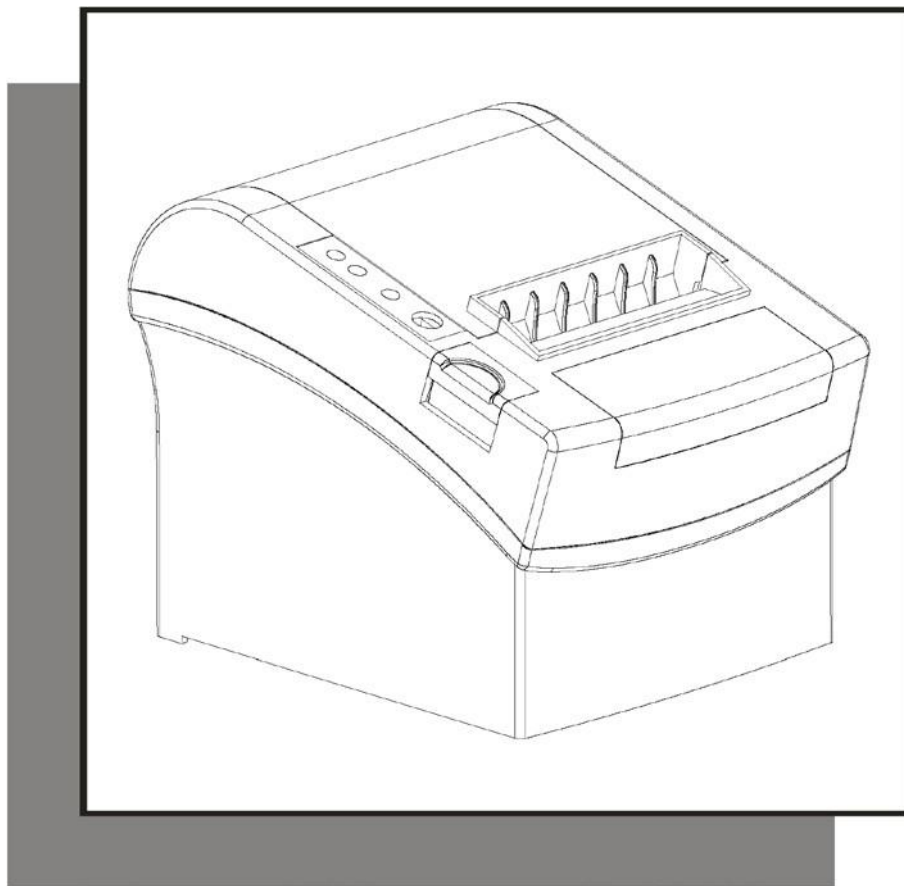


# **Programming Manual for the Thermal Printer**

## **POS-80X Series**



## Format Description

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This manual is applicable to the products of POS-80XX series of 80mm series thermal bill printer which is produced by the company. Command instructions for this programming manual include the following sections:

- 1) Command name and function overview. This is the first part of the command description. The command in ASCII code and the function of the command are given.
- 2) Format. This part uses ASCII code form, the hexadecimal code form and decimal code 3 forms to describe the command.
- Unless it is specified, the value range is a decimal number. For example,  $1 \leq n \leq 4$  in the following example, where 1 is the 1 of the decimal number, rather than "1" in the ASCII code coding table.
- 3) Scope. The range of variables is given.
- 4) Description. A detailed explanation of the command is given.
- 5) Notes. Notes for the command are given. The details are given in this section because commands in different modes and in conjunction with different commands can cause mutual interaction.
- 6) Reference. Other commands which are related to and similar to this command are given.
- 7) Some commands are only supported by some models, such as page mode (supports models: C300H, D300N, R330HT890, T891S300L, A300L, E300N, H300L, etc.)

```
--->    DLE EOT n Real-time status transfer
--->    [Format]          ASCII code          DLE      EOT      n
                        Hexadecimal code      10       04      n
                        Decimal code          16       4       n
--->    [Range]           $1 \leq n \leq 4$ 
--->    [Description]    The printer status which is specified by parameter n is transmitted in real time:
                        .....
--->    [Note]          The printer returns the relevant status as soon as it receives the command
                        .....
--->    [Reference]
```

### 1. HT horizontal positioning

---

[Format]	ASCII code	HT
	Hexadecimal code	09
	Decimal code	9

[Description] Move the print position to the position of the next horizontal positioning.

- [Note]
- If the position of the next horizontal positioning is not set, the command will be ignored.
  - If the position of the next horizontal positioning is outside the print area, the print position will be moved to the area [Print area width+1].
  - The position of the horizontal positioning is set by the ESC D command.

- When the command is received when the print position is at [Print area width+1], the printer executes the print buffer to print the current line full, and processes the horizontal positioning at the beginning of the next line.

- The default horizontal positioning position is also one spacing for every 8 standard ASCII characters (12×24)(i. e., 9, 17, 25, ... columns).

- When the current line buffer is full, the printer performs the following actions: In standard mode, the printer prints the contents of the current line and places the print position at the start position of the next line. In the page mode, the printer wraps lines and places the print position at the start position of the next line.

[Reference] **ESC D**

## 2. LF printing and line feed

---

[Format]      ASCII code          LF  
                   Hexadecimal code      0A  
                   Decimal code            10

[Description] The data in the print buffer is printed and the printing paper is moved forward one line at the current line spacing.

[Note]            This command sets the print position to the start position of the line.

[Reference] **ESC 2, ESC 3**

## 3. FF prints and returns to the standard mode (in page mode)

---

[Format]      ASCII code          FF  
                   Hexadecimal code      0C  
                   Decimal code            12

[Description] Prints all the data in the print buffer in page mode and returns to standard mode.

[Note]            •After printing, clear the data in the buffer.  
                   •The print area which is set by ESC W is reset to the default setting.  
                   •The printer does not perform a paper cut action.  
                   •This command sets the print position as the starting point of the line.  
                   •This command is only valid in the page mode.

[Reference] **ESC FF, ESC L, ESC S**

## 4. Cancel the printing data in the CAN page mode

---

[Format]      ASCII code          CAN  
                   Hexadecimal code      18  
                   Decimal code            24

[Description] In page mode, delete all the printing data in the current print area.

[Note]            •This command is only valid in page mode.  
                   •If there is an overlap between the previously set area and the current area, the overlap will also be also deleted.

[Reference] **ESC L, ESC W**

## 5. DLE EOT n Real-time status transfer

[Format]	ASCII code	DLE	EOT	n
	Hexadecimal code	10	04	n
	Decimal code	16	4	n
[Range]	$1 \leq n \leq 4$			
[Description]	<p>The printer status is transmitted in real time in line with the following parameters, and the parameter n is used to specify the printer status to be transferred:</p> <p>n=1: Transfer printer status  n=2: Transfer offline status  n=3: Transfer error status  n=4: Transfer paper sensor status</p>			
[Note]	<ul style="list-style-type: none"> <li>•The printer returns the relevant status as soon as it receives the command</li> <li>•Try not to insert this command in a 2-byte or other more command sequence.</li> <li>•This command is valid even if the printer is prohibited by the <b>ESC</b> = (Select the peripheral setting) command.</li> <li>•The printer transmits the current state, each represented by 1-byte of data.</li> <li>•The printer transfer status does not confirm that the host has received it.</li> <li>•The printer executes as soon as it receives the command.</li> <li>•This command is only valid for serial printers. The printer executes the command as soon as it is received in any state.</li> </ul> <p>n=1: Printer status</p>			

Bit	0/1	Hexadecimal code	Decimal code	Function
0	0	00	0	Be fixed to 0
1	1	02	2	Be fixed to 1
2	0	00	0	One or two cash drawer open
	1	04	4	Both cash drawer are closed
3	0	00	0	Online
	1	08	8	Offline
4	1	10	16	Be fixed to 1
5, 6		---	---	Undefined
7	0	00	00	Be fixed to 0

### n=2: Offline status

Bit	0/1	Hexadecimal code	Decimal code	Function
0	0	00	0	Be fixed to 0
1	1	02	2	Be fixed to 1
2	0	00	0	Upper cover is closed
	1	04	4	Upper cover is open
3	0	00	0	The paper feed key is not pressed
	1	08	8	The paper feed key is pressed
4	1	10	16	Be fixed to 1
5	0	00	0	Printer is not running out of paper
	1	20	32	Printer is running out of paper

6	0	00	0	No errors
	1	40	64	Error condition
7	0	00	0	Be fixed to 0

n=3: Error status

Bit	0/1	Hexadecimal code	Decimal code	Function
0	0	00	0	Be fixed to 0
1	1	02	2	Be fixed to 1
2		---	---	Undefined
3	0	00	0	There is no error in the cutter.
	1	08	8	There is an error in the cutter
4	1	10	16	Be fixed to 1
5	0	00	0	There are no unrecoverable errors
	1	20	32	There are unrecoverable errors
6	0	00	0	Print-head temperature and voltage are normal
	1	40	64	Print-head temperature or voltage is out of range
7	0	00	0	Be fixed to 0

n=4: Transfer status

Bit	1/0	Hexadecimal code	Decimal code	Function
0	0	00	0	Be fixed to 0
1	1	02	2	Be fixed to 1
2, 3	0	00	0	There are some papers
	1	0C	12	The paper will be running out
4	1	10	16	Be fixed to 1
5, 6	0	00	0	There are some papers
	1	60	96	The papers are used up.
7	0	00	0	Be fixed to 0

[Reference] **DLE ENQ, GS a, GS r**

## 6. DLEENQn Real-time request to printer

[Format]	ASCII code	DLE	ENQ	n
	Hexadecimal code	10	05	n
	Decimal code	16	5	n
[Range]	1 ≤ n ≤ 2			
[Description]	The printer responds to a host request. N will specify the following request			
	n	Request content		
	1	Recover from the error state and resume interrupted printing		
	2	Restore from error state in the clear command receive the buffer and print buffer		

- [Note]
- This command is only valid in the event of a cutter error.
  - In serial port mode, the printer executes the command as soon as it receives it.
  - In the parallel mode, this command is not executed when the printer is busy.
  - Try not to insert this command in a 2-byte or other more command sequence.

