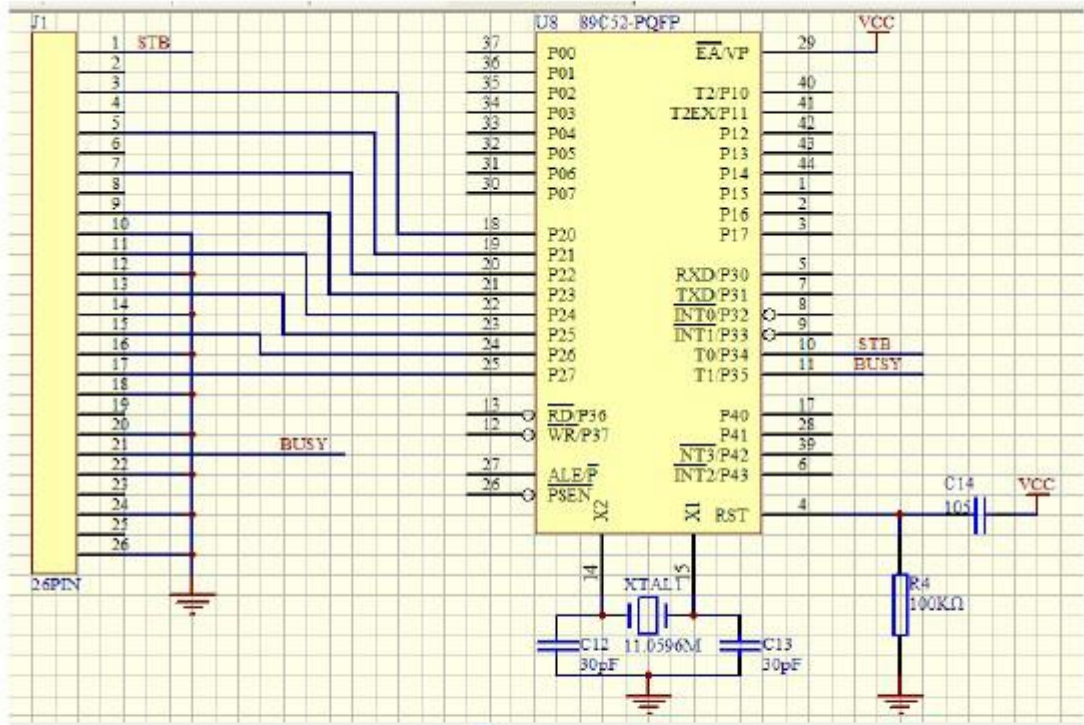
汇编程序如下:

```
□ cts      bit  p3.0          ;
      ORG 0000H
Strat: mov  tmod,#20h        ; 初始化串口
      mov  tl1,#0fdh        ; 波特率 9600
      mov  th1,#0fdh        ; 波特率 9600
      mov  scon,#0c0h       ; 模式 3
      setb tr1
main:  mov  r7,#0
      mov  dptr,#date
loop:  mov  a,r7
      movc a,@a+dptr        ; 取数
      inc  r7
      cjne a,#00h,loop1    ; 结束标志 00H
      sjmp $
loop1: call sczj
      sjmp loop
sczj:  jb  cts,$            ;判忙
      mov  c,psw.0          ;
      ;cpl c                ; 奇校验, C 反向
      mov  tb8,c            ; 偶校验
      mov  sbuf,a
      jnb ti,$             ; 等待发送结束
□
      clr  ti
      ret
date:: db 1bh,40h
      db 'sprinter rs232 test'
      db 0dh,00h
      ret
      end
```

C 程序如下:

```
#include <reg52.h>
unsigned char  inbuf1[19]="sprinter rs232 test";
sbit busy = P3^0;
void send_char_com(unsigned char ch)//向串口发送一个字
{while(busy); //判忙
//TB8=P; //偶校验
TB8=!P; //奇校验
SBUF=ch;
while(TI==0); // 等待发送结束
TI=0;
}
void send_string_com(unsigned char *str) //串口发送字符
{
unsigned int k=0;
do
{
send_char_com(*(str+k));
k++;
}while(k<19);
}
□
main()
{
SCON=0xc0; //方式 3
TMOD=0x20; //
TH1=0xfd; //波特率 9600
TR1=1;
send_char_com (0x1b);
send_char_com (0x40); //打印机初始化命令
send_string_com(inbuf1);
send_char_com (0x0a);}
```

上位机并口 I/O 口模式推荐原理图:

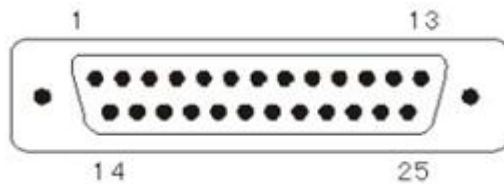


IDC26并行接口插座引脚序号

Parallel interface each cords number define shown as below:

Cords No.	Signal	Direction	Instruction
1	/STB	input	Gate trigger, rising along the read data.
3	DATA1	Input	Those signals represent the message from 1 to 8, when the logic is "1" of each signal, it is high level, logic show "0" mean low level.
5	DATA2	Input	
7	DATA3	Input	
9	DATA4	Input	
11	DATA5	Input	
13	DATA6	Input	
15	DATA7	Input	
17	DATA8	input	

19	/ACK	output	Pulse reply, "low" level mean the data has been received and printer already to receive next data.
21	BUSY	output	"high" level mean printer is "busy" can not receive data
23	/PE	output	Via resistance drop down to "low" level mean have paper
25	SEL	---	Via resistance pull up to "high" level mean printer online
4	/ERR	output	Via resistance pull up to "high" level mean no trouble
2, 6, 8	NC	---	Not connected
10, 12, 14, 16, 18, 20, 22, 24	GND	---	Ground connect, logic"0" level

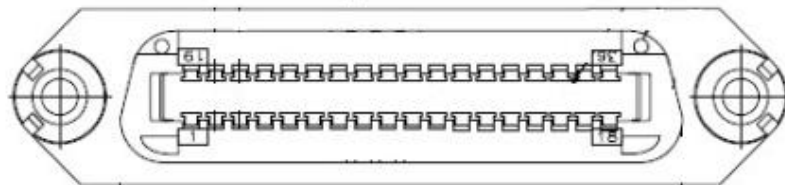


DB-25 Parallel interface

Parallel interface each cords number define shown as below:

Cords No.	Signal	Direction	Instruction
1	/STB	input	Gate trigger, rising along the read data.
2	DATA1	Input	Those signals represent the message from 1 to 8, when the logic is "1" of each signal, it is high level, logic show"0"mean low level.
3	DATA2	Input	
4	DATA3	Input	
5	DATA4	Input	
6	DATA5	Input	
7	DATA6	Input	

8	DATA7	Input	
9	DATA8	input	
10	/ACK	output	Pulse reply, "low" level mean the data has been received and printer already to receive next data.
11	BUSY	output	"high" level mean printer is "busy" can not receive data
12	/PE	output	Via resistance drop down to "low" level mean have paper
13	SEL	---	Via resistance pull up to "high" level mean printer online
15	/ERR	output	Via resistance pull up to "high" level mean no trouble
14/16/17	NC	---	Not connected
18--25	GND	---	Ground connect, logic"0" level



DB-36 Parallel interface

Parallel interface each cords number define shown as below:

Cords No.	Signal	Direction	Instruction
1	/STB	input	Gate trigger, rising along the read data.
2	DATA1	Input	Those signals represent the message from 1 to 8, when the logic is "1" of each signal, it is high level, logic show"0"mean low level.
3	DATA2	Input	
4	DATA3	Input	
5	DATA4	Input	
6	DATA5	Input	
7	DATA6	Input	

8	DATA7	Input	
9	DATA8	input	
10	/ACK	output	Pulse reply, "low" level mean the data has been received and printer already to receive next data.
11	BUSY	output	"high" level mean printer is "busy" can not receive data
12	/PE	output	Via resistance drop down to "low" level mean have paper
13	SEL	---	Via resistance pull up to "high" level mean printer online
32	/ERR	output	Via resistance pull up to "high" level mean no trouble
14, 15, 17, 18, 34, 36	NC	---	Not connected
16, 19-30, 33	GND	---	Ground connect, logic"0" level

汇编程序如下:

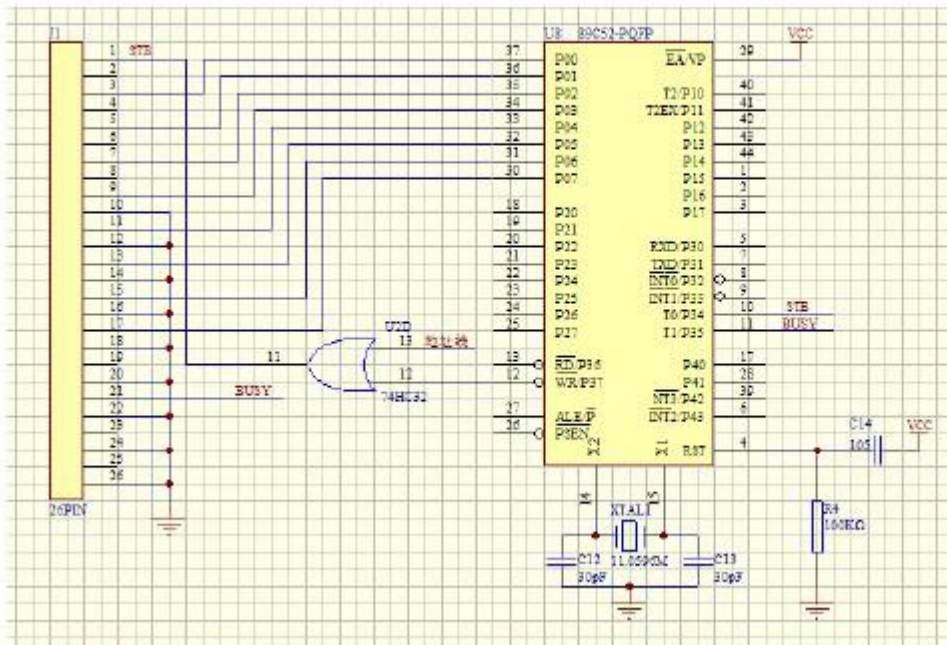
```
        STB      bit    p3.4
        BUSY     BIT    P3.5
        PDATA    BIT    P2
                ORG 0000H

strat:
        LOOP:MOV DPTR,#DATE
        LOOP1:CLR A
            MOVC A,@A+DPTR
            CJNE A,#00H,GO1 ; 打印机结束标志
            SJMP LOOP
        GO1:LCALL PRINT
            INC DPTR
            SJMP $
PRINT:PUSH DPH
        PUSH DPL
            JB  BUSY,$ ; 判忙
            MOV P2,A
            CLR STB ; 送 STB 上升沿
            NOP
            NOP
            NOP
            SETB STB
            NOP
            NOP
            NOP
            POP DPL
            POP DPH
            RET
date: db 1bh,40h
      db 'sprinter test ok'
      db 0dh,00h
      ret
```

C 语言程序如下:

```
#include <reg52.h>
#include <intrins.h>
unsigned char inbuf1[16]="sprinter test ok";
sbit busy = P3^5;
sbit STB=P3^4;
#define P_DATA P2
void send_char_P(unsigned char ch)//向并口发送一个字符
{
    while(busy); //判忙
    P2=ch;
    STB=0; //STB 上升沿
    _nop_(); //调整 STB 脉冲
    _nop_();
    _nop_();
    _nop_();
    STB=1;
    _nop_();
    _nop_();
    _nop_();
    _nop_();
}
void send_string_P(unsigned char *str) //串口发送字符串
{
    unsigned int k=0;
    do
    {
        send_char_P(*(str+k));
        k++;
    }while(k<16);
}
main()
{
    send_char_P(0x1b);
    send_char_P(0x40);
    send_string_P(inbuf1);
    send_char_P(0x0a);
}
```

上位机并口总线模式推荐原理图:



汇编程序如下: .

```

        wrdata    EQU    **H ; 打印机地址
        BUSY     BIT    P1.0
                ORG 0000H
strat:  mov  r7,#0
        mov  dptr,#date
loop:  mov  a,r7
        movc a,@a+dptr
        inc r7
        cjne a,#00h,loop1
        sjmp strat ; 循环发送
loop1: call PRINT
        sjmp loop
PRINT:  PUSH DPH
        PUSH DPL
        JB  BUSY, $ ; 判忙
        MOV DPTR,#wrdata
        MOVX @DPTR,A
        POP DPL
        POP DPH
        RET

date:  db 1bh,40h
        db 'sprinter test ok'
        db 0dh,00h
        ret
    
```

C 语言如下:

```

#include <reg52.h>
#include <intrins.h>
unsigned char  inbuf1[16]="sprinter test ok";
sbit busy = P1^0;
unsigned char  xdata wrchar_at_0x** // **定义绝对地址
void send_char(unsigned char ch) //并口发送一个字节
{
    while(busy); //判忙
    wrchar=ch;
}
void send_string_P(unsigned char *str) //并口发送字符串
{
    unsigned int k=0;
    do
    {
        send_char(*(str+k));
        k++;
    }while(k<16);
}
main()
{
    send_char(0x1b);
    send_char(0x40);
    send_string_P(inbuf1);
    send_char(0x0a);
}
    
```