COMMANDS OF OPOZ5080 PRINTER

HT n – Set horizontal tab

ACSII HT n

Hex   [09H] n

Decimal [9] n

Description: Set the Horizontal tab position according to the command of <ESC D>,

    Print the tab character n on the next horizontal tab position.

    n = any character of ACSII. If the current setting tabs are excess the last tab position, this

    command will be ignored.

LF – Print and feed paper

ACSII LF

Hex   [OAH]

Decimal [10]

Description: Prints the data in the print buffer and feeds one line based on the current spacing.

FF－Print and feed paper

ASCII FF

Hex   [0C]

Decimal [12]

Description: Prints the data in the print buffer and return to the standard mode when it under leaf mode;

    Prints the data in the print buffer and feeds one line when it under standard mode.

Note: • Clear buffer after print.

    • This command cann't control the cutter.

    • This command will set the position at the head of this line.

CR – Print and carriage return

ACSII CR

Hex   [0DH]

Decimal [13]

Description: Prints the data in the print buffer and does not feed the paper.

Reference LF

CAN Clear buffer and without print under leaf mode.

ASCII CAN

Hex   [18H]

Decimal [24]

Description: Clear buffer and without print when under leaf mode.

Note   • This command is available onle under leaf mode.

    • If there are some part lad over with the formerly enactment, than it will be delect.

Reference ESC L,ESC W

DLE EOT n－ real time transmission

ASCII	DLE	EOT	n
Hex	[10H]	[04H]	n
Decimal	[16]	[4]	n
Range	1≤n≤4		

Description: This command is valid for the printer with serial interface. Transmits the selected printer status specified by n in real time. The range of n should be in 1～4, according to the n the printer status is described as follows: n=1: Transmit printer status n=2: transmit offline status n=3: transmit error status n=4: transmit paper roll sensor status Do not use this command within multibyte command. For example: If you attempt to send the command ESC j n to the printer, but DRT goes to MARK before n is transmitted and then DLE EOT 3 interrupts before n is received, the printer will process the first bit <10>H of DLE ELT 3 as ESC J <10>H and will not respond to the command DLE EOT 3. When the printer receives the command DLE EOT n, it sends the status bit to the host immediately without confirming whether the host computer can receive data. The printer return the status bit even when the printer is offline, the receive buffer is full or an error occurs. n indicates the status function as follows:

n=1 Printer status

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Not in use
1	1	02	2	Not in use
2	0	00	0	One or two cash drawer opened
	1	04	4	Both two cash drawers were closed
3	0	00	0	Online
	1	08	8	Offline
4	1	10	16	Not in use
5,6				Not defined
7	0	00	00	Not in use

n=2: Offline status

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Not in use
1	1	02	2	Not in use
2	0	00	0	Upper cover closed
	1	04	4	Upper cover opened
3	0	00	0	Not press the feed button
	1	08	8	The feed button pressed
4	1	10	16	Not in use
5	0	00	0	With paper
	1	20	32	Out of paper
6	0	00	0	Working order
	1	40	64	There is something wrong

| 7 | 0 | 00 | 0 | Not in use |

n=3: Wrong status

Bit	0/1	HEX	Decimal	Function
0	0	00	0	Not in use
1	1	02	2	Not in use
2	-	-	-	Not defined
3	0	00	0	Working order
	1	08	8	Something wrong with the cutter
4	1	10	16	Not in use
5	0	00	0	Working order
	1	20	32	With something wrong beyond retrieve
6	0	00	0	Working order
	1	40	64	The temperature or the working voltage is out of the range
7	0	00	0	Not in use

n=4: Paper sensor status

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Not in use
1	1	02	2	Not in use
2,3	0	00	0	With paper
	1	0C	12	Paper will out
4	1	10	16	Not in use
5,6	0	00	0	With paper
	1	60	96	Out of paper
7	0	00	0	Not in use

Reference   DLE ENQ,GS a,GS r

DLE ENQ n－Real time request to the host

ASCII	DLE	ENQ	n
Hex	[10H]	[05H]	n
Decimal	[16]	[5]	n

Range $1 \leqslant n \leqslant 2$

Description   This command is valid for the printer with serial interface (POS58IIS). The printer request to the host specified by n in real time. N indicate the status function：

n=1, exit from where the error occur, restart the printing；

n=2, clear the data in the printer buffer and restart

This command is valid when auto-cutter error occurred、black mark detect error occurred or the printer head handle is raised.   Printer request to the host even when the printer is offline, the receive buffer is full or any error occurs. This command may be invalid when used within multibyte command.

For example: If you attempt to send the command ESC j n to the printer, but DTR goes to

MARK before n is transmitted then DLE ENQ 1 interrupts before n is received, the printer will process the first bit <10>H of DLE ELT 3 as ESC J <10>H and will not respond the command DLE ENQ 1. Command DLE ENQ 2 enable the printer to recover from an error after clearing the data in the receive buffer and the print buffer. The printer retains the settings (by ESC!,ESC3,etc.) that were in effect when the error occurred. This command is enabled only for errors that have the possibility of recovery, except for print head is overheated.

DLE DC4 n m t－Generate pulse at real-time

ASCII	DLE	DC4	n	m	t
Hex	[10H]	[14H]	n	m	t
Decimal	[16]	[20]	n	m	t
Range	n=1；m=0,1；1≤t≤8				

Description   Outputs the pulse specified by t to connector pin m as follows: When m=0, drawer kick-out by connector pin 2; When m=1, drawer kick-out by connector pin 5; The pulse on time is [t x 100 ms] and the off time is [t x 100ms].

Notes   When the printer is in an error status when this command is processed, this command is ignored. When the pulse is output to the connector pin specified while ESC p or DEL DC4 is executed while this command is processed, this command is ignored. The printer executes this command upon receiving it. With a serial interface model, this command is executed even when the printer is off-line, the receive buffer is full, or there is an error status. With a parallel interface model, this command cannot be executed when the printer is busy. This command is executed even when the printer is off-line or there is an error status when DIP switch 2-1 is on. If print data includes the same character strings as this command, the printer performs the same operation specified by this command. The user must consider this. This command should not be used within the data sequence of another command that consists of 2 or more bytes. This command is effective even when the printer is disabled with ESC = (Select peripheral device).

Reference   ESC p

ESC FF－Print data in page mode

ASCII	ESC	FF
Hex	[1BH]	[0CH]
Decimal	[27]	[12]

Description   In page mode, prints all buffered data in the printable area collectively.

Note   • This command is enabled only in page mode.
       • After printing, the printer does not clear the buffered data, setting value for ESC T and ESC W, and the position for buffering character data.

Reference   FF,ESC L,ESC S

ESC SP n－Set intercharacter space

ASCII	ESC	SP	n
Hex	[1BH]	[20H]	n
Decimal	[27]	[32]	n
Range	0≤n≤255		
Description	ESC SP n sets the character spacing for the right side of the character to [n x (horizontal or vertical motion units)].		
Notes	• The right-side character spacing is [n x (horizontal or vertical motion unit)] inches.		
	• This command sets values independently in each mode (standard and page modes).		
	• The horizontal and vertical motion units are specified by "GS P". Changing the horizontal or vertical motion units does not affect the current right-side spacing. The "GS P" command can change the horizontal (and vertical) motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.		
	• In standard mode, the horizontal motion unit is used.		
	• The horizontal or vertical motion unit differs in page mode, de pending on the starting position of the printable area as follows : When the starting position is set to the upper left or lower right of the printable area using "ESC T", the horizontal motion unit (x) is used. When the starting position is set to the upper right or lower left of the printable area using "ESC T", the vertical motion unit (y) is used.		
	• Any setting exceeding the maximum is converted to the maximum automatically.		
Default	n=0		
Reference	GS P		

ESC ! n－Select print mode(s)

ASCII	ESC	!	n
Hex	[1BH]	[21H]	n
Decimal	27	33	n
Range	0≤n≤255		
Description	Selects print modes using n as follows:		

Bit	1/0	HEX	Decimal	Function
0	0	00	0	Character font (12x24) selected.
	1	01	1	Character font (7 x 9) selected.
1,2				Undefined.
3	0	00	0	Emphasized mode not selected.
	1	08	8	Emphasized mode selected.
4	0	00	0	Double-height mode not selected.
	1	10	16	Double-height mode selected.
5	0	00	0	Double-width mode not selected.
	1	20	32	Double-width mode selected.
6				Undefined.
7	0	00	0	Underline mode not selected.

	1	80	128	Underline mode selected.

Note
- When both double-height and double-width modes are selected, quadruple size characters are printed.
- The printer can underline all characters, but cannot underline the space set by "HT" or 90° clockwise-rotated characters.
- The thickness of the underline is selected by "ESC-", regardless of the character size.
- When some characters in a line are double or more height, all the characters on the line are aligned at the baseline.
- "ESC E" Can also turn on or off emphasized mode. However, the setting of the last received command is effective.
- "ESC -" Can also turn on or off underline mode. However, the setting of the last received command effective.
- "GS !" Can also select character size, However, the setting of the last received command is effective.

Default   n=0

Reference   ESC -,ESC E,GS !

ESC $ nL nH－Set absolute print position

ASCII   ESC $ nL   nH

Hex   [1BH]   [H24]   nL   nH

Decimal   27   36   nL   nH

Range   0≤nL≤255；0≤nH≤2

Description   Sets the distance from the beginning of the line to the position at which subsequent characters are to be printed.

Note
- The distance from the beginning of the line to the print position is [(nL + nH x 256) x (vertical or horizontal motion unit)] inches.
- The "GS P" command can change the horizontal (and vertical) motion unit.
- However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount. In standard mode, the horizontal motion unit is used.
- The horizontal or vertical motion unit differs in page mode, depending on the starting position of the printable area as follows : When the starting position is set to the upper left or lower right of the printable area using "ESC T", the horizontal motion unit (x) is used. When the starting position is set to the upper right or lower left of the printable area using "ESC T", the vertical motion unit (y) is used.