- This command is valid even if the printer is prohibited by the **ESC=** (Select the peripheral setting) command.

[Reference] **DLE EOT**

#### 7. DLE DC4 n m t real-time generation of cash drawer opening pulse

[Format]	ASCII code	DLE	DC4	n	m	t
	Hexadecimal code	10	14	n	m	t
[Range]	Decimal code	16	20	n	m	t
	n = 1					
	m = 0, 1					
	1 ≤ t ≤ 8					
[Description]	The set start pulse is generated at the designated pin of cash box socket. The pin is designated by m:					

m	Connecting pin
0	Cash drawer socket pin 2
1	Cash drawer socket pin 5

The pulse high time is [t×100 ms] and the low time is [t×100 ms] .

- [Note]
- This command is ignored when the printer is executing a cash drawer open command (**ESC p** or **DEL DC4**).
  - In serial port mode, the printer executes the command as soon as it receives it.
  - In the parallel mode, this command is not executed when the printer is busy.
  - If the print data contains the same data as this command, the data will be executed as if it were the command. The user must take this situation into consideration.
  - Try not to insert this command in a 2-byte or other more command sequence.
  - This command is valid even if the printer is prohibited by the **ESC=**(Select the peripheral setting) command.

[Reference] **ESC p**

#### 8. Printing in the ESC FF page mode

[Format]	ASCII code	ESC	FF
	Hexadecimal code	1B	0C
	Decimal code	27	12
[Description]	In page mode, all the contents of the buffer are printed.		
[Note]	<ul style="list-style-type: none"> <li>•This command is only valid in page mode.</li> <li>•The contents of the print buffer, <b>ESC T</b> and <b>ESC W</b> settings, and the positions of characters will not be cleared after printing.</li> </ul>		

[Reference] **FF, ESC L, ESC S**

#### 9. ESC SP n setting character spacing right

[Format]	ASCII code	ESC	SP	n
	Hexadecimal code	1B	20	n
	Decimal code	27	32	n
[Range]	0 ≤ n ≤ 255			
[Description]	Sets the right spacing of characters to [n×lateral or longitudinal moving units] inches.			
[Note]	<ul style="list-style-type: none"> <li>•When the character is enlarged, the right spacing is enlarged by the same multiple.</li> <li>•The values set by this command are independent of each other in page mode and standard mode.</li> </ul>			

- The lateral or longitudinal movement units is designated by **GS P**. Changing the lateral or longitudinal movement unit will not change the current right spacing.
- The **GS P** command changes the horizontal (and perpendicular) units of motion. However, the value must not be less than the minimum horizontal movement and must be an even unit of the minimum horizontal movement.
- In standard mode, use lateral movement units.
- In page mode, you can choose to use the lateral or longitudinal movement units, depending on the direction and start position of the region, as follows:
  1. When the printing start position is set to the position of upper left corner or the lower right corner of the printing area by **ESC T**, the lateral movement unit is used;
  2. When the printing start position is set to the position of lower left corner or the upper right corner of the printing area by **ESC T**, the longitudinal movement unit is used;
- The maximum right spacing is 31.91 mm (255/203 inches). Any setting that exceeds this value is automatically changed to the maximum right spacing.

[Default]      n = 0

[Reference]    **GS P**

#### 10. ESC! N Select the printing mode

[Format]	ASCII code	ESC	!	n
	Hexadecimal code	1B	21	n
	Decimal code	27	33	n
[Range]	0 ≤ n ≤ 255			
[Description]	Set the character print mode in line with the value of n			

Bit	1/0	Hexadecimal code	Decimal code	Function
0	0	00	0	Standard ASCII typeface A (12×24)
	1	01	1	Compressed ASCII typeface B (9×17)
1, 2		---	---	Undefined
3	0	00	0	Cancel Bold Mode
	1	08	8	Select bold mode
4	0	00	0	Cancel double height mode
	1	10	16	Select double height mode
5	0	00	0	Cancel double width mode
	1	20	32	Select double width mode
6		---	---	Undefined
7	0	00	0	Cancel underline mode
	1	80	128	Select underline mode

- [Note]
- When Double width and Double height modes are selected at the same time, the characters are magnified twice in both the lateral and longitudinal.
  - Any character other than the **HT** space and the characters rotated 90°clockwise can be underlined.
  - The degree of underlining is determined by **ESC-**, regardless of the character.
  - When some characters in a line are multiples or higher, all characters are aligned at the bottom.
  - ESC E** can also select or cancel the bold mode, and the last executed command is valid.
  - ESC –** Can also select or cancel the underline mode, and the last command executed is valid.
  - GS!** The character size can also be set so that the last executed command is valid.

•Bold mode is valid for both the English characters and the Chinese characters. All print modes except bold mode are valid only for alphanumeric characters.

[Default] n = 0

[Reference] **ESC ~, ESC E, GS !**

#### 11. **ESC \$nL nH** Sets the absolute printing position

[Format]	ASCII code	ESC	\$	nL	nH
	Hexadecimal code	1B	24	nL	nH
	Decimal code	27	36	nL	nH
[Range]	0 ≤ nL ≤ 255				
	0 ≤ nH ≤ 255				
[Description]	Set the current position to the distance from the beginning of the line (nL+nH×256)×(lateral or longitudinal movement units).				
[Note]	•If the set position is outside the specified print area, the command will be ignored.				
	•The lateral and longitudinal movement units are set by <b>GS P</b> .				
	•Use lateral movement units. In the standard mode				
	•In the page mode, choose to use the lateral or longitudinal movement units based on the direction of the print area and the printing start position, which are as follows:				
	1. When the printing start position is set to the position of upper left corner or the lower right corner of the printing area by <b>ESC T</b> , the lateral movement unit is used; 2. When the printing start position is set to the position of lower left corner or the upper right corner of the printing area by <b>ESC T</b> , the longitudinal movement unit is used;				
[Reference]	<b>ESC \, GS \$, GS \, GS P</b>				

#### 12. **ESC %n** Select/cancel user self-defined characters

[Format]	ASCII code	ESC	%	n
	Hexadecimal code	1B	25	n
	Decimal code	27	37	n
[Range]	0 ≤ n ≤ 255			
[Description]	Select or cancel user self-defined characters.			
	•When the least significant bit of n is 0, the user-defined character will not be used.			
	•When the least significant bit of n is 1, the user-defined character will be used.			
[Note]	•The internal font library is automatically used when user-defined characters are removed.			
	•n Only the least significant bit is valid.			
[Default]	n = 0			
[Reference]	<b>ESC &amp;, ESC ?</b>			

#### 13. **ESC &yc1c2 [x1d1...d(y×x1)] ... [xkd1...d(y×xk)]** Define the user-defined characters

[Format]	ASCII code	ESC	&	y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]
	Hexadecimal code	1B	26	y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]
	Decimal code	27	38	y c1 c2 [x1 d1...d(y × x1)]...[xk d1...d(y × xk)]
[Range]	y = 3			
	32 ≤ c1 ≤ c2 ≤ 127			
	0 ≤ x ≤ 12 Standard ASCII typeface A (12×24)			
	0 ≤ x ≤ 9 Compressed ASCII typeface B (9×17)			
	0 ≤ d1 ... d(y × xk) ≤ 255			
[Description]	Define the user-defined characters			



- y specifies the number of longitudinal bytes.
- c1 is the start character code and c2 is the end character code.
- x Specifies the number of the lateral points.
- The allowed range of character code is <20>H to <7F>H (96 characters) for ASCII codes.
- Multiple characters can be defined consecutively if only one character c1=c2 is defined.
- d is the data of the download character. The data for each point starts from the left.
- The size of the custom character is (y×x) bytes.
- 1 in each bit of the data indicates that the point should be printed, and the 0 indicates no printing.
- User-defined characters are cleared when:
  1. **ESC@** is executed.
  2. **ESC ?** is executed.
  3. **FS q** is executed.
  4. **GS \*** is executed.
  5. The printer is reset or the power is turned off.
- When a user-defined character is defined in font **B (9×17)**, only the most significant bit of the third byte of data in the perpendicular direction is valid.