Reference   ESC \,GS $,GS \,GS P

ESC % n－Select/cancel user-defined character set

ASCII   ESC   %   n

Hex   [1BH]   [25H]   n

Decimal   27   37   n

Range   0≤n≤255

Description	Selects or cancels the user-defined character set

Description Selects or cancels the user-defined character set
- When the LSB of n is 0, the user-defined character set is canceled.
- When the LSB of n is 1, the user-defined character set is selected.

Note
- When the user-defined character set is canceled, the internal character set is automatically selected.
- n is available only for the least significant bit.

Default n=0

Reference ESC &,ESC ?

ESC & y c1 c2 [x1 d1...d(y $\times$ x1)]...[xk d1...d(y $\times$ xk)]－Define user-defined characters

ASCII ESC & y c1 c2 [x1 d1...d(y $\times$ x1)]...[xk d1...d(y $\times$ xk)]

Hex [1BH] [26H] y c1 c2 [x1 d1...d(y $\times$ x1)]...[xk d1...d(y $\times$ xk)]

Decimal 27 38 y c1 c2 [x1 d1...d(y $\times$ x1)]...[xk d1...d(y $\times$ xk)]

Range y = 3

$32 \leqslant c1 \leqslant c2 \leqslant 126$

$0 \leqslant x \leqslant 12$ Font A (12 x 24)

$0 \leqslant x \leqslant 9$ Font B (9 x 17)

$0 \leqslant d1 ... d(y \times xk) \leqslant 255$

Description Defines user-defined characters
- y specifies the number of bytes in the vertical direction.
- c1 specifies the beginning character code for the definition, and c2 specifies the final code.
- X specifies the number of dots in the horizontal direction.

Note • The allowable character code range is from ASCII code <20>H to <7E>(95characters).
- It is possible to define multiple characters for consecutive character codes. If only one character is desired, use c1 = c2.
- d is the dot data for the characters. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.
- The data to define a user-defined character is (y ´ x) bytes.
- Set a corresponding bit to 1 to print a dot or 0 to not print a dot. This command can define different user-defined character patterns by each fonts. To select a font, use ESC !
- A user-defined character and a downloaded bit image cannot be defined simultaneously. When this command is executed, the downloaded bit image is cleared. The user-defined character definition is cleared when:
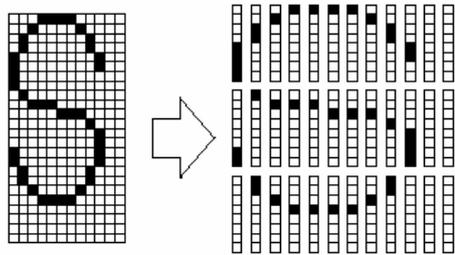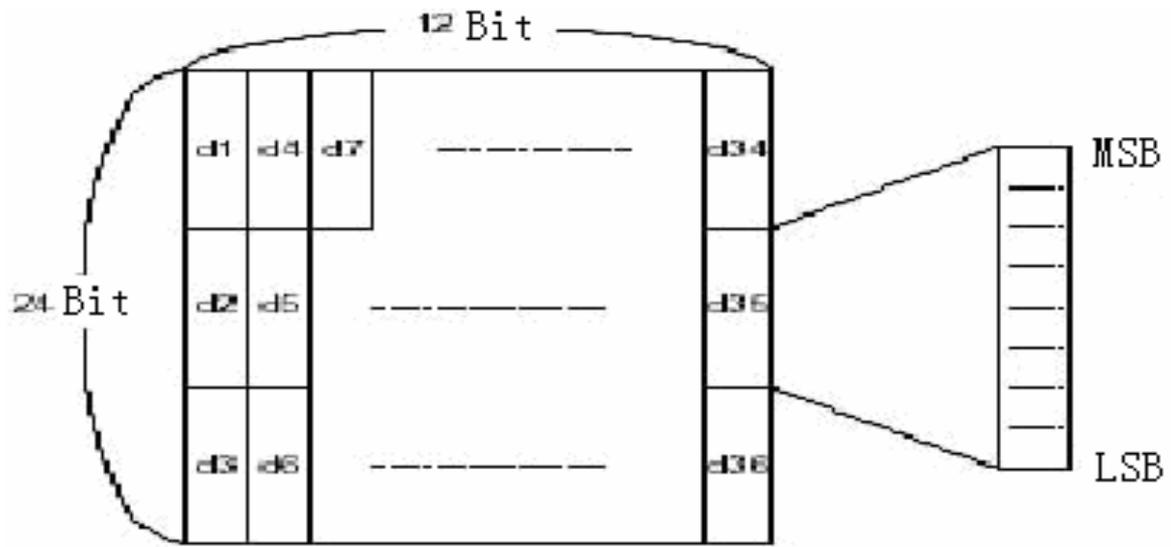 ① ESC @ is executed.
  ② ESC ? is executed.
  ③ The printer is reset or the power is turned off.
  When the user-defined characters are defined in font B (9 ´ 17), only the most significant bit of the 3rd byte of data in vertical direction is effective.

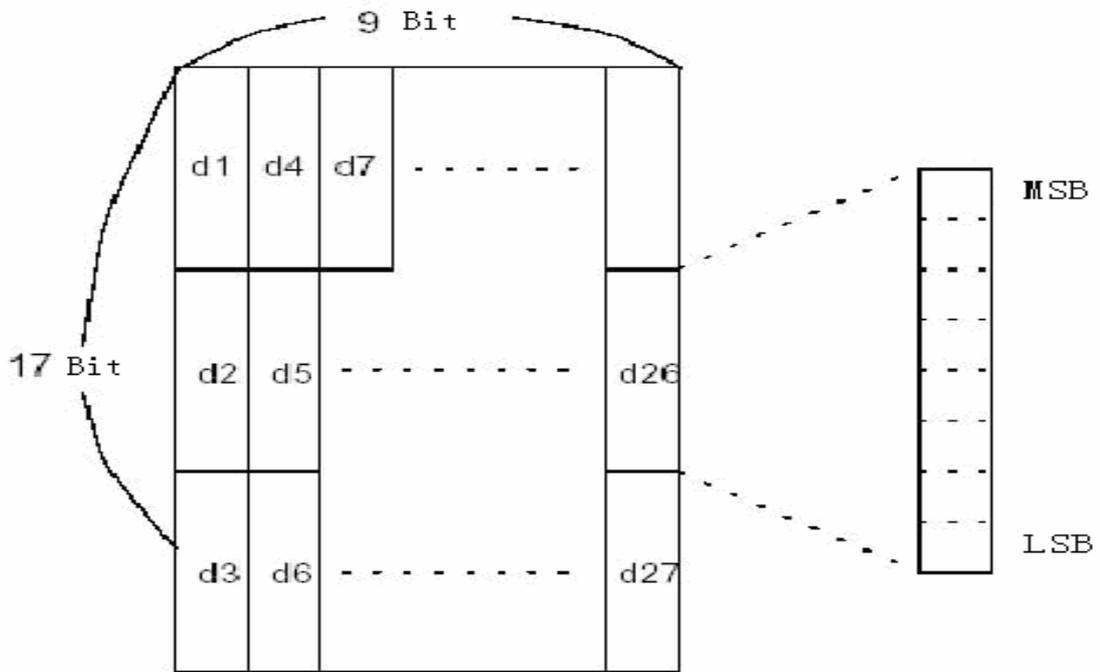Default The internal character set
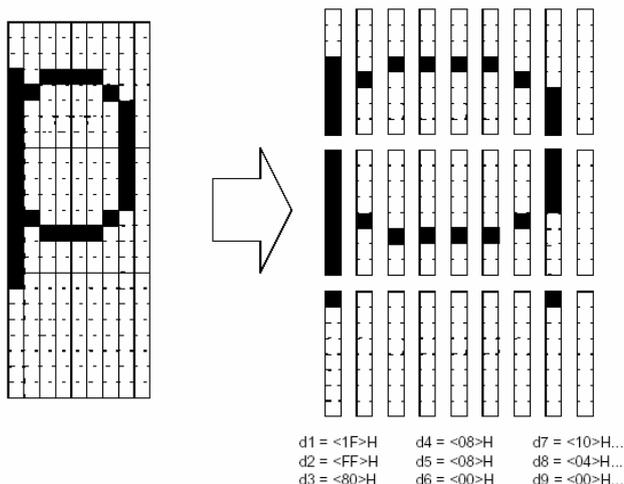
Reference ESC %,ESC ?

Example   When font A (12 x 24) is selected:

d1= <0F>H   d4 = <30>H   d7 = <40>H . . . .
d2 = <03>H d5 = <80>H   d8 = <40>H . . . .
d3 = <00>H d6 = <00>H   d9 = <20>H . . . .

When font A (12 x 24) is selected:

d1 = <1F>H   d4 = <08>H   d7 = <10>H...
d2 = <FF>H   d5 = <08>H   d8 = <04>H...
d3 = <80>H   d6 = <00>H   d9 = <00>H...

ESC * m nL nH d1...dk－Select bit-image mode

ASCII	ESC	*	m	nL	nH	d1...dk
Hex	[1BH]	[2AH]	m	nL	nH	d1...dk
Decimal	27	42	m	nL	nH	d1...dk

Range   m=0,1,32,33；0≤nL≤255；0≤nH≤3；0≤d≤255

Description   Selects bit-image mode using m for the number of dots specified by (nL+ nH, x 256).