[Default]

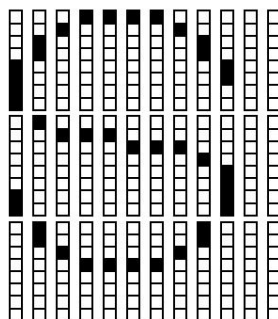
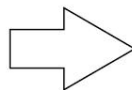
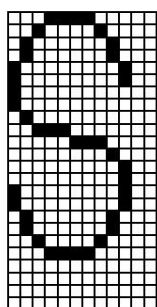
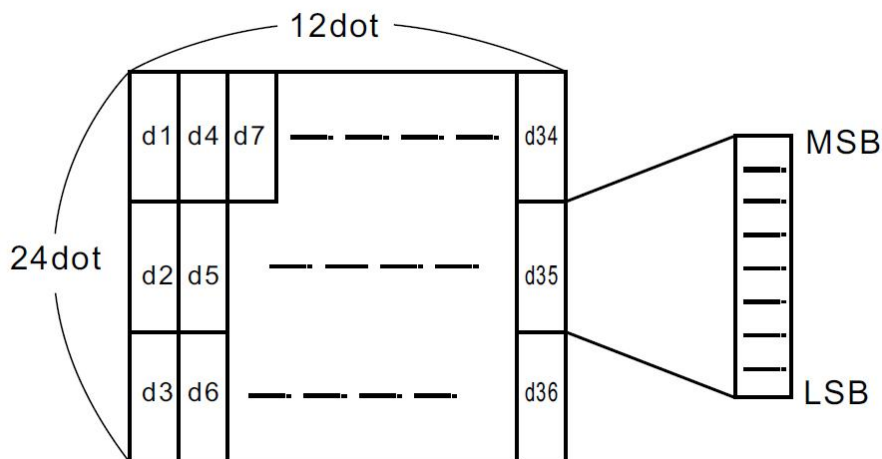
Internal typeface library settings

[Reference]

**ESC %**, **ESC ?**

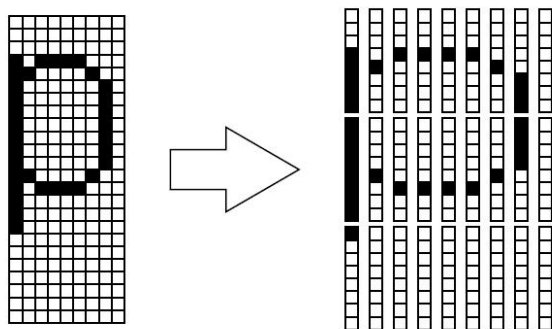
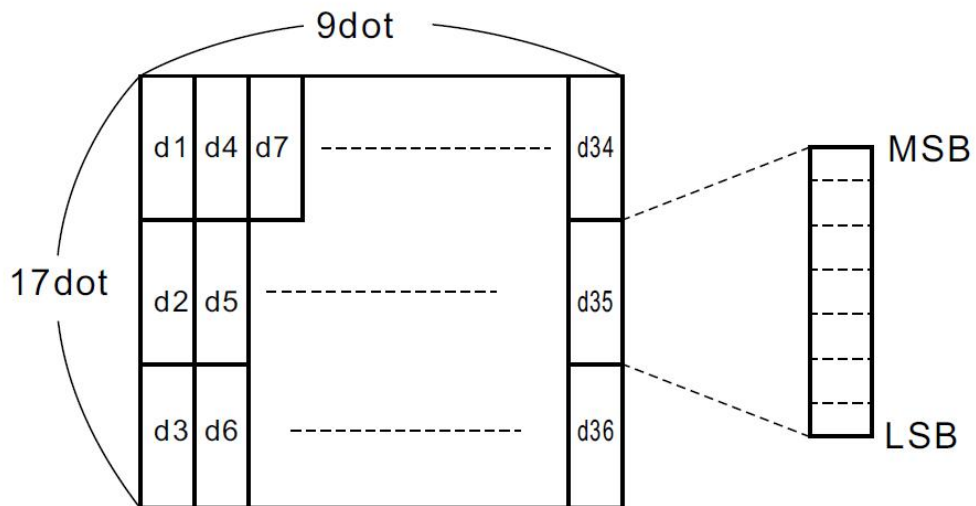
[Instances]

- When a standard ASCII typeface (12×24) is selected



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

- When a compressed ASCII typeface is selected (9×17)



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

#### 14. ESC\*mnLnHd1... dk Select the bitmap mode

[Format]	ASCII code	ESC	*	m nL nH d1...dk
	Hexadecimal code	1B	2A	m nL nH d1...dk
	Decimal code	27	42	m nL nH d1...dk
[Range]	m = 0, 1, 32, 33			
	$0 \leq nL \leq 255$			
	$0 \leq nH \leq 3$			
	$0 \leq d \leq 255$			

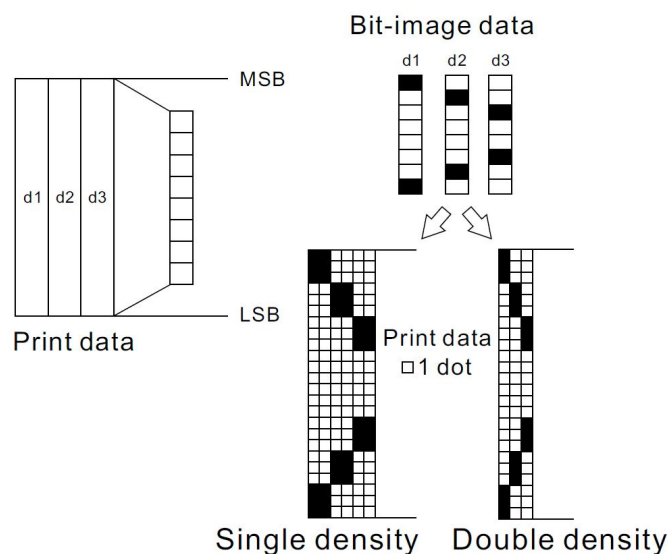
[Description] Select a bitmap mode specified by m, the number of bitmap points are being determined by nL and nH:

m	Mode	Longitudinal		Lateral	
		Number of points	Resolution ration	Resolution ration	Number of data (k)
0	8 points single density	8	67 DPI	100 DPI	$nL + nH \times 256$
1	8 points double density	8	67 DPI	200 DPI	$nL + nH \times 256$
32	24 points single density	24	200 DPI	100 DPI	$(nL + nH \times 256) \times 3$
33	24 points double density	24	200 DPI	200 DPI	$(nL + nH \times 256) \times 3$

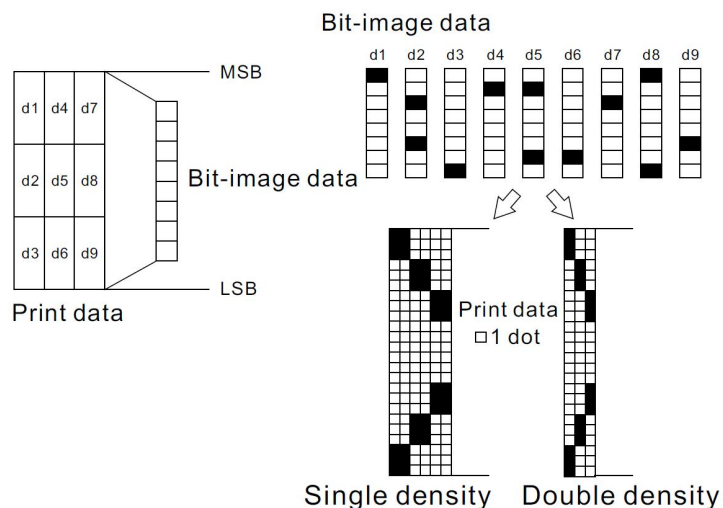
[dpi: point /25.4mm{1"}]

- [Note]
- If the value of m is beyond the specified range, nL and subsequent data are processed as normal data.
  - The number of lateral print points is determined by nL and nH, and the total number of points is  $nL+nH \times 256$ .
  - The bitmap is truncated beyond the current region.
  - D is the data of the bitmap. If each bit of the data is 1, the point will be printed. If it is 0, it will not be printed.
  - After the bitmap data is sent, the printer returns to the normal data processing mode.
  - This command is not affected by other print modes (bold, double, underline, character enlargement, and inversion) except in the inverted mode.
  - If the width of the print range set with **GS L** and **GS W** is smaller than the width which is required for the data sent with the **ESC\***command, do the following for the row in question (but print cannot exceed the maximum printable range):
    1. The width of the print area is expanded to the right to accommodate the amount of data.
    2. If step 1 does not provide enough width for the data, the left edge is reduced to accommodate the data.
  - The relationship between the data and the point to be printed is as follows:

When 8 points density is selected:



When 24 points density is selected:



### 15. ESC – n Select/Cancel underline mode

[Format]	ASCII code	ESC	-	n
	Hexadecimal code	1B	2D	n
	Decimal code	27	45	n
[Range]	$0 \leq n \leq 2, 48 \leq n \leq 50$			
[Description]	Underline mode is selected or canceled according to the value of n:			

n	Function
0, 48	Cancel underline mode
1, 49	Underline mode is selected (1 point of width)
2, 50	Underline mode is selected (2 points of width)

- [Note]
- Underlines can be placed under all characters (including spacing to the right), but do not include spacing set by **HT**.
  - Underlining cannot be applied to characters that are rotated 90°clockwise and inverted.
  - When the underline mode is canceled, the following characters are not underlined and the width of the underscore does not change The default width is a point of width.
  - Changing the character size does not affect the current underline width.
  - Underline selection can also be canceled by **ESC!** To be set. The last executed command is valid.
  - This command does not affect the setting of the Chinese characters.