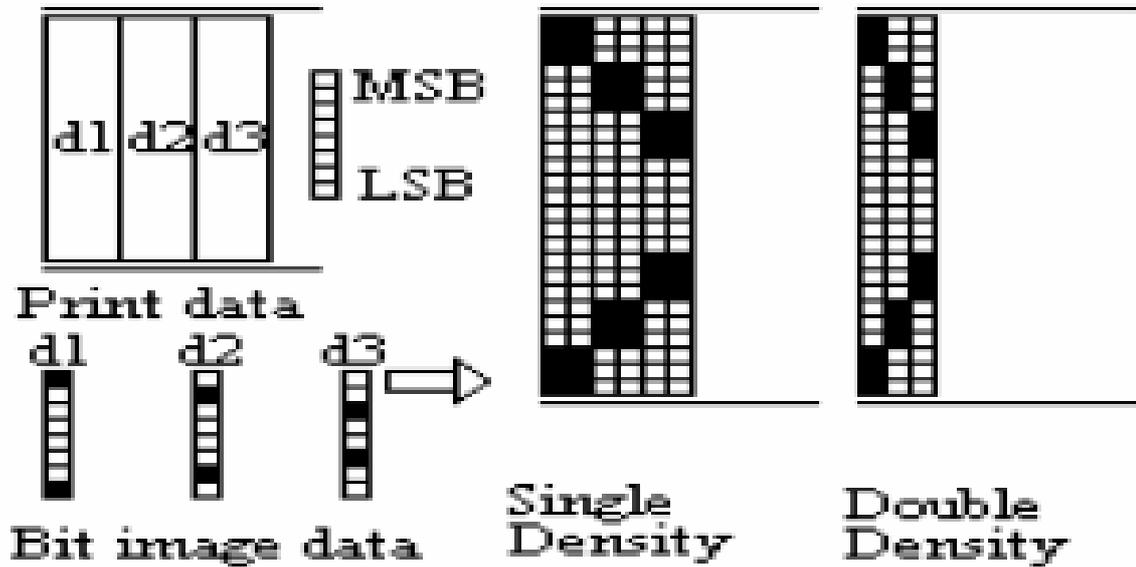This command is used to print a predefined picture or logo.

The modes selectable by m are follows;

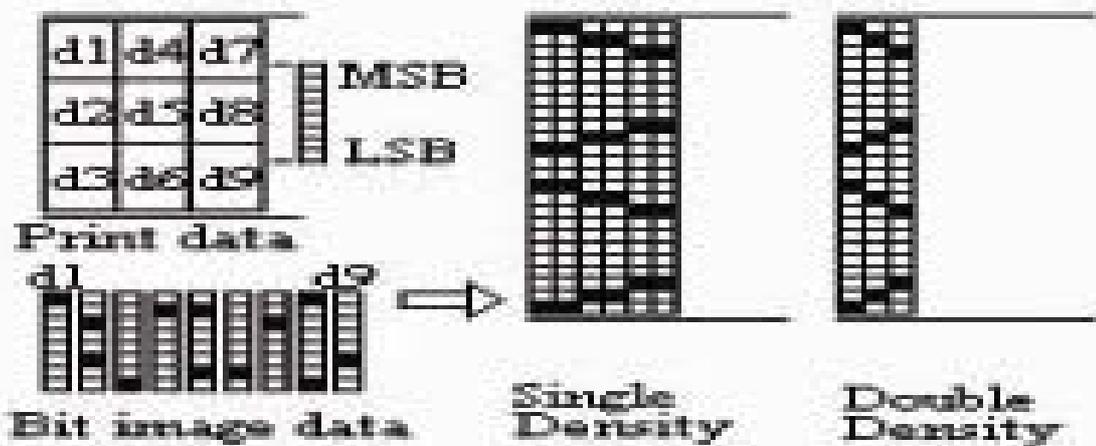| m	Mode	Vertical Direction		Horizontal Direction	
		NO. of Dots	Dot Density	Dot Density	Number of Data (K)
0	8-dot single-density	8	67DPI	100DPI	nL+nH×256
1	8-dot double-density	8	67DPI	200DPI	nL+nH×256
32	24-dot single-density	24	200DPI	100DPI	(nL+nH×256)×3
33	24-dot double-density	24	200DP	200DPI	(nL+nH×256)×3

Note   • The nL and nH indicate the number of dots of the bit image in the horizontal direction.

- The number of dots is calculated by nL + nH x 256.
- If the bit-image data input exceeds the number of dots to be printed on a line, the excess data is ignored.
- d indicates the bit-image data. Set a corresponding bit of 1 to print a dot or to 0 to not print a dot.
- If the value of m is out of the specified range, nL and data following are processed as normal data.
- This command is not affected by print modes (emphasized, double-strike, and underline etc.), except upside-down mode
- The relationship between the image data and the dots to be printed is as follows：

8 dot Bit image

Print data

Bit image data — Single Density — Double Density

24 dot Bit image

Print data

Bit image data — Single Density — Double Density

ESC － n--Turn underline mode on/off

ASCII	ESC	-	n
Hex	1BH	2DH	n
Decimal	27	45	n

Range   0≤n≤2,48≤n≤50

description   Turns underline mode on or off, based on the following values of n.：

n	Function
0,48	Turns off underline mode
1,49	Turns on underline mode (1-dot thick)

2,50	Turns on underline mode (2-dots thick)

Note
- The printer an underline all characters (including right-side character spacing), but cannot underline the space set by "HT".
- The printer cannot underline 90° clockwise rotated characters and white/black inverted characters.
- When underline mode is turned off by setting the value of n to 0 or 48, the following data is not underlined, and the underline thickness set before the mode is turned off does not change.
- The default value thickness is 1 dot. Changing the character size does not affect the current underline thickness.
- Underline mode can also be turned on or off by using "ESC !". Note, however, that the last received is effective.

Default   n=0

Reference   ESC !

ESC 2--Select 1/6-inch line spacing

ASCII   ESC   2

Hex   1BH   32H

Decimal   27   50

description   ESC 2 sets the line spacing to 1/6 of an inch.

Note   The line spacing can be set independently in standard mode and in page mode.

Reference   ESC 3

ESC 3 n--Set line spacing

ASCII   ESC   3   n

Hex   1BH   33H   n

Decimal   27   51   n

Range $0 \leq n \leq 255$

description   ESC 3 n sets the line spacing to [n x (vertical or horizontal motion unit)] inches.

Note
- The line spacing can be set independently in standard mode and in page mode.
- The horizontal and vertical motion unit is specified by "GS P". Changing the horizontal or vertical motion unit does not affect the current line spacing.
- In standard mode, the vertical motions until (y) is used.
- This command function as follows in page mode, depending on the starting position of the printable area : When the starting position is set to the upper left or lower right to the printable area using "ESC T", the vertical motion unit (y) is used. When the starting position is set to the upper right or lower left of the printable area using ESC T, the horizontal motion unit (x) is used.
- The maximum line spacing is 40 inches. When the setting value exceeds the maximum, it is converted to the maximum automatically.

Default   The default setting of the paper feed amount is 1/6 inch.

Reference   ESC 2,GS P

ESC = n--Set peripheral device

ASCII	ESC	=	n
Hex	1BH	3DH	n
Decimal	27	61	n

Range   0≤n≤1

description   Selects device to which host computer sends data, using n as follows:

Bit	1/0	Hex	Decimal	Function
0	0	00	0	Printer disabled
	1	01	1	Printer enabled
1-7				Undefined

Note   • When the printer is disabled, it ignores all data except for error-recovery commands (DLE EOT,DLE ENQ, DLE DC4) until it is enabled by this command.

Default   n=1

ESC ? n--Cancel user-defined characters

ASCII	ESC	?	n
Hex	1BH	3FH	n
Decimal	27	63	n

Range   32≤n≤127

description   Cancels user-defined characters.

Note   • This command cancels the pattern defined for the character code specified by n. After the user-defined characters is canceled, the corresponding pattern for the internal character is printed.   This command deletes the pattern defined for the specified code in the font selected by ESC !.

          • If a user-defined character has not been defined for the specified character code, the printer ignores this command.

Reference   ESC &,ESC %

ESC @--Initialize printer

ASCII	ESC	@
Hex	1BH	40H
Decimal	27	64

description   ESC @ is initializes the printer, and all settings, including character font and line spacing settings, are canceled.

Note   • DIP setting won't be inspect again.

          • The data in receive buffer is not cleared.

          • Keep the Macro setting.

ESC D n1...nk NUL--Set horizontal tab positions

ASCII	ESC	D	n1...nk	NUL
Hex	1BH	44H	n1...nk	00
Decimal	27	68	n1...nk	0

Range   1≤n≤255；0≤k≤32

description   Set is horizontal tab positions.

          • "n" specifies the column number for setting a horizontal tab position from the

beginning of the line.

- ”k” indicates the total number of horizontal tab positions to be set.

Note
- The horizontal tab position is stored as a value of [character width x n] measured from the beginning of the line.
- This command cancels the previous horizontal tab settings.
- When setting n = 8, the print position is moved to column 9 by sending "HT".
- Up to 32 tab positions (k=32) can be set. Data exceeding 32-tab positions is processed as normal data.
- Transmit [n]k in ascending order and place a NUL code 0 at the end.
- When [n]k is less than or equal to the preceding value [n]k-1, tab setting is finished and the following data is processed as normal data.
- "ESC D NUL" cancels all horizontal tab positions.
- The previously specified horizontal tab positions do not change. even if the character width changes.

Default
The default tab positions are at intervals of 8 characters (columns 9, 17, 25, ...) for the font A (12 X 24).

Reference
HT

ESC E n--Turn emphasized mode on/off

ASCII	ESC	E	n
Hex	1BH	45H	n
Decimal	27	69	n

Range $0 \leqslant n \leqslant 255$

description   When n = <......1>B, the emphasized characters are selected.

When n = <......0>B, the emphasized characters are canceled.

Note
- Only the lowest bit of n is valid.
- "ESC !" Also turns on and off emphasized mode. However, the last received command is effective.

Default   n=0

Reference   ESC!

ESC G n--Select/cancel double-strike mode

ASCII	ESC	G	n
Hex	1BH	47H	n
Decimal	27	71	n

Range $0 \leqslant n \leqslant 255$

description   Select/cancel is double-strike mode.   This command is available for all character types.

- When n = <......1>B, the double-strike mode is selected.
- When n = <......0>B, the double-strike mode is canceled.

Note
- Only the lowest bit of n is valid.
- In this printer, double- strike mode has the same function as emphasized mode.

Default   n=0

Reference   ESC E

ESC J n--Print and feed paper

ASCII   ESC   J   n
Hex   1BH   4AH   n
Decimal   27   74   n
Range   0≤n≤255
description ESC J n Prints the data in the print buffer and feeds the paper [n x (vertical or horizontal motion unit) inches.
Note   · After printing is completed, this command sets the print starting position to the beginning of the line.
            · The paper feed amount set by this command does not affect the values set by "ESC 2" or "ESC 3".
            · In standard mode, the printer uses the vertical motion unit.
            · The horizontal and vertical motion unit is specified by "GS P".
            · The "GS P" command can change the vertical (and horizontal) motion unit.
            · When this command is used in page mode, the command functions as follows, depending on the starting position of the printable area:
              When the starting position is set to the upper left or lower right of the printable area using "ESC T", the vertical motion unit (y) is used.
              When the starting position is set to the upper right or lower left of the printable area using "ESC T", the horizontal motion unit (x) is used.
            · The maximum paper feed amount is 40 inches. Even if a paper feed amount of more than 40 inches is set, the printer feeds the paper only 40 inches.
Reference   GS P

ESC L--Select page mode

ASCII   ESC   L
Hex   1BH   4CH
Decimal   27   76
description Select from standard mode to page mode.
Note   · This command is enabled only when input at the beginning of a line.
            · This command has no affect in page mode.
            · After printing by FF is completed or by using ESC S, the printer returns to standard mode.
            · This command sets the position where data is buffered to the position specified by ESC T within the printing area defined by ESC W.
            · This command is switches the setting for the following commands (in which the values can be set independently in standard mode and page mode) to those for page mode:
              ① Set right-side character spacing: ESC SP
              ② Select 1/6-inch line spacing: ESC 2
              ③ Set line spacing: ESC 3
            · Setting for the following commands are effective only in page mode:
              ① Turn 90° clockwise rotation mode on/off: ESC V

② Select justification: ESC a

③ Turn upside-down printing mode on/off: ESC {

④ Set left margin: GS L

⑤ Set printable area width: GS W   The printer returns to standard mode by using the ESC @.

   • The printer returns to standard mode by using the ESC @.

Reference   FF,CAN,ESC FF,ESC S,ESC T,ESC W,GS $,GS \

ESC M n--Select character font

ASCII	ESC	M	n
Hex	1BH	4DH	n
Decimal	27	77	n
Range	n=0,1,2,3,48,49,50,51		
description	Selects chatacter fonts		

n	Function
0,48	Character font A(12 X 24) Selected
1,49	Character font B(9 X 24) Selected
2,50	user-defined font selected
3,51	Chinese font (24 × 24) selected

ESC S--Select standard mode

|		
ASCII	ESC	S
Hex	1BH	53H
Decimal	27	83
description	Select from page mode to standard mode.	

Note   • This command is effective only in page mode.

   • Data buffered in page mode and the printable area developed in page mode are cleared.

   • This command sets the print position to the beginning of the line.

   • This command is switches the setting for the following command (in which the values can be set independently in standard mode and page mode) to those for standard mode:

① Set right-side character spacing: ESC SP

② Select 1/6-inch line spacing: ESC 2

③ Set line spacing: ESC 3

   • Setting for the following commands are effective only in standard mode:

① Select print direction in page mode: ESC T

② Set printing area in page mode: ESC W

   • The printer will change to standard mode after used the "ESC @" command or reset the printer by hardware.

Reference   FF,ESC FF,ESC L

ESC T n--Select print direction in page mode

ASCII	ESC	T	n

Hex	1BH	54H	n
Decimal	27	84	n
Range	0≤n≤3；48≤n≤51		
description	Select the print direction and starting position in page mode.		
	n specifies the print direction and starting position as follows:		
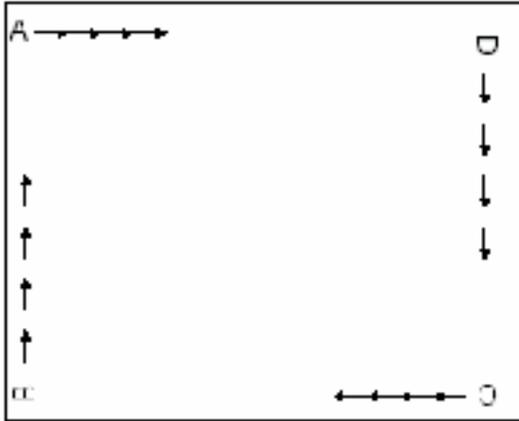
n	Print Direction	Starting Position
0,48	Left to right	Upper left(A in the figure)
1,49	Bottom to top	Lower left(B in the figure)
2,50	Right to left	Lower right(C in the figure)
3,51	Top to bottom	Upper right(D in the figure)

Note
• When the command is input in standard mode, the printer executes only internal flag operation. This command does not affect printing in standard mode.

• This command sets the position where data is buffered within the printing area set by ESC W.

• Parameters for horizontal or vertical motion units (x or y) differ as follow, depending on the starting position of the printing area:

① If the starting position is the upper left or lower right of the printing area, data is buffered in the direction perpendicular to the paper feed direction.

Commands using horizontal motion units: ESC SP, ESC $, ESC \

Commands using vertical motion units: ESC 3, ESC J, GS $, GS \

② If the starting position is the upper right or lower left of the printing area, data is buffered in the paper feed direction:

Commands using horizontal motion units: ESC 3, ESC J, GS $, GS \

Commands using vertical motion units: ESC SP, ESC $, ESC \

Default   n=0

Reference   ESC $,ESC L,ESC W,ESC \,GS $,GS P,GS \

ESC V n--Turn 90° clockwise rotation mode on/off

ASCII	ESC	V	n
Hex	1BH	56H	n
Decimal	27	86	n
Range	0≤n≤1,48≤n≤49		

description   Turns 90° clockwise rotation mode on or off.

n specified as follow:

n	Function
0，48	90° CW rotated characters mode canceled
1，49	90° CW rotated characters mode selected

Note   • This command is effective only in standard mode.
- When underline mode is turned on, the printer does not underline 90° clockwise-rotated characters.
- Double-width and double-height commands in 90° rotation mode enlarge characters in the opposite directions from double height and double-width commands in normal mode.

Default   n=0

Reference   ESC !，ESC -

ESC W xL xH yL yH dxL dxH dyL dyH-- Set printing area in page mode

ASCII   ESC   W   xL xH yL yH dxL dxH dyL dyH

Hex   1BH   57H   xL xH yL yH dxL dxH dyL dyH

Decimal   27   87   xL xH yL yH dxL dxH dyL dyH

Range   0≤xL,xH,yL,yH,dxL,dxH,dyL,dyH≤255(除过 dxL=dxH=0 或 dyL=dyH=0)

Description • The horizontal starting position, vertical starting position, printing area width, and printing area height are defined as x0, y0, dx(inch),dy(inch), respectively.   Each setting for the printable area is calculated as follow:

$x0 = [(xL + xH \times 256) \times (horizontal\ motion\ unit)]$

$y0 = [(yL + yH \times 256) \times (vertical\ motion\ unit)]$

$dx = [(dxL + dxH \times 256) \times (horizontal\ motion\ unit)]$

$dy = [(dyL + dyH \times 256) \times (vertical\ motion\ unit)]$

Note   • If this command is input in standard mode, the printer executes printing in standard mode.
- If the horizontal or vertical starting position is set outside the printable area, the printer stops command processing and processes the following data as normal data.
- If the printing area width or height is set to 0, the printer stops command processing and processes the following data as normal data.
- This command sets the position where data is buffered to the position specified by ESC T within the printing area.
- If "horizontal starting position" + "printing area width" exceeds the printable area, the printing area width is a automatically set to "horizontal printable" – "horizontal starting position".
- If "vertical starting position" + "printing area height" exceeds the printable area, the printing area height is automatically set to "vertical printable area" – "vertical starting position".
- The horizontal and vertical motion units are specified by GS P.   Changing the horizontal or vertical motion unit does not affect the current printing area.
- Use the horizontal motion unit for setting the horizontal starting position area

width, and use the vertical motion unit for setting the vertical starting position and printing area height.

· When the horizontal starting position, vertical starting position, printing area width, and printing area height are defined as X ,Y, Dx, and Dy respectively, the printing area is set as shown in the figure below:
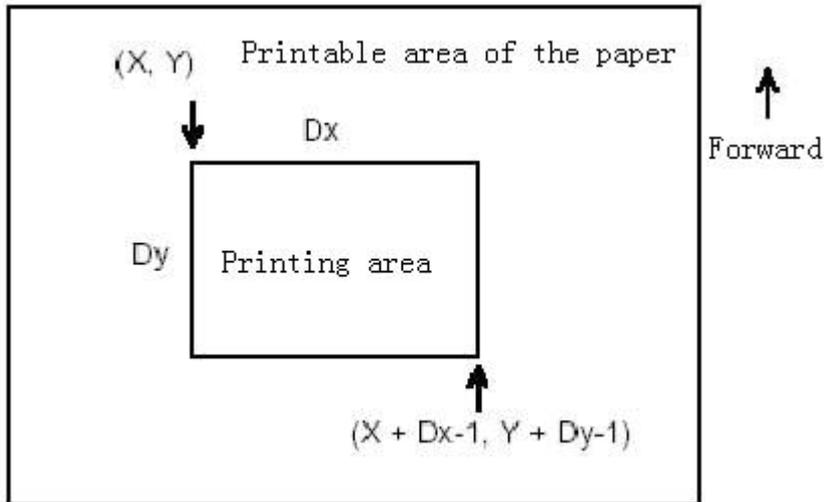
Default   xL=xH=yL=yH=0；dxL=72；dxH=2；dyL=176；dyH=4
Reference   CAN,ESC L,ESC T,GS P

ESC \ nL nH--Set relative print position

ASCII	ESC	\	nL	nH
Hex	1BH	5CH	nL	nH
Decimal	27	92	nL	nH

Range   0≤nl≤255；0≤nH≤255

description Sets the print starting position based on the current position by using the horizontal or vertical motion unit.