[Default] n = 0

[Reference] **ESC !**

### 16. ESC 2 Set the default line spacing

[Format]	ASCII code	ESC	2
	Hexadecimal code	1B	32
	Decimal code	27	50
[Description]	Select approximately 3.75mm line spacing.		
[Note]	• Line spacing is independent in standard mode and page mode.		
[Reference]	<b>ESC 3</b>		

**17. ESC 3 n Set the line spacing**

[Format]	ASCII code	ESC	3	n
	Hexadecimal code	1B	33	n
	Decimal code	27	51	n
[Range]	$0 \leq n \leq 255$			
[Description]	Set the line spacing to [n×movement units longitudinal or lateral] inches.			
[Note]	<ul style="list-style-type: none"> <li>•Line spacing settings are independent of each other in the standard mode and page mode.</li> <li>•The lateral and longitudinal movement units are set by <b>GS P</b>. Changing this setting does not affect the current line spacing.</li> <li>•In standard mode, movement units longitudinal.</li> <li>•In the page mode, choose to use the lateral or longitudinal movement units based on the direction of the print area and the printing start position, which are as follows:               <ol style="list-style-type: none"> <li>1. When the printing start position is set to the the position of upper left corner or the lower right corner of the printing area by <b>ESC T</b>, the longitudinal movement unit is used;</li> <li>2. When the printing start position is set to the position of lower left corner or the upper right corner of the printing area by <b>ESC T</b>, the lateral movement unit is used;</li> </ol> </li> <li>•The maximum travel distance is 956 mm. If this distance is exceeded, the maximum distance is taken.</li> </ul>			
[Default]	The default row height is approximately 3.75mm.			
[Reference]	<b>ESC 2, GS P</b>			

**18. ESC=n Select the printer**

[Format]	ASCII code	ESC	=	n
	Hexadecimal code	1B	3D	n
	Decimal code	27	61	n
[Range]	$0 \leq n \leq 1$			
[Description]	Select a printer that can receive the data sent by the host computer:			

Bit	1/0	Hexadecimal code	Decimal code	Function
0	0	00	0	Printer prohibited
	1	01	1	Printer allowed
1-7		---	---	Undefined

[Note]	<ul style="list-style-type: none"> <li>•When the printer is prohibited, all other commands are ignored except for the real-time commands (DLE EOT, DLE ENQ, DLE DC4).</li> </ul>
[Default]	n = 1

**19. ESC? N Cancel the user-defined characters**

[Format]	ASCII code	ESC	?	n
	Hexadecimal code	1B	3F	n
	Decimal code	27	63	n
[Range]	$32 \leq n \leq 127$			
[Description]	Cancel the user-defined characters			
[Note]	<ul style="list-style-type: none"> <li>•Cancels the code n character in the user-defined character. When it is canceled, this character uses an internal font library.</li> </ul>			

- If the custom character does not exist, the command is ignored.

[Reference] **ESC &, ESC %**

## 20. ESC@ Initialize printer

[Format]	ASCII code	ESC	@
	Hexadecimal code	1B	40
	Decimal code	27	64
[Description]	Clear the print buffer data and the print mode is set to the default mode when it is power-up.		
[Note]	•The setting of the DIP switch is not tested once again.		
	•Excluding data retention in the receive buffer.		
	•The macro definition is preserved.		
	•NV Bitmap data will not be erased.		
	•The user NV memory data will not be erased.		

## 21. ESC D n1... nk NUL sets the lateral skip position

[Format]	ASCII code	ESC	D	n1...nk	NUL
	Hexadecimal code	1B	44	n1...nk	00
	Decimal code	27	68	n1...nk	0
[Range]	$1 \leq n \leq 255$				
	$0 \leq k \leq 32$				
[Description]	Sets the lateral skip position.				
	<ul style="list-style-type: none"> <li>•Set a skip position in the nth column from the beginning of the row.</li> <li>•There are a total of k skip positions.</li> </ul>				
[Note]	•The lateral skip position is calculated as follows:				
	Character width×n, including the spacing of the right. If the character is double in width, the skip distance is doubled.				
	•This command cancels the previous skip position setting.				
	•When n=8, the current position is the 9th column.				
	•A maximum of 32(k=32) skip positions are set, and data of more than 32 skip positions are processed as normal data.				
	•The skip position are arranged in the ascending order, and the ending symbol is NUL.				
	•When [n] k is less than or equal to the previous value of [n] k-1, the skip setting ends and the subsequent data is processed as normal data.				
	•ESC D NUL cancels all skip position settings.				
	•By changing the character width, the previously specified skip position does not change.				
[Default]	•Character widths are independent in standard mode and page mode.				
	The default tick setting is one skip position for every 8 standard ASCII characters (12×24) (columns 9, 17, 25,...).				

[Reference] **HT**

## 22. ESCEn Select/cancel bold mode

[Format]	ASCII code	ESC	E	n
	Hexadecimal code	1B	45	n
	Decimal code	27	69	n
[Range]	$0 \leq n \leq 255$			
[Description]	Select or cancel bold mode			
	When the least significant bit of n is 0, the bold mode is canceled.			

	When the least significant bit of n is 1, the bold mode is selected.
[Note]	<ul style="list-style-type: none"> <li>• n Only the least significant bit is valid.</li> <li>• <b>ESC!</b> Also the bold mode can be selected/canceled, and the last received command is valid.</li> </ul>
[Default]	n = 0
[Reference]	<b>ESC !</b>

### 23. ESC G n Select/cancel dual print mode

[Format]	ASCII code	ESC	G	n
	Hexadecimal code	1B	47	n
[Range]	Decimal code	27	71	
	$0 \leq n \leq 255$			
[Description]	Select/cancel dual print mode <ul style="list-style-type: none"> <li>• When the lowest bit of n is 0, the dual print mode will be canceled.</li> <li>• When the lowest bit of n is 1, the dual print mode will be selected.</li> </ul>			
[Note]	<ul style="list-style-type: none"> <li>• n Only the least significant bit is valid.</li> <li>• This command works the same as the bold printing.</li> </ul>			
[Default]	n = 0			
[Reference]	ESC E			

### 24. ESC J n Print and paper skip

[Format]	ASCII code	ESC	J	n
	Hexadecimal code	1B	4A	n
	Decimal code	27	74	n
[Range]	$0 \leq n \leq 255$			
[Description]	Prints buffer data and paper skip [n×movement units longitudinal or lateral] inches.			
[Note]	<ul style="list-style-type: none"> <li>• After printing, the current print position will be placed at the beginning of the line.</li> <li>• The paper travel distance is not affected by the <b>ESC 2</b> or <b>ESC 3</b> command settings.</li> <li>• The lateral and the longitudinal movement units are set by <b>GS P</b>.</li> <li>• In standard mode, movement units longitudinal.</li> <li>• In the page mode, you can select to use the longitudinal movement unit or the lateral movement unit in line with the direction of the printing area and the printing start position as follows:</li> </ul>			
	<ol style="list-style-type: none"> <li>1. When the printing start position is set to the the position of upper left corner or the lower right corner of the printing area by <b>ESC T</b>, the longitudinal movement unit is used;</li> <li>2. When the printing start position is set to the position of lower left corner or the upper right corner of the printing area by <b>ESC T</b>, the lateral movement unit is used;</li> </ol>			
	<ul style="list-style-type: none"> <li>• The maximum travel distance is 956 mm. If this distance is exceeded, the maximum distance is taken.</li> </ul>			
[Reference]	<b>GS P</b>			

### 25. ESC L Select the page mode

[Format]	ASCII code	ESC	L
	Hexadecimal code	1B	4C
	Decimal code	27	76
[Description]	Transition from the standard mode to the page mode.		

[Note]

- This command is only valid at the beginning of the line in the standard mode.
- In page mode, the command has no effect.
- When **FF** or **ESC s** is executed, the printer will return to the standard mode.
- This command sets the print position to the position which is determined by the **ESC T** command and the **ESC W** command.
- This command converts the settings of the following commands (where values can be set separately in standard mode and page mode) to the values in the page mode:
  1. Setting character spacing right: **ESC SP, FS S**
  2. Set the line spacing: **ESC 2, ESC 3**
- The following command changes the flag bit only in the page mode and takes effect after switching to the standard mode.
  1. Rotate 90°clockwise: **ESC V**
  2. Select the alignment mode: **ESC a**
  3. Select the inversion mode: **ESC{**
  4. Set left margin: **GS L**
  5. Set printing area width: **GS W**
- In the page mode, ignore the following commands:
  1. Execute the testing print: **GS (A**
- The following commands are not available in the page mode:
  1. Print the NV Bitmap: **FS p**
  2. Define the NV Bitmap: **FS q**
  3. Write user NV memory: **FS g 1**
  4. Print raster bitmap: **GS v 0**
- When the power is turned off, the printer is reset, or the **ESC@** command is executed, the printer will return to the standard mode.

[Reference]

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

## 26. **ESC M n** Select typeface

[Format]	ASCII code	ESC	M	n
	Hexadecimal code	1B	4D	n
	Decimal code	27	77	n
[Range]	n = 0, 1, 48, 49			
[Description]	Select typeface			

n	Function
0, 48	Select standard ASCII typeface (12×24)
1, 49	Select compressed ASCII typeface (9×17)

## 27. **ESCRn** Select international character set

[Format]	ASCII code	ESC	R	n
	Hexadecimal code	1B	52	n
	Decimal code	27	82	n
[Range]	0 ≤ n ≤ 15			
[Description]	Select an international character set n from the following table:			



n	Character set
0	The United States
1	France
2	Germany
3	U. K.
4	Denmark I
5	Sweden
6	Italy
7	Spain I
8	Japan
9	Norway
10	Denmark II
11	Spain II
12	Latin America
13	Korea
14	Slovenia/Croatia
15	China

[Default]                    n = 0

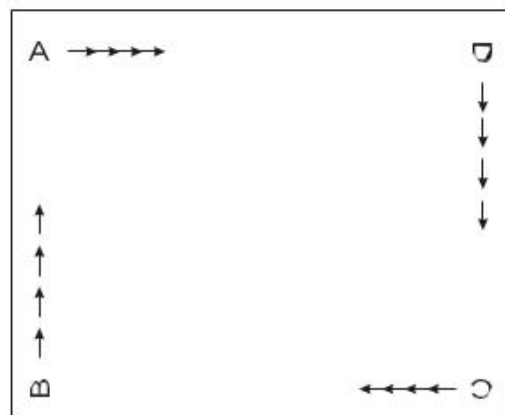
## 28. ESCS Select the standard mode

[Format]	ASCII code	ESC	S
	Hexadecimal code	1B	53
	Decimal code	27	83
[Description]	Set standard mode		
[Note]	<ul style="list-style-type: none"> <li>•This command is valid in the page mode.</li> <li>•This command clears the page buffer print data.</li> <li>•This command places the current position at the beginning of the line.</li> <li>•The page mode area is initialized to the default value.</li> <li>•This command converts the settings of the following commands to values in the standard mode:               <ol style="list-style-type: none"> <li>1. Set the right spacing: <b>ESC SP, FS S</b></li> <li>2. Select the line spacing: <b>ESC 2, ESC 3</b></li> </ol> </li> </ul>		
	<ul style="list-style-type: none"> <li>•The following commands can be used to set relevant parameters in the standard mode, but their settings are not effective until they enter the page mode:               <ol style="list-style-type: none"> <li>1. Set the printing area in the page mode: <b>ESC W</b></li> <li>2. Set the area direction in the page mode: <b>ESC T</b></li> </ol> </li> <li>•The following command is ignored in the standard mode:               <ol style="list-style-type: none"> <li>1. Set longitudinal absolute printing position in the page mode: <b>GS \$</b></li> <li>2. Set the relative printing position in the page mode: <b>GS\</b></li> </ol> </li> <li>•The printer returns to the standard mode after the printer hardware reset or the <b>ESC@</b> command is executed.</li> </ul>		
[Reference]	<b>FF, ESC FF, ESC L</b>		

## 29. ESC T n Select the printing area direction in the page mode

[Format]	ASCII code	ESC	T	n
	Hexadecimal code	1B	54	n
	Decimal code	27	84	n
[Range]	$0 \leq n \leq 3$ $48 \leq n \leq 51$			
[Description]	Select the direction and start position of the print area in the page mode.			
	n Specify the direction and start position of the printing area:			

n	Print direction	Start position
0.48	Left to right	Upper left (A in the figure)
1.49	From the bottom to the top	Lower left (B in the figure)
2.50	From the right to the left	Lower right (C in the figure)
3.51	From the top to the bottom	Upper right (D in the figure)



[Note]	•If the current mode is the standard mode, only the internal flag bit is set without affecting the printing.
	•This command sets the start position of the print content in the printing area.
	•Depending on the starting area of printing, the use of lateral or longitudinal movement units is also different:
	1. If the printing start position is at the position of upper left corner or lower right corner of the printing area, the arrangement direction of the printed contents is perpendicular to the printing feeding direction.
	The following commands employ lateral movement units: <b>ESC SP, ESC \$, ESC \</b>
	The following commands utilize longitudinal movement units: <b>ESC 3, ESC J, GS \$, GS \</b>
	2. If the start position of the printer is the position of lower left corner or the upper right corner of the printing area, the arrangement direction of the printed contents is the same as the paper feeding direction of the printer.
	The following commands employ lateral movement units: <b>ESC 3, ESC J, GS \$, GS \</b>
	The following commands utilize longitudinal movement units: <b>ESC SP, ESC \$, ESC \</b>
[Default]	n = 0
[Reference]	<b>ESC \$, ESC L, ESC W, ESC \, GS \$, GS P, GS \</b>

### 30. ESC V n Select/cancel 90 degrees clockwise rotation

[Format]	ASCII code	ESC	V	n
	Hexadecimal code	1B	56	n
	Decimal code	27	86	n
[Range]	$0 \leq n \leq 1$ , $48 \leq n \leq 49$			
[Description]	Select/cancel 90 degrees clockwise rotation			
	The value of n is as follows:			

n	Function
0, 48	Cancel clockwise 90 degrees mode
1, 49	Select clockwise 90 degree rotation mode

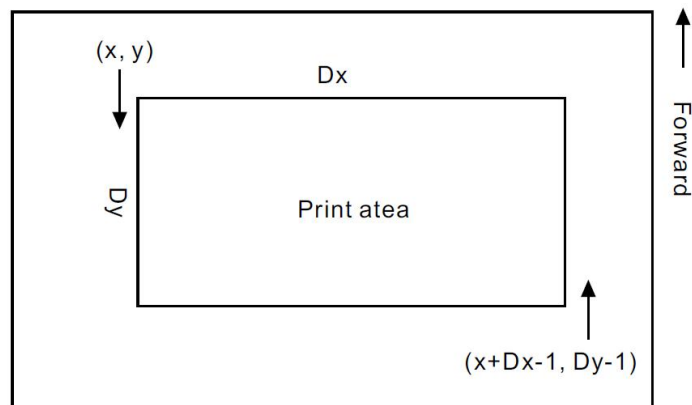
- [Note]
- This command is only valid in the standard mode.
  - When the underline mode is selected, the underline cannot be rotated 90 degrees clockwise and no underline is added to printing.
  - The double height and the double width in the 90 degree clockwise rotation mode are opposite to those in the normal mode.

[Default] n = 0

[Reference] **ESC !, ESC -**

### 31. Set the printing area **ESC WxLxHyLyHdxLdxHdyLdyH** in the page mode

- |          |                  |     |                                |
|----------|------------------|-----|--------------------------------|
| [Format] | ASCII code       | ESC | W xL xH yL yH dxL dxH dyL dyH  |
|          | Hexadecimal code | 1B  | 57 xL xH yL yH dxL dxH dyL dyH |
|          | Decimal code     | 27  | 87 xL xH yL yH dxL dxH dyL dyH |
- [Range]  $0 \leq xL, xH, yL, yH, dxL, dxH, dyL, dyH \leq 255$  (except  $dxL=dxH=0$  or  $dyL=dyH=0$ )
- [Description]
- Set the area lateral start position, longitudinal start position, area width, and height as follows:  
 Lateral start position:  $x0 = [ (xL+xH \times 256) \times \text{unit of lateral movement} ]$   
 Longitudinal start position:  $y0 = [ (yL+yH \times 256) \times \text{unit of longitudinal movement} ]$   
 Printing area width:  $dx = [ dxL+dxH \times 256 ] \times \text{lateral movement unit}$   
 Printing area height:  $dy = [ dyL+dyH \times 256 ] \times \text{unit of longitudinal movement}$
- [Note]
- This command sets only the internal flag bit in the standard mode and does not affect printing.
  - If the lateral start position or the longitudinal start position exceeds the print area, the printer stops processing the command, and the subsequent data is processed as normal.
  - If the width or height of the print area is set to 0, the printer stops processing the command, and the subsequent data is processed as normal data.
  - This command, in conjunction with the **ESC T** command, determines the current printing position.
  - If the value of lateral start position+print area width exceeds the printable area, the width of the printing area is automatically adjusted to lateral printable width-lateral start position.
  - If the longitudinal start position+print area height value exceeds the printable area, the height of the printing area is automatically adjusted to longitudinal printable height-longitudinal start position.
  - The lateral and longitudinal movement units are specified by **GS P**. Changing the lateral and longitudinal movement units does not change the current printing area.
  - Set the lateral start position and area width in the lateral movement units, and set the longitudinal start position and the area height in the longitudinal movement units.
  - Assuming that the lateral start position, longitudinal start position, printing area width and printing area height are X, Y, Dx, Dy, the setting of the printing area is as shown in the following figure:



The printable area of the printer is about 73 mm in the lateral direction and about 150 mm in the longitudinal direction.

[Default]  $xL = xH = yL = yH = 0$   
 $dxL = 72, dxH = 2, dyL = 176, dyH = 4$

[Reference] **CAN, ESC L, ESC T, GS P**

### 32. ESC \nL nH Set the relative landscape printing position

[Format]	ASCII code	ESC	\	nL	nH
	Hexadecimal code	1B	5C	nL	nH
	Decimal code	27	92	nL	nH

[Range]  $0 \leq nL \leq 255 \quad 0 \leq nH \leq 255$

[Description] Set the lateral relative displacement in lateral or longitudinal movement units.

- This command sets the print position to  $[(nL + nH \times 256) \times \text{units of lateral or longitudinal movement}]$  from the current position.

[Note] • Settings that exceed the printable area are ignored.

- When the printing position moves to the right:  $nL + nH \times 256 = N$ .

Use complement when the printing position moves to the left:  $nL + nH \times 256 = 65536 - N$ .

- The print start position is moved from the current position to  $[N \times \text{units of lateral and longitudinal movement}]$ .

- The units of lateral and longitudinal movement are set by the **GS P** command.

- In the standard mode, use lateral movement units.

- In the page mode, you can choose to use either a lateral or longitudinal movement units, based on the direction and start position of the print area, as follows:

1. When the printing start position is set to the position of upper left corner or the lower right corner of the printing area by **ESC T**, the lateral movement unit is used;

2. When the printing start position is set to the position of lower left corner or the upper right corner of the printing area by **ESC T**, the longitudinal movement unit is used;

[Reference] **ESC \$, GS P**

### 33. ESC a Select alignment method

[Format]	ASCII code	ESC	a	n
	Hexadecimal code	1B	61	n
	Decimal code	27	97	n

[Range]  $0 \leq n \leq 2, 48 \leq n \leq 50$

[Description] Make all print data be arranged in a specified alignment method.  
The corresponding relationship between the value of n and the alignment method is as follows:

n	Alignment method
0, 48	Left justifying
1, 49	Center alignment
2, 50	Right justifying

[Note]

- This command is only valid at the beginning of the line in standard mode.
- This command changes only the internal flag bit in page mode.
- This command performs the alignment in the printing area.
- This command adjusts the blank spacing based on **HT**, **ESC \$**, or **ESC\** commands.