· This command sets the distance from the current position to [(nL+ nH x 256) x (horizontal or vertical unit)].

Note   · Any setting that exceeds the printable area is ignored.

· When pitch n is specified to the right : nL + nH x 256 = n.

· When pitch n is specified to the left (the negative direction), use the complement of 65536.

When pitch n is specified to the left : nL + nH x 256 = 65536 – n.

· The print starting position moves from the current position to [n x (horizontal or vertical motion unit)].

· The horizontal and vertical motion units are specified by "GS P".

· In standard mode, the horizontal motion unit is used.

· In page mode, the horizontal or vertical motion unit differs as follows, depending on the starting point of the printing area :

① When the starting position is set to the upper left or lower right of the printable

area using "ESC T", the horizontal motion unit (x) is used.

② When the starting position is set to the upper right or lower left of the printable area using "ESC T", the vertical motion unit (y) is used.

Reference   ESC $,GS P

ESC a n--Select justification

ASCII   ESC   a   n
Hex   1BH   61H   n
Decimal   27   97   n
Range   0≤n≤2,48≤n≤50
description   "ESC a n" aligns all the data in one line to the specified position.

n specified as follow:

n	Justification
0,48	Left justification
1, 49	Centering
2, 50	Right justification

Note   • The command is enabled only when input at the beginning of the line. This command does not affect printing in page mode.

               • If this command is input in page mode, the printer performs only internal flag operation.

               • Spaces set by "HT", "ESC $", and "ESC \" are all justified.

Default   n=0

Example:

Left justification	Centering	Right justification

```
ABC
ABCD
ABCDE
```
```
   ABC
  ABCD
 ABCDE
```
```
  ABC
 ABCD
ABCDE
```

ESC c 5 n-- Enable / disable panel buttons

ASCII   ESC   c   5   n
Hex   1BH   63H   35H   n
Decimal   27   99   53   n
Range   0≤n≤255
description   Enable / disable panel buttons.

               • When n is 0, the panel buttons are enabled.

               • When n is 1, the panel buttons are disabled.

Note   • Only the lowest bit of n is valid.

               • When the panel buttons are disabled, none of them are usable when the printer cover is closed.

               • In the Macro ready mode, the FEED button are enabled regardless of the settings of this command; however, the paper cannot be feed by using these buttons.

Default   n=0

ESC d n-- Print and feed n lines

ASCII	ESC	d	n
Hex	1BH	64H	n
Decimal	27	100	n
Range	$0 \leq n \leq 255$		
description	ESC d n prints the data in the print buffer and feeds n lines.		
Note	• This command sets the print starting position to the beginning of the line.		
	• This command does not affect the line spacing set by "ESC 2" or "ESC 3".		
	• The maximum paper feed amount is 40 inches. If the paper feed amount (n x line spacing) of more than 40 inches is specified, the printer feeds the paper only 40 inches.		
Reference	ESC 2,ESC 3		

ESC p m t1 t2--Generate pulse

ASCII	ESC	p	m	t1	t2
Hex	1BH	70H	m	t1	t2
Decimal	27	112	m	t1	t2
Range	m=0,1,48,49; $0 \leq t1 \leq 255$; $0 \leq t2 \leq 255$				
description	Outputs the pulse specified by t1 and t2 to connector pin m as follows:				

M	Connector pin
0, 48	Drawer kick-out by connector pin2.
1, 49	Drawer kick-out by connector pin5.
Note	• The pulse ON time is [t1 x 2 ms] and the OFF time is [t2 x 2 ms].
	• If t2 < t1, the OFF time is [t1 x 2 ms]
Reference	DLE DC4

ESC { n-- Set/cancel upside-down character printing

|			
ASCII	ESC	{	n
Hex	1BH	7BH	n
Decimal	27	123	n
Range	$0 \leq n \leq 255$		
description	Sets or cancels upside-down character prints.		
	• When n = <……1>B, upside-down character printing is set.		
	• When n = <……0>B, upside-down character printing is canceled.		
Note	• Only the lowest bit of n is valid.		
	• Valid only when input at the beginning of a line.		
	• When this command is input in page made, the printer performs only internal flag operations.		
	• This command is disabled in page mode; setting in page made is not affected.		
	• The upside-down character specification rotates normal characters on the line by 180° and prints them.		
Default	n=0		
Example			

Paper feed direction
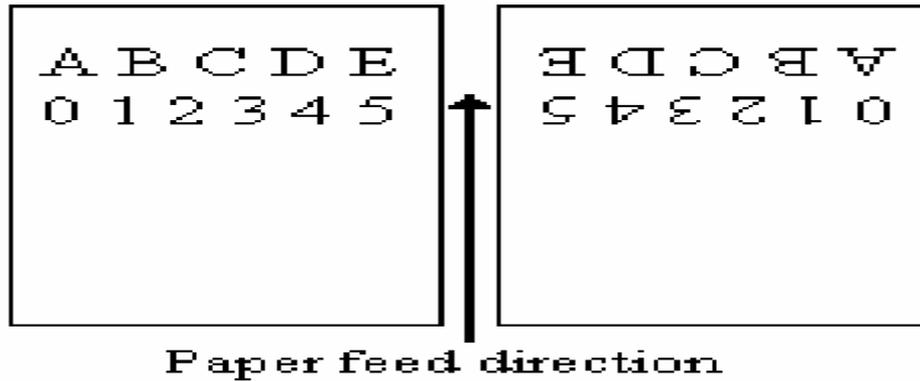
FS p n m--Print NV bit image

ASCII   FS   p   n   m
Hex   1C   70   n   m
Decimal   28   112 n   m
Range   1≤n≤2550≤m≤3,48≤m≤51
description Prints a NV bit image n using the mode specified by m.

m	Mode	Vertical Dot Density (DPI)	Horizontal Dot Density (DPI)
0.48	Normal	200	200
1.49	Double-width	200	100
2.50	Double-height	100	200
3.51	Quadruple	100	100

Description · n is the number of the NV bit image (defined using the FS q command).

· m specifies the bitmap mode.

· NV bit image means a bit image which is defined in a non-volatile memory by FS q and printed by FS p.

· This command is not effective when the specified NV bit image has not been defined.

· In standard mode, this command is effective even when there is data in the print buffer.

· This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated characters, etc.), except upside-down printing mode.

· If the downloaded bit-image to be printed exceeds one line, the excess data is not printed.

· This command feeds dots (for the height n of the NV bit-image) in normal and double-width modes and (for the height n × 2 of the NV bit-image) in double-height and quadruple modes, regardless of the line spacing specified by ESC 2 or ESC 3.

· After printing the bit image, this command sets the print position to the beginning of the line and processes the data that follows as normal data.

Reference   ESC *,FS q,GS /,GS v 0

FS q n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n--Define NV bit image

ASCII	FS	q	n[xL xH yL yH d1...dk]...[xLxH yL yH d1...dk]
Hex	1CB	71B	n[xL xH yL yH d1...dk]...[xL xH yL yH d1...dk]
Decimal	28	113	n[xL xH yL yH d1...dk]...[xL xH yL yH d1...dk]
Range			$1 \leqslant n \leqslant 255$；$0 \leqslant xL \leqslant 255$；$1 \leqslant (xL+xH \times 256) \leqslant 1023$；$1 \leqslant (yL+yH \times 256) \leqslant 288$； $0 \leqslant d \leqslant 255$；$k=(xL+xH \times 256) \times (yL+yH \times 256) \times 8$
			Total defined data area = 8096 bytes
description			Define the NV bit image specified by n:

- n specifies the number of the defined bitmap.
- xL, xH specifies (xL + xH $\times$256) $\times$8 dots in the horizontal direction for the bitmap you are defining.
- yL, yH specifies (yL + yH $\times$256) $\times$8 dots in the vertical direction for the bitmap you are defining.

Note
- Frequent write command execution may cause damage to the NV memory. Therefore, it is recommended to write the NV memory 10 times or less a day.
- This command cancels all NV bit images that have already been defined by this command. The printer can not redefine only one of several data definitions previously defined. In this case, all data needs to be sent again.
- During the processing of this command, the printer is busy to write data to NV memory and stops receiving any more commands. Therefore, before the ending of the processing of this command, do not send any other commands even real-time commands to the printer.
- NV bit image means a bit image which is defined in a non-volatile memory by FS q and printed by FS p.
- In standard mode, this command is effective only when processed at the beginning of the line.
- This command commences effective when 7 bytes <FS~yH> is processed as a normal value.
- When the amount of data exceeds the capacity left in the range defined by xL, xH, yL, yH, the printer processes xL, xH, yL, yH out of the defined range.
- In the first group of NV bit images, when any of the parameters xL, xH, yL, yH is out of the definition range, this command is disabled.
- In groups of NV bit images other than the first one, when the printer processes xL, xH, yL, yH out of the defined range, it stops processing this command and starts writing into the NV images. At this time, NV bit images that haven't been defined are disabled (undefined), but any NV bit images before that are enabled.
- The d indicates the definition data. In data (d) a 1 bit specifies a dot to be printed and a 0 bit specifies a dot not to be printed.
- This command defines n as the number of a NV bit image. Numbers rise in order from NV bit image 01H. Therefore, the first data group [xL xH yL yH d1...dk] is NV bit image 01H, and the last data group [xL xH yL yH d1...dk] is NV bit image n. The total agrees with the number of NV bit images specified by command FS p.
- A definition data of a NV bit image consists of [xL xH yL yH d1...dk]. Therefore,

when only one NV bit image is defined n=1, the printer processes a data group [xL xH yL yH d1...dk] once. The printer uses ([data: (xL + xH × 256) × (yL + yH × 256) × 8] + [header:4]) bytes of NV memory.