[Default] n = 0

[Instances]

A B C
A B C D
A B C D E

Left justifying

A B C
A B C D
A B C D E

Centered

A B C
A B C D
A B C D E

Right justifying

### 34. ESC c 3 n Select the print paper sensor to output the paper missing signal

[Format]	ASCII code	ESC	c	3	n
	Hexadecimal code	1B	63	33	n
	Decimal code	27	99	51	n

[Range]  $0 \leq n \leq 255$

[Description]

- Select the print paper sensor to output the paper missing signal.
- The use of each bit of the parameter n is shown in the following table:

Bit	Off/On	Hexadecimal	Decimal	Function
0	Off	00	0	Prohibit paper exhaustion sensor
	On	01	1	Allow paper exhaustion sensor
1	Off	00	0	Prohibit paper exhaustion sensor
	On	02	2	Allow paper exhaustion sensor
2	Off	00	0	Prohibit print the paper end sensor
	On	03	3	Allow print the paper end sensor
3	Off	00	0	Prohibit print the paper end sensor
	On	04	4	Allow print the paper end sensor
4-7	-	-	-	Undefined

[Description]

- A plurality of sensors may be selected to output signals. If any of the sensors detects the shortage of papers, a paper out signal is shown.
- This command is valid only on parallel interfaces and is ignored in serial interface mode.
- Convert sensors when it is executing this command. Delay the conversion of the paper shortage signal based on the received buffer status.
- If Bit 0 or Bit 1 is ON, the paper exhaustion sensor is selected as the print paper sensor to output a paper out signal.
- If Bit 2 or Bit 3 is ON, the print the paper end sensor is selected as the print paper sensor to

output a paper out signal.

- When all sensors are prohibited, a printing paper presence signal is always output as a printing paper current status.

[Default] n=15

**35. ESC c 4 n** Select the print paper sensor to stop printing

[Format]	ASCII code	ESC	c	4	n
	Hexadecimal code	1B	63	34	n
	Decimal code	27	99	52	n

[Range]  $0 \leq n \leq 255$

- [Description]
- Select the print paper sensor to output the paper missing signal.
  - The use of each bit of the parameter n is shown in the following table:

Bit	Off/On	Hexadecimal	Decimal	Function
0	Off	00	0	Prohibit paper exhaustion sensor
	On	01	1	Allow paper exhaustion sensor
1	Off	00	0	Prohibit paper exhaustion sensor
	On	02	2	Allow paper exhaustion sensor
2-7	-	-	-	Undefined

- [Note]
- When using this command to allow a print paper sensor to be active, printing is stopped only when the corresponding paper is selected for the printing.
  - When the roll paper sensor detects the end of the printing paper, the printer stops printing and enters the offline status.
  - When Bit 0 or Bit 1 is ON, the printer selects the paper exhaustion sensor as the print paper sensor to stop printing.

[Default] n = 0

**36. ESC c 5 n** Enable/prohibited button

[Format]	ASCII code	ESC	c	5	n
	Hexadecimal code	1B	63	35	n
	Decimal code	27	99	53	n

[Range]  $0 \leq n \leq 255$

[Description] Enable/prohibited button

- The key is activated when the lowest bit of n is 0.
  - The key is prohibited when the least significant bit of n is 1.
- [Note]
- Only the least significant bit of n is valid.
  - When a key is prohibited, the key does not work.
  - Keys are always available when macro commands are executed.

[Default] n = 0

**37. ESC d n** Print and advance forward n lines

[Format]	ASCII code	ESC	d	n
	Hexadecimal code	1B	64	n
	Decimal code	27	100	n

[Range]  $0 \leq n \leq 255$

[Description] Prints the data in the buffer and advances forward n lines (lines of characters).

- [Note]
- This command sets the printing start position of the printer at the beginning of the line.
  - This command does not affect the row spacing set by **ESC 2** or **ESC 3**.
  - The maximum paper feed distance is 1016 mm. When the set value is larger than 1016 mm, the maximum value is taken.

[Reference] **ESC 2, ESC 3**

### 38. ESC pm t1 t2 generates cash drawer control pulse

[Format]	ASCII code	ESC	p	m	t1	t2
	Hexadecimal code	1B	70	m	t1	t2
	Decimal code	27	112	m	t1	t2

[Range] m = 0, 1, 48, 49  
 $0 \leq t1 \leq 255, 0 \leq t2 \leq 255$

[Description] Outputs the cash drawer opening pulse set by t1 and t2 to the pin which is designated by m:

M	Connecting pin
0, 48	Pin 2 of cash drawer socket
1, 49	Pin 5 of cash drawer socket

- [Note]
- The high-level time of the cash drawer opening pulse is  $[t1 \times 2 \text{ ms}]$ , and the flat time of the low point is  $[t2 \times 2 \text{ ms}]$ .
  - If  $t2 < t1$ , the time for low level is  $[t1 \times 2 \text{ ms}]$ .

[Reference] **DLE DC4**

### 39. ESCtn Select character code table

[Format]	ASCII code	ESC	t	n
	Hexadecimal code	1B	74	n
	Decimal code	27	116	n

[Range]  $0 \leq n \leq 10, 16 \leq n \leq 19$

[Description] Select Page n from the character code table:

n	Page
0	PC437 [US, European Standard]
1	Katakana
2	PC850 [Multilingual]
3	PC860 [Portuguese]
4	PC863 [Canada-French]
5	PC865 [Northern Europe]
6	West Europe
7	Greek
8	Hebrew
9	PC755:East Europe
10	Iran
16	WPC1252
17	PC866:Cyrillice*2
18	PC852:Latin2
19	PC858

[Default]            n = 0

**40. ESC{n** Select/Cancel inverted print mode

[Format]	ASCII code	ESC	{	n
	Hexadecimal	1B	7B	N
	Decimal	27	123	n

[Range]             $0 \leq n \leq 255$

[Description]      Select/Cancel inverted print mode

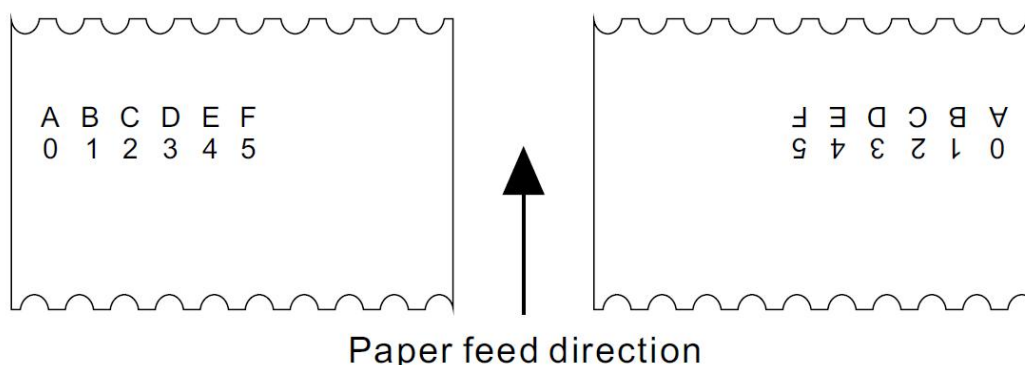
- When the lowest bit of n is 0, the inverted print mode is canceled.
- When the lowest bit of n is 1, the inverted print mode is selected.

[Note]

- Only the least significant bit of n is valid;
- This command is only valid at the beginning of the line in standard mode.
- This command changes only the internal flag bit in the page mode.
- This command has no effect on the page mode printing.
- In the inverted print mode, the printer rotates the lines to be printed by 180 degrees and then prints.

[Default]            n = 0

[Instances]



**41. FS p n m** Print bitmap and download it to FLASH

[Format]	ASCII code	FS	p	n	m
	Hexadecimal code	1C	70	n	m
	Decimal code	28	112	n	m

[Range]             $1 \leq n \leq 255$     $0 \leq m \leq 3$  ,  $48 \leq m \leq 51$

[Description]      Print the bitmap and download it to FLASH in the mode specified by m.

m	Mode	Longitudinal resolution (DPI)	Lateral resolution (DPI)
0, 48	Normal	200	200
1, 49	Double width	200	100
2, 50	Double height	100	200
3, 51	Double width and double height	100	100

- n denotes the drawing number of the bitmap (defined by the command **FS q**).
- m Specify the mode in which the bitmap is printed.