- The definition area in this printer is a maximum of 64K bits (8K bytes). This command can define several NV bit images, but cannot define a bit image data whose total capacity [bit image data + header] exceeds 64K bytes (8K bytes).
- The printer is busy immediately before writing into NV memory.
- During the processing of this command, the printer does not transmit status and does not respond to status inquiry as well.
- When this command is received during macro definition, the printer ends macro definition, and begins performing this command.
- Once a NV bit image is defined, it is not erased by performing ESC @, reset, and power off.
- This command performs only definition of a NV bit image and does not perform printing. Printing of the NV bit image is performed by the FS p command.

Reference   FS p

[Example]   当 xL=64,xH=0,yL=96,yH=0
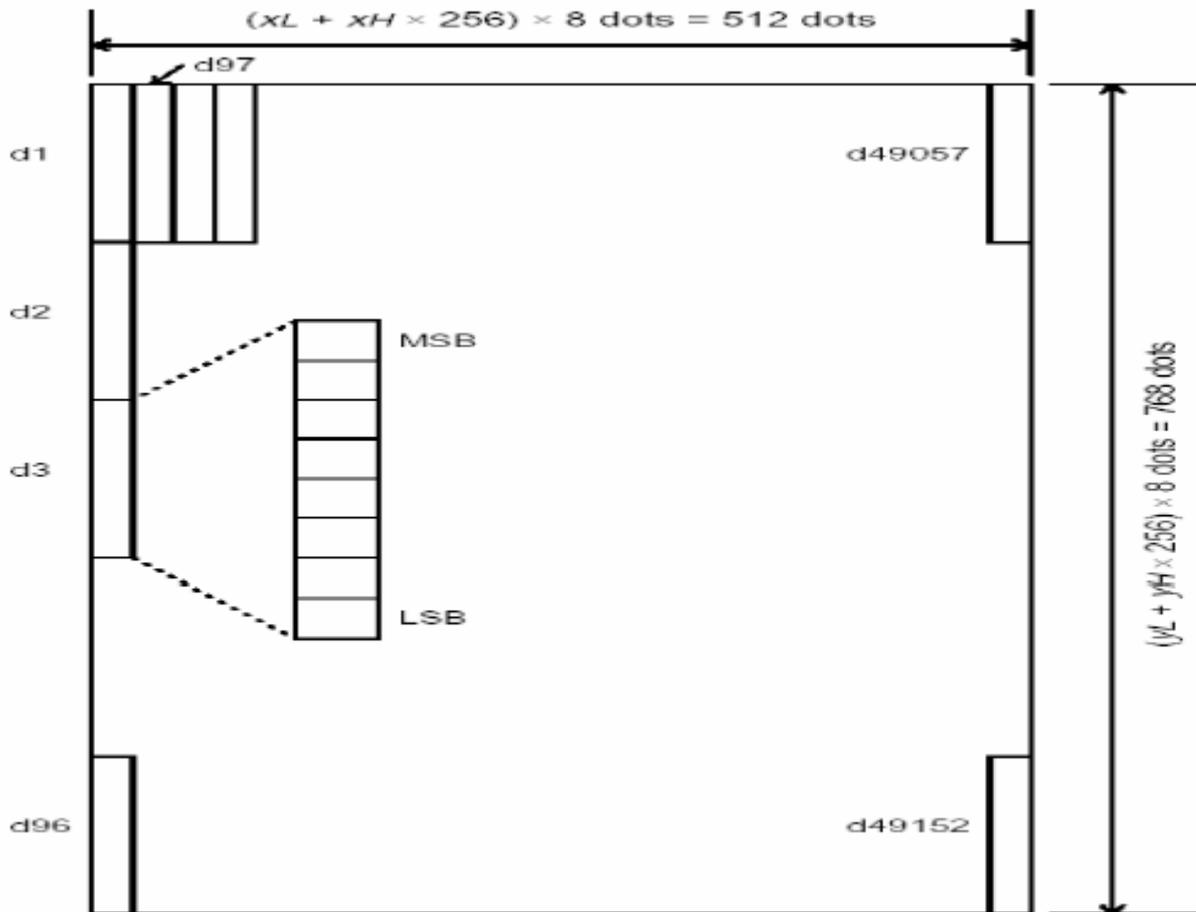
GS ! n--Select print mode(s)

ASCII   GS   !   n

Hex	1DH	21H	n
Decimal	29	33	n
Range	0≤n ≤255		
description	Selects the character height using bits 0 to 2 and selects the character width using bits 4 to 7, as follows:		

Bit	Off/On	Hex	Decimal	Function
0-3	Character height selection. See Table 2.			
4-7	Character width selection. See Table 1.			

Table 1

Character Width Selection		
Hex	Decimal	Width
00	0	1 (normal)
10	16	2
20	32	3
30	48	4
40	64	5
50	80	6
60	96	6
70	112	6

Table 2

Character Height Selection		
Hex	Decimal	Width
00	0	1 (normal)
01	1	2
02	2	3
03	3	4
04	4	5
05	5	6
06	6	6
07	7	6

Note • This command is effective for all characters (alphanumeric and Kanji) except for HRI characters.

• If n is outside of the defined range, this command is ignored.

• In standard mode, the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90° clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.

• In page mode, vertical and horizontal directions are based on the character orientation.

• When characters are enlarged with different sizes on one line, all the characters on the line are aligned at the baseline.

• The ESC ! command can also turn double-width and double-height modes on or off. However, the setting of the last received command is effective.

Default   n=0
Reference   ESC!

GS # n--Specify a number for the bit-image to be downloaded.

ASCII   GS   #   n

Hex	1D	23	n	
Decimal	29	33	n	
Range	1≤n≤8			

description Specifies a number for the bit-image to be downloaded. This number is to be used when printing this bit-image.

Note
- The command is only enabled for bit-images in RAM and the settings are erased when the printer is turned off.
- The number specified by this command does not apply to bit-images downloaded to NV memory.

**GS $ nL nH--Set absolute vertical print position in page mode**

ASCII	GS	$	nL	nH
Hex	1DH	24H	nL	nH
Decimal	29	36	nL	nH
Range	0≤nL≤255,0≤nH≤255			

Description
- Sets the absolute vertical print starting position for buffer character data in page mode.
- This command sets the absolute print position to [(nL + nH × 256) × (vertical or horizontal motion unit)] inches.

Note
- This command is effective only in page mode.
- If the [(nL+ nH × 256) × (vertical or horizontal motion unit)] exceeds the specified printing area, this command is ignored.
- The horizontal starting buffer position does not move.
- The reference starting position is that specified by ESC T.
- This command operates as follows, depending on the starting position of the printing area specified by ESC T:
  ① When the starting position is set to the upper left or lower right, this command sets the absolute position in the vertical direction.
  ② When the starting position is set to the upper right or lower left, this command sets the absolute position in the horizontal direction
- The horizontal and vertical motion units are specified by GS P.

Reference ESC $,ESC T,ESC W,ESC \,GS P,GS \

GS * x y d1...d(x×y×8)-- Define downloaded bit image

ASCII	GS	*	x y d1...d(x×y×8)
Hex	1DH	2AH	x y d1...d(x×y×8)
Decimal	29	42	x y d1...d(x×y×8)
Range	1≤x≤255；1≤y≤48；x×y≤912；0≤d≤255		

description Defines a downloaded bit image using the number of bytes specified by x and y
- x specifies the number of dots in the horizontal direction.
- y specifies the number of dots in the vertical direction.

Note
- The number of dots in the horizontal direction is x × 8, in the vertical direction it is y × 8.
- If x × y is out of the specified range, this command is disabled.
- The d indicates bit-image data. Data (d) specifies a bit printed to 1 and not printed

to 0.

- The downloaded bit image definition is cleared when printer is reset or the power is turned off.
- The following figure shows the relationship between the downloaded bit image and the printed data.
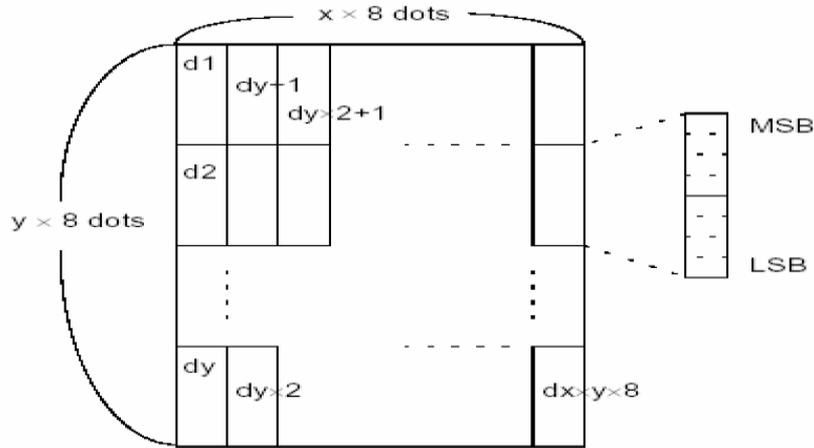
Reference   GS /

GS / m-- Print downloaded bit image

ASCII   GS   /   m
Hex   1DH   2FH   m
Decimal   29   47   m
Range   0≤m≤3,48≤m≤51
description Prints a downloaded bit image using the mode specified by m.

m selects a mode from the table below:

m	模式	Vertical Dot Density (DPI)	Horizontal Dot Density (DPI)
0,48	Normal	200	200
1,49	Double-width	200	100
2,50	Double-height	100	200
3,51	Quadruple	100	100

Note
- This command is ignored if a downloaded bit image has not been defined.
- In standard mode, this command is effective even when there is data in the print buffer.
- This command has no effect in the print modes (emphasized, double-strike, underline, character size, or white/black reverse printing), except for upside-down printing mode.
- If the downloaded bit-image to be printed exceeds the printable area, the excess data is not printed.
- The command prints bit-images in RAM and not that in NV memory. The number for the bit-image to be printed is defined by GS # command.

Reference   GS *,GS #

GS :-- Start/end macro definition

ASCII	GS	:
Hex	1DH	3AH
Decimal	29	58

description   Starts or ends macro definition.

Note
- Macro definition starts when this command is received during normal operation. Macro definition ends when this command is received during macro definition.
- When GS ^ is received during macro definition, the printer ends macro definition and clears the definition.
- Macro is not defined when the power is turned on.
- The defined contents of the macro are not cleared by ESC @. Therefore, ESC @ can be included in the contents of the macro definition.
- If the printer receives GS : again immediately after previously receiving GS : the printer remains in the macro undefined state.
- The contents of the macro can be defined up to 2046 bytes. If the macro definition exceeds 2046 bytes, excess data is not stored.

Reference   GS ^

GS B n--Turn white/black reverse printing mode

ASCII	GS	B	n
Hex	1DH	42H	n
Decimal	29	66	n

Range   0≤n≤255

description   Turns on or off white/black reverse printing mode.
- When the LSB of n is 0, white/black reverse mode is turned off.
- When the LSB of n is 1, white/black reverse mode is turned on.

Note
- Only the LSB of n is valid.
- This command is available for all built-in characters and user-defined characters except HRI characters.
- When white/black reverse printing mode is on, it also applied to character spacing set by ESC SP.
- This command does not affect bit image, user-defined bit image, bar code, HRI characters, and spacing skipped by HT, ESC $, and ESC \.
- This command does not affect the space between lines.
- White/black reverse mode has a higher priority than underline mode. Even if underline mode is on, it is disabled (but not canceled) when white/black reverse mode is selected.

Default   n=0

GS H n-- Select printing position for HRI characters

ASCII	GS	H	n
Hex	1DH	48H	n
Decimal	29	72	n

Range   0≤n≤3,48≤n≤51

description   Selects the printing position of HRI characters when printing a bar code.

n selects the printing position as follows:

N	Printing position
0, 48	Not printed
1, 49	Above the bar code
2, 50	Below the bar code
3, 51	Both above and below the bar code

- HRI indicates Human Readable Interpretation.

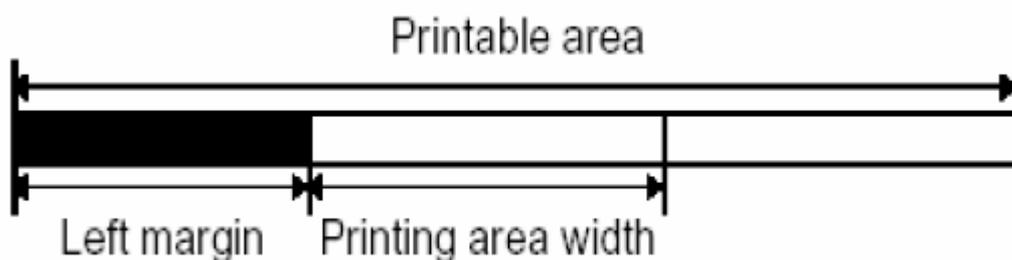Note   • HRI characters are printed using the font specified by GS f.

Default   n=0

Reference   GS f,GS k

GS L nL nH-- Set left margin

ASCII	GS	L	nL	nH
Hex	1D	4C	nL	nH
Decimal	29	76	nL	nH

Range $0 \leqslant nL \leqslant 255$; $0 \leqslant nH \leqslant 255$

Description • Sets the left margin using nL and nH.

- The left margin is set to [(nL + nH × 256) × horizontal motion unit)] inches.

Printable area

Left margin   Printing area width

Note   • This command is effective only processed at the beginning of the line in standard mode.

- If this command is input in page mode, the printer performs only internal flag operations.
- This command does not affect printing in page mode.
- If the setting exceeds the printable area, this command is ignored.
- he horizontal and vertical motion units are specified by GS P. Changing the horizontal and vertical motion unit does not affect the current left margin.

Default   nL=0,nH=0

Reference   GS P,GS W

GS P x y-- Set horizontal and vertical motion units

ASCII	GS	P	x	y
Hex	1D	50	x	y
Decimal	29	80	x	y

Range $0 \leqslant x \leqslant 255$; $0 \leqslant y \leqslant 255$

Description • Sets the horizontal and vertical motion units to approximately 25.4/ x mm {1/ x inches} and approximately 25.4/ y mm {1/ y inches} respectively.

Note
- When x and y are set to 0, the default setting of each value is used.
- The horizontal direction is perpendicular to the paper feed direction and the vertical direction is the paper feed direction.
- In standard mode, the following commands use x or y, regardless of character rotation (upside-down or 90° clockwise rotation):
  ①Commands using x: ESC SP, ESC $, ESC \, FS S, GS L, GS W
  ②Commands using y: ESC 3, ESC J, GS V
- In page mode, the following command use x or y, depending on character orientation:
  ①When the print starting position is set to the upper left or lower right of the printing area using ESC T (data is buffered in the direction perpendicular to the paper feed direction):
  Commands using x: ESC SP, ESC $, ESC W, ESC \, FS S
  Commands using y: ESC 3, ESC J, ESC W, GS $, GS \, GS V
  ②When the print starting position is set to the upper right or lower left of the printing area using ESC T (data is buffered in the paper feed direction):
  Commands using x: ESC 3, ESC J, ESC W, GS $, GS \
  Commands using y: ESC SP, ESC $, ESC W, ESC \,FS S, GS V.
- The command does not affect the previously specified values.
- The minimum motion unit is a combined result of this command and other commands.

Default   x=200,y=200
Reference   ESC SP,ESC $,ESC 3,ESC J,ESC W,ESC \,GS $,GS L,GS V,GS W,GS \

①GS V m②GS V m n-- Select cut mode and cut paper

① ASCII   GS   V   m
  Hex   1DH   56H   m
  Decimal   29   86   m
② ASCII   GS   V   m   n
  Hex   1DH   56H   m   n
  Decimal   29   86   m   n

Range   ①m=0，48，1，49
         ②m=66，0≤n≤255

description   Selects a mode for cutting paper and executes paper cutting.
         The value of m selects the mode as follows:

| M	Print mode
0，48	Full cut
1，49	Half cut
66	Feeds paper (n × vertical motion unit) inches and cuts the paper half.

[Notes for ①and②]   · This command is effective only processed at the beginning of a line.

[Note for ②]   · The printer execute to cut paper directly when n= 0, 1, 48, 49
         · When m=66, the printer feeds paper (n × vertical motion unit) first and cuts paper.
         · The horizontal and vertical motion units are specified by GS P.

• The vertical motion unit (y) is used for calculating the paper feed length.

GS W nL nH-- Set printing area width

ASCII	GS	W	nL	nH	
Hex	1DH	57H	nL	nH	
Decimal	29	87	nL	nH	

Range   0≤nL≤255；0≤nH≤255

description   Sets the printing area width to the area specified by nL and nH.

• The printing area width is set to [(nL + nH × 256) × horizontal motion unit)] inches.

Printable area
Left margin   Printing area width
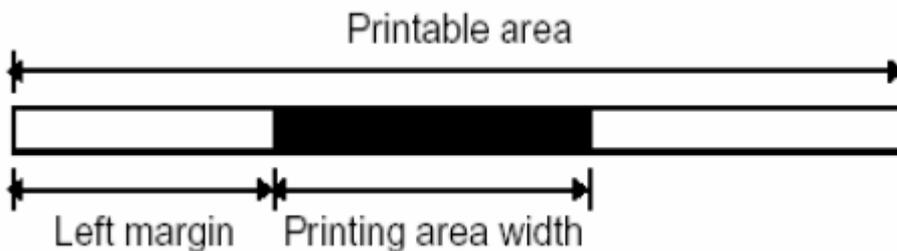
Note   • This command is effective only processed at the beginning of the line.
• In page mode, the printer performs only internal flag operations.
• This command does not affect printing in page mode.
•If the [left margin + printing area width] exceeds the printable area, [printable area width - left margin) is used.
• The horizontal and vertical motion units are specified by GS P. Changing the horizontal and vertical motion units does not affect the current left margin and print area width.
• The horizontal motion unit (x) is used for calculating the printing area width.

Default   nL=76,nH=2

Reference   GS L,GS P

GS \ nL nH-- Set relative vertical print position in page mode

ASCII	GS	\	nL	nH
Hex	1DH	5CH	nL	nH
Decimal	29	92	nL	nH

Range   0≤nL≤255；0≤nH≤255

description   Sets the relative vertical print starting position from the current position in page mode.

• This command sets the distance from the current position to [(nL + nH × 256) × vertical or horizontal motion unit] inches.

Note   • This command is ignored unless page mode is selected.
• When pitch N is specified to the movement downward: nL + nH × 256 = N
When pitch N is specified to the movement upward (the negative direction), use the complement of 65536. nL + nH × 256 = 65536 - N
• Any setting that exceeds the specified printing area is ignored.

- This command function as follows, depending on the print starting position set by ESC T:
  ① When the starting position is set to the upper left or lower right of the printing, the vertical motion unit (y) is used.
  ② When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit (x) is used.
- The horizontal and vertical motion units are specified by GS P.

Reference   ESC $,ESC T,ESC W,ESC \,GS $,GS P

GS ^ r t m-- Execute macro

ASCII	GS	^	r	t	m
Hex	1D	5E	r	t	m
Decimal	29	94	r	t	m

Range $0 \leqslant r \leqslant 255$；$0 \leqslant t \leqslant 255$；m=0,1

description   Executes a macro.
- r specifies the number of times to execute the macro.
- t specifies the waiting time for executing the macro.
- m specifies macro executing mode.
  When the LSB of m = 0: The macro executes r times continuously at the interval specified by t (t x 250ms).
  When the LSB of m = 1: After waiting for the period specified by t, the PAPER OUT LED indicators blink and the printer waits for the FEED button to be pressed. After the button is pressed, the printer executes the macro once. The printer repeats the operation r times.

Note
- The waiting time is $t \times 100$ ms for every macro execution.
- If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.
- If the macro is not defined or if r is 0, nothing is executed.
- When the macro is executed (m = 1), paper always cannot be fed by using the FEED button.