[Details]	<ul style="list-style-type: none"> <li>Flash bitmap is a bitmap which is defined by command <b>FS q</b> and stored in the Flash memory and printed with command <b>FS p</b>.</li> <li>This command has no effect when the Flash bitmap is not defined.</li> <li>In the standard mode, this command is valid only if there is no data in the print buffer.</li> <li>This command is not affected by other print modes except the inverted print mode (e. g. bold printing, overlay printing, double height, double width, underline, character enlargement, white print, 90 degrees clockwise rotation, and so on).</li> <li>If the downloaded bitmap which is to be printed exceeds the current print area, the excess is not printed.</li> <li>In normal and double width modes, the command feeds the <b>n</b> point, where <b>n</b> is the <b>NV</b> bitmap height. In the double height and quadruple size modes, the command feeds <b>n×2</b> points, where <b>n</b> is the <b>NV</b> bitmap height, regardless of the line spacing set by <b>ESC 2</b> or <b>ESC 3</b>.</li> <li>After the bitmap is printed, the printer wraps lines and processes the subsequent data in normal mode.</li> </ul>			
[Reference]	<b>ESC *, FS q, GS /, GS v 0</b>			
	<b>42 FS q n [xL xH yL yH d1...dk]1...[xL xH yL yH d1...dk]n</b> Define the <b>Flash</b> Bitmap			
[Format]	ASCII code	FS	q	n [ xL xH yL yH d1...dk]...[ xL xH yL yH d1...dk]
	Hexadecimal code	1C	71	n [xL xH yL yH d1...dk]...[ xL xH yL yH d1...dk]
	Decimal code	28	113	n [xL xH yL yH d1...dk]...[ xL xH yL yH d1...dk]
[Range]	$1 \leq n \leq 255$			
	$0 \leq xL \leq 255$			
	$1 \leq (xL + xH \times 256) \leq 1023$			
	$1 \leq (yL + yH \times 256) \leq 288$			
	$0 \leq d \leq 255$			
	$k = (xL + xH \times 256) \times (yL + yH \times 256) \times 8$			
	Flash download capacity is up to 8096 bytes			
[Description]	Define the Flash Bitmap:			
	<ul style="list-style-type: none"> <li><b>n</b> specify the number of Flash bitmaps to be defined.</li> </ul>			
	<ul style="list-style-type: none"> <li><b>xL, xH</b> specify the number of lateral points of the flash bitmap <math>(xL+xH \times 256) \times 8</math>.</li> </ul>			
	<ul style="list-style-type: none"> <li><b>yL, yH</b> specify the number of longitudinal points of the Flash bitmap <math>(yL+yH \times 256) \times 8</math>.</li> </ul>			
[Note]	<ul style="list-style-type: none"> <li>Frequent execution of this command can damage the Flash memory. It is recommended that you write Flash up to 10 times a day.</li> </ul>			
	<ul style="list-style-type: none"> <li>This command deletes all Flash bitmaps previously defined by the command. The printer cannot redefine one of the previously defined bitmaps, in which case all data must be resent.</li> </ul>			
	<ul style="list-style-type: none"> <li>Since the printer is busy during the processing of the command, it writes data to Flash and stops receiving other commands, and therefore, during the execution of the command, sending other commands to the printer, including real-time commands, is prohibited.</li> </ul>			
	<ul style="list-style-type: none"> <li>Flash bitmap is a bitmap which is defined by command <b>FS q</b> and stored in the Flash memory and printed with command <b>FS p</b>.</li> </ul>			
	<ul style="list-style-type: none"> <li>In the standard mode, this kind of command is only valid at the beginning of a line.</li> </ul>			
	<ul style="list-style-type: none"> <li>Seven bytes of data from FS to yH are processed as the command data and are not part of the graphics data.</li> </ul>			
	<ul style="list-style-type: none"> <li>When the bitmap data byte count exceeds the range defined by xL, xH, yL, yH to its left, the printer only processes data in the range defined by xL, xH, yL, yH.</li> </ul>			

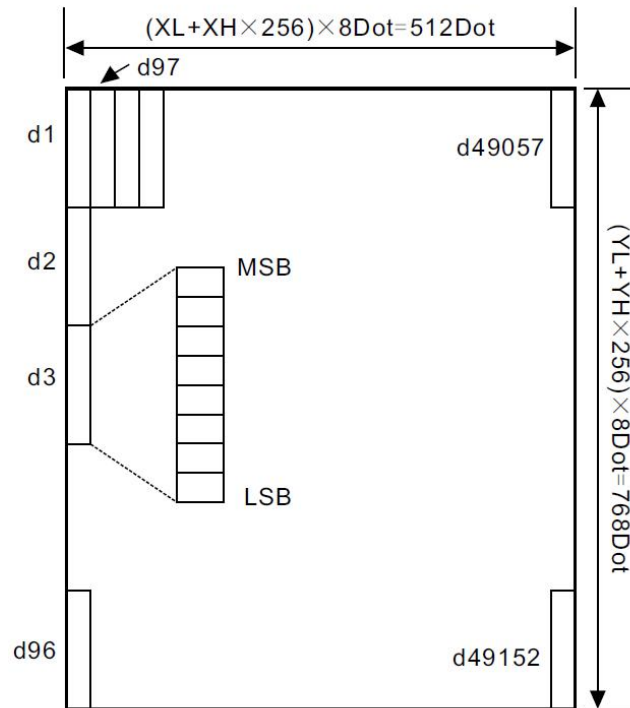
- In that first set of flash bitmap, this command has no effect when any of the parameter xL, xH, yL, yH are out of the defined range.
- When we are downloading multiple bitmaps, if the printer processes xL, xH, yL, yH beyond the defined range, the printer stops executing this command. Bitmaps after this are not valid in the command. Bitmaps preceding this are valid.
- d is defined bitmap data, in which the corresponding bit of 1 indicates that the point will be printed, and 0 indicates that there is no printing.
- This command defines n Flash bitmaps. The sequence number of each bitmap increases from number 1, so the first data group [xL xH yL yH d1... dk] is the data of Flash bitmap 1 and the last data group [xL xH yL yH d1.. . dk] is the data of Flash bitmap n. This is also true when printing bitmaps are with the **FS p** command.
- The data defining a Flash bitmap consists of [xL xH yL yH d1... dk] . Therefore, when there is only one bitmap, n=1. The number of bytes of Flash memory employed by the printer is as follows:  
[Number of sub-nodes in bitmap data:(xL+xH×256)×(yL+yH×256)×8]+[Header information: 4]
- In the printer, the maximum Flash download spacing is 64K bits (8K bytes). This command can define multiple Flash bitmaps, but it cannot define a bitmap whose size exceeds the 64K bits (the download spacing varies with different printers, please refer to the printer configuration information).
- The printer is busy immediately before it writes Flash.
- In processing the command, the printer does not transfer the status nor carries out a status query.
- When the command is accepted during macro definition, the printer ends the macro definition and begins to execute the command.
- If a Flash bitmap is defined, it cannot be erased by executing **ESC@** commands, resetting, and powering down.
- This command only defines the Flash bitmap and does not execute the printing task. The **FS p** command is used to print the Flash bitmap.

[Reference]

**FS p**

[Instances]

When xL=64, xH=0, yL=96, yH=0



#### 43. GS! n Select the character size

[Format]	ASCII code	GS	!	n
	Hexadecimal code	1D	21	n
	Decimal code	29	33	n
[Range]	0 ≤ n ≤ 255			
	(1 ≤ longitudinal magnification ration ≤ 8, 1 ≤ lateral amplification ration ≤ 8)			
[Description]	Use 0 to 2 bits to select character height and 4 to 7 bits to select character width			
As follows:				

Bit	0/1	Hexadecimal code	Decimal code	Function	
0-3	For character height selection, see the Table 2				
4-7	For character width selection, see the Table 1				
Table 1			Table 2		
Character width selection			Character height selection		
Hexadecimal code	Decimal code	Lateral magnification	Hexadecimal code	Decimal code	Longitudinal magnification
00	0	1 (Normal)	00	0	1 (Normal)
10	16	2 (2 Double width)	01	1	2 (2 Double height)
20	32	3	02	2	3
30	48	4	03	3	4
40	64	5	04	4	5
50	80	6	05	5	6
60	96	7	06	6	7
70	112	8	07	7	8

- [Note] • This command is valid for all characters (ASCII and Kanji), except for the HRI characters.  
If n is outside the specified range, this command is ignored.
- In standard mode, the longitudinal direction is the paper feed direction and the lateral direction is the direction perpendicular to the paper feed direction. But when the character is rotated 90°clockwise, the lateral and longitudinal are reversed.
  - In the page mode, the landscape and portrait depend on the orientation of the region.
  - When the magnification of a character on the same line is different, all characters will be underlined.
  - **ESC!** The command can also select or cancel the double width and height of the characters, and the last received command is valid.

[Default] n = 0

[Reference] **ESC !**

#### 44. Set longitudinal absolute position in the **GS \$nL nH** page mode

[Format]	ASCII code	GS	\$	nL nH
	Hexadecimal code	1D	24	nL nH
	Decimal code	29	36	nL nH
[Range]	$0 \leq nL \leq 255, 0 \leq nH \leq 255$			
[Description]	• Sets the absolute longitudinal position in the page mode.			
	• This command sets the absolute position to the [(nL+nH×256) x (movement units longitudinal or lateral)] inches.			
[Note]	• This command is valid only in the page mode.			
	• This command is ignored if the value of [(nL+nH×256) × movement units longitudinal or lateral] exceeds the set print area.			
	• The lateral position will not change after the command is executed			
	• The reference position is set by the <b>ESC T</b> command.			
	• Depending on the print area direction and the start position set by the <b>ESC T</b> command, the command causes the printer to operate as follows:			
	① If the print start position is either the upper left corner or the lower right corner, this command sets the absolute position in the direction parallel to the paper feed direction.			
	② If the print start position is either the upper right corner or the lower left corner, this command sets the absolute position in the direction which is perpendicular to the paper feed direction.			
	• The units of lateral and longitudinal movement are set by the <b>GS P</b> command.			