Reference   GS:

GS f n-- Select font for Human Readable Interpretation (HRI) characters

ASCII	GS	f	n
Hex	1DH	66H	n
Decimal	29	102	n

Range   n=0,1,48,49

description   Selects a font for the HRI characters used when printing a bar code.

n selects a font from the following table:

n	Font
0,48	Standard ASCII characters (12×24)
1,49	Compressed ASCII characters (9×17)

Note
- HRI indicates Human Readable Interpretation.
- HRI characters are printed at the position specified by GS H.

Default   n=0

Reference   GS H,GS k

GS h n-- Select bar code height

ASCII	GS	h	n
Hex	1DH	68H	n
Decimal	29	104	n

Range $1 \leqslant n \leqslant 255$

description   Selects the height of the bar code. n specifies the number of dots in the vertical direction.

Default   n=162

Reference   GS k

①GS k m d1...dk NUL②GS k m n d1...dn-- Print barcode

①ASCII	GS	k	m	d1...dk	NUL
Hex	1DH	6BH	m	d1...dk	00
Decimal	29	107	m	d1...dk	0
②ASCII	GS	k	m	n	d1...dn
Hex	1DH	6BH	m	n	d1...dn
Decimal	29	107 m	n	d1...dn	

Range   ①$0 \leqslant m \leqslant 6$（k and d depends on the bar code system used）

           ②$65 \leqslant m \leqslant 73$（n and d depends on the bar code system used）

description   Selects a bar code system and prints the bar code.

           m selects a bar code system as follows:

	m	Bar Code System	Number of	Remarks
①	0	UPC-A	$11 \leq k \leq 12$	$48 \leq d \leq 57$
	1	UPC-E	$1 \leq k \leq 12$	$48 \leq d \leq 57$
	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	$1 \leq n \leq 12$	$48 \leq d \leq 57$
	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	$2 \leq n \leq 255$	$0 \leq d \leq 127$

Note① • This command ends with a NULL code.
   • When UPC-A or UPC-E barcode system is selected, if more than 12 bytes barcode data is received, the printer will process the excess data as normal data.
   • When JAN13 (EAN13) barcode system is selected, if more than 13 barcodes data is received, the printer will process the excess data as normal data.
   • When JAN8 (EAN8) barcode system is selected, if more than 8 bytes barcodes data is received, the printer will process the excess data as normal data.
   • The number of data for ITF bar code must be even numbers. When an odd number of data is input, the printer ignores the last received data.

Note② • n indicates the number of bar code data, and the printer processes n bytes from the next character data as bar code data.
   • If n is outside of the specified range, the printer stops command processing and processes the following data as normal data.

Note in standard mode:
   • If d is outside of the specified range, the printer only feeds paper and processes the following data as normal data.
   • If the horizontal size exceeds printing area, the command is ignored.
   • This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by ESC 2 or ESC 3.
   • This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following m as normal data.
   • After printing bar code, this command sets the print position to the beginning of the line.
   • This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated character, etc.), except for upside-down printing   mode.

Note in page mode:
   • This command develops bar code data in the print buffer, but does not print it. After processing bar code data, this command moves the print position to the right side dot of the bar code.
   • If d is out of the specified range, the printer stops command processing and processes the following data as normal data. In this case the data buffer position does not change.
   • If bar code width exceeds the printing area, the printer does not print the barcode

When using the CODE 128 in this printer, take the following points into account for data transmission:
   ① The top of the bar code data string must be code set selection character (any of CODE A,   CODE B or CODE C) which selects
   ② Special characters are defined by combining two characters "{" and one character. The ASCII character "{" is defined by transmitting "{" twice consecutively.

Specific   **Transmit 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：　Example data for printing "No. 123456" In this example, the printer first prints "No." using CODE B, then prints the following numbers using CODE C. GS k 73 10 123 66 78 111 46 123 67 12 34 56

No.123456

- If the top of the bar code data is not the code set selection character, the printer stops command processing and ignore the following data.
- If combination of "{" and the following character does not apply any special character, the printer stops command processing and ignore the following data.
- If the printer receives characters that cannot be used in the special code set, the printer stops command processing and ignore the following data.
- The printer does not print HRI characters that correspond to the shift characters or code set selection characters.
- HRI character for the function character is space.
- HRI characters for the control character (<00>H to <1F>H and <7F>H) are not printed.

Others　　　Be sure to keep spaces on both right and left sides of a bar code. (Spaces are different depending on the types of the bar code.)

Reference　　GS H,GS f,GS h,GS w.

GS r n　Transmit status

ASCII	GS	r	n
Hex	1DH	72H	n
Decimal	29	114	n

Range　　　n=1,2,49,50

description　Transmits the status specified by n as follows:

n	**Function**
1，49	Transmits paper sensor status
2，50	Transmits cash drawer status

Note
- This command is valid for serial model only.
- This command is executed when the data in the receive buffer is developed. Therefore, there may be a time lag between receiving this command and transmitting the status, depending on the receive buffer status.
- The status types to be transmitted are shown below:

Paper sensor status (n = 1, 49):

Bit	0/1	Hex	Decimal	Status
0，1	0	00	0	Paper near-end sensor: paper
	1	03	3	Paper near-end sensor: paper near
2，3	0	00	0	Paper end sensor: paper adequate
	1	0c	12	Paper end sensor: paper end
4	0	00	0	Not used. Fixed to Off
5，6				Undefined
7	0f	00	0	Not used. Fixed to Off

Cash drawer status (n=2,50)：

Bit	0/1	Hex	Decimal	Status
0	0	00	0	Cash drawer opened
	1	01	1	Cash drawer close
1- 3				Undefined
4	0	00	0	Not used. Fixed to Off
5，6				Undefined
7	0	00	0	Not used. Fixed to Off

Reference	DLE EOT,GS a

GS v 0 m xL xH yL yH d1....dk-- Print raster bit image

ASCII	GS	v	0	m xL xH yL yH d1...dk
Hex	1D	76	30	m xL xH yL yH d1...dk
Decimal	29	118	48	m xL xH yL yH d1...dk

Range $0 \leqslant m \leqslant 3; 48 \leqslant m \leqslant 51; 0 \leqslant xL \leqslant 255; 0 \leqslant xH \leqslant 255; 0 \leqslant yL \leqslant 255; 0 \leqslant d \leqslant 255; k=(xL+xH \times 256) \times (yL+yH \times 256)(k \neq 0)$

description   Selects raster bit-image mode.   The value of m selects the mode as follows :

m	Mode	Vertical dot density	Horizontal dot density
0, 48	Normal	200 DPI	200 DPI
1, 49	Double-width	200 DPI	100 DPI
2, 50	Double-height	100 DPI	200 DPI
3, 51	Quadruple	100 DPI	100 DPI

- xL, xH, selects the number of data bits (xL+xH×256)in the horizontal direction for the bit image.

- yL, yH, selects the number of data bits (yL+yH×256)in the vertical direction for the bit image.

Note   • In standard mode, this command is effective only when there is no data in the print buffer.

- This command has no effect in all print modes (character size, emphasized, double-strike, upside-down, underline, white/black reverse printing, etc.) for raster bit image.
- Any setting that exceeds the specified printing area is ignored.
- The ESC a (Select justification) setting is also effective on raster bit images.
- When this command is received during macro definition, the printer ends macro

definition, and begins performing this command. The definition of this command should be cleared.

- d indicates the bit-image data. Set time a bit to 1 prints a dot and setting it to 0 does not print a dot.

[Example]   When xL + xH x 256 = 64
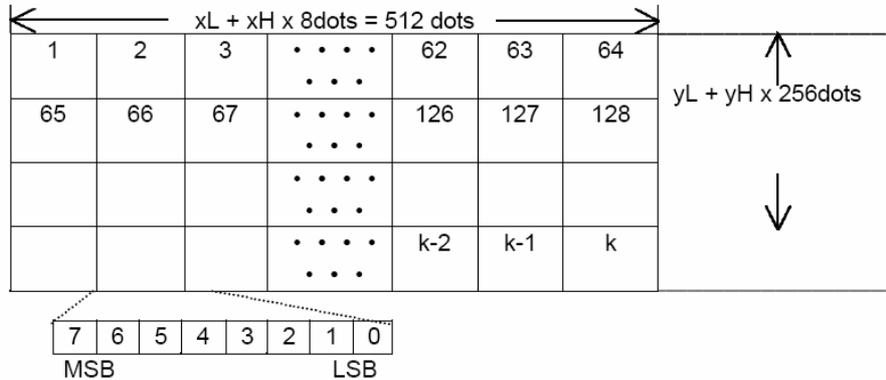
GS w n-- Set bar code width.

ASCII	GS	w	n
Hex	1D	77	n
Decimal	29	119	n

Range   2≤n≤6

description   Set the horizontal size of the bar code.

n specified the bar code width as follows:

N	Module width for multi-level bar code	Binary-level bar code	
		Thin element width (mm)	Thick element width (mm)
2	0.25	0.25	0.625
3	0.375	0.375	1.0
4	0.5	0.5	1.25
5	0.625	0.625	1.625
6	0.75	0.75	1.875

- Multi-level bar codes are as follows:
  UPC-A, UPC-E, JAN13(EAN13), JAN8(EAN8), CODE93, CODE128.
- Binary-level bar codes are as follows:
  CODE39, ITF, CODABAR

Default   n=2

Reference   GS k

ESC t n—Choose the extant font code

ASCII	ESC	t	n
Hex	1BH	74H	n
Decimal	27	116	n

Range   0≤n≤255

n specified the font code as follows:

n	扩展字库名称	
0	PC437:Standard-Europe	Standard-Europe
1	Katakana	Katakana
2	PC850:Multilingual	
3	PC860:Portuguese	Portuguese
4	PC863:Canadian-French	Canadian-French
5	PC865:Nordic	Nordic
6	West-Europe	West-Europe
7	Greek	Greek
8	Hebrew	Hebrew
9	East-Eruope	East-Eruope
10	Iran	Iran
16	WPC1252	
17	PC866:Cyrillic#2	Cyrillic-2
18	PC852:Latin2	Latin-2
19	PC858	

description   Choose the font which you want to print out by n

Note

Default   n=0

Reference