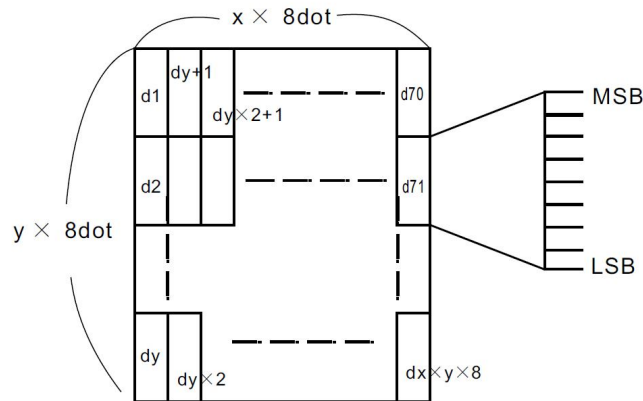
[Reference] **ESC \$, ESC T, ESC W, ESC \, GS P, GS \**

#### 45. **GS\*x y d1... d (x×y×8)** Define the download bitmap

[Format]	ASCII code	GS	*	x y d1...d(x × y × 8)
	Hexadecimal code	1D	2A	x y d1...d(x × y × 8)
	Decimal code	29	42	x y d1...d(x × y × 8)
[Range]	$1 \leq x \leq 255, 1 \leq y \leq 48$			
	$x \times y \leq 912$			
	$0 \leq d \leq 255$			
[Description]	Define a download bitmap with points specified by x and y			
	<ul style="list-style-type: none"> <li>• x refers to the number of lateral points of the bitmap;</li> <li>• y is the number of points in the longitudinal direction of the bitmap.</li> </ul>			

[Note]

- The number of points in the bitmap lateral is  $x \times 8$ ; the number of points in the bitmap portrait is  $y \times 8$ .
- This command has no effect if  $x \times y$  is beyond the specified range.
- $d$  is bitmap data. The data corresponding bit is 1, which indicates that the point is printed, and a bit of 0 indicates no printing.
- The downloaded bitmap is cleared in the following cases:
  1. Execute the ESC@.
  2. Execute the ESC &.
  3. Execute the FS q.
  4. Reset the printer or turn off the power.
- The relationship between printing data and download bitmap is shown in the following figures:



[Reference] GS/

46. GS (A pL pH n m carries out the hexadecimal dump of print data

[Format]	ASCII code	GS	(	A	pL	pH	n	m
	Hexadecimal code	1D	28	41	pL	pH	n	m
	Decimal code	29	40	65	pL	pH	n	m
[Range]	pL=2, pH=0; n=0, 48 ;m=1, 49;							

47. GS/m Print download bitmap

[Format]	ASCII code	GS	/	m
	Hexadecimal code	1D	2F	m
	Decimal code	29	47	m
[Range]	$0 \leq m \leq 3, 48 \leq m \leq 51$			
[Description]	Print a download bitmap. The print mode is specified by m. The print mode that m chooses is as follows:			

m	Mode	Longitudinal resolution (DPI)	Lateral resolution (DPI)
0, 48	Normal	200	200
1, 49	Double width	200	100
2, 50	Double height	100	200
3, 51	Double width and double height	100	100

- [Note]
- This command will be ignored if the downloaded bitmap is not defined.
  - In the standard mode, this command is valid only if the print buffer has no data;
  - Except the inverted print mode, the other inverted print mode have no effect on this command (including bold, double, underline, font enlargement and reverse printing).
  - If the downloaded bitmap exceeds the print area, the excess will not be printed.
  - The command print bitmap is downloaded to RAM, not downloaded to FLASH. The corresponding drawing number is the drawing number which is set by **GS\*** command.

[Reference] **GS \***, **GS \***

#### 48. **GS**: Start/End macro definition

---

[Format]	ASCII code	GS	:
	Hexadecimal code	1D	3A
	Decimal code	29	58

[Description] Start/End macro definition.

- [Note]
- During normal operation, the printer receives the command to start macro definition. When a macro is defined, the printer receives the command to end the macro definition.
  - When the printer receives the **GS^** command while it is defining a macro, the macro definition is over and the macro definition is cleared.
  - When the printer powers up, there is no macro definition.
  - **ESC@** cannot clear the macro definition, so the macro definition content can include the **ESC@** command.
  - If the printer receives **GS** on the previous occasion: immediately after the former one, the printer remains macro undefined.
  - Macro definition content can be up to 2048 bytes. If the macro definition exceeds 2048 bytes, the excess data will be treated as normal data.

[Reference] **GS ^**

#### 49. **GSBn** Select/cancel black and white reverse print mode

---

[Format]	ASCII code	GS	B	n
	Hexadecimal code	1D	42	n
	Decimal code	29	66	n

[Range]  $0 \leq n \leq 255$

[Description] Select/cancel black and white reverse print mode.

- When the least significant bit of n is 0, the reverse print is canceled.
- When the least significant bit of n is 1, the reverse print is selected.

- [Note]
- n Only the least significant bit is valid.
  - This command is valid for all characters except the HRI characters.
  - When reverse print is selected, the character spacing which is set by the **ESC SP** command is also inverted.
  - This command does not affect bitmaps, custom bitmaps, bar-codes, the HRI characters, and white space set by **HT**, **ESC \$**, and **ESC\**.
  - This command will not affect the spacing between rows.
  - The black-and-white reverse print mode has a higher priority than the underline mode. The underline mode does not work when the black-and-white reverse print mode is selected. The underline mode is set only after the black-and-white reverse mode is canceled.

[Default] n = 0

**50. GS H n** Select the printing position of the **HRI** characters

[Format]	ASCII code	GS	H	n
	Hexadecimal code	1D	48	n
	Decimal code	29	72	n
[Range]	$0 \leq n \leq 3, 48 \leq n \leq 51$			
[Description]	When printing a bar-code, select a print location for the HRI character. n specify the HRI print position:			

n	Print location
0, 48	Do not print
1, 49	Above the bar-code
2, 50	Below the bar-code
3, 51	Print both above and below the bar-code

- The HRI is a character that comments on the contents of the bar-code.

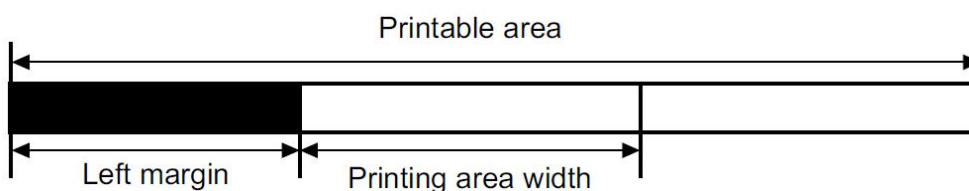
[Note] • The typeface of the HRI characters is designated by the **GS f** command.

[Default] n = 0

[Reference] **GS f, GS k**

**51. GS L nL nH** set the left margin

[Format]	ASCII code	GS	L	nL	nH
	Hexadecimal code	1D	4C	nL	nH
	Decimal code	29	76	nL	nH
[Range]	$0 \leq nL \leq 255$				
	$0 \leq nH \leq 255$				
[Description]	• Set the left margin by means of nL and nH;				
	• The left margin is set to $[(nL+nH \times 256) \times \text{lateral movement units}]$ inches.				



- [Note]
- In the standard mode, this command is only effective at the beginning of the line.
  - In the page mode, this command has no effect and the printer will treat the command as normal characters.
  - This command does not affect printing in the page mode.
  - If the setting exceeds the maximum available printing width, then the maximum available print width will be taken
  - The lateral and longitudinal movement units are set by the **GS P** command, and changing the longitudinal and lateral movement units does not affect the current left margin.

[Default] nL = 0, nH = 0

[Reference] **GS P, GS W**

**52. GS P x y** sets the lateral and longitudinal movement units

[Format]	ASCII code	GS	P	x	y
	Hexadecimal code	1D	50	x	y
	Decimal code	29	80	x	y
[Range]	$0 \leq x \leq 255$				
	$0 \leq y \leq 255$				
[Description]	<ul style="list-style-type: none"> <li>Set the lateral movement units to approximately 25.4/x mm (1/x inch) and the longitudinal movement units to 25.4/y mm (1/y inch), respectively.</li> <li>When x and y are 0, x and y are set as the default values.</li> </ul>				
[Note]	<ul style="list-style-type: none"> <li>The direction perpendicular to the paper feed direction is lateral, and the paper feed direction is the longitudinal direction.</li> <li>In the standard mode, the following commands use x or y, even if the character is rotated (inverted or rotated 90°clockwise does not change);               <ul style="list-style-type: none"> <li>① Commands by using x: <b>ESC SP, ESC \$, ESC \, FS S, GS L, GS W</b></li> <li>② Commands by using y: <b>ESC 3, ESC J, GS V</b></li> </ul> </li> <li>In the page mode, x or y is determined according to the direction of the area and the printing start position:               <ul style="list-style-type: none"> <li>① When the printing start position is set to the upper left corner (print direction from left to right) or the lower right corner (print direction from right to left) with the <b>ESC T</b> command:                   <ul style="list-style-type: none"> <li>Commands by using x: <b>ESC SP, ESC \$, ESC W, ESC \, FS S</b></li> <li>Commands by using y: <b>ESC 3, ESC J, ESC W, GS \$, GS \, GS V</b></li> </ul> </li> <li>② When the printing start position is set to the upper right corner (from top to bottom in the print direction) or the lower left corner (from bottom to top in the print direction) with the <b>ESC T</b> command:                   <ul style="list-style-type: none"> <li>Commands by using x: <b>ESC 3, ESC J, ESC W, GS \$, GS \</b></li> <li>Commands by using y: <b>ESC SP, ESC \$, ESC W, ESC \, FS S, GS V</b></li> </ul> </li> </ul> </li> <li>This command does not affect other settings which are previously set.</li> <li>The smallest unit of movement is the result of a combination of this very command and other commands.</li> <li>One inch is equal to 25.4 mm.</li> </ul>				
[Default]	x=200, y=200, where one movement unit is a print point. The lateral distance is about 1/8 mm and the longitudinal distance is about 1/7 mm.				
[Reference]	<b>ESC SP, ESC \$, ESC 3, ESC J, ESC W, ESC \, GS \$, GS L, GS V, GS W, GS \</b>				

**53. ① GS V m ② GS V m n** Select the paper cutting mode and cut paper

[Format]	①ASCII code	GS	V	m
	Hexadecimal code	1D	56	m
	Decimal code	29	86	m
	②ASCII code	GS	V	m n
	Hexadecimal code	1D	56	m n
	Decimal code	29	86	m n
[Range]	①m = 0, 48, 1, 49			
	②m = 66, $0 \leq n \leq 255$			
[Description]	Select the paper cutting mode and cut the paper.			
	Select the paper cutting mode based on the value of m as follows:			



M	Paper cutting mode
0, 48	Full cut
1, 49	Partial cut
66	Feed ( [n×(longitudinal movement units) inches] ) and partial cut of the paper

[Notes ① and ②]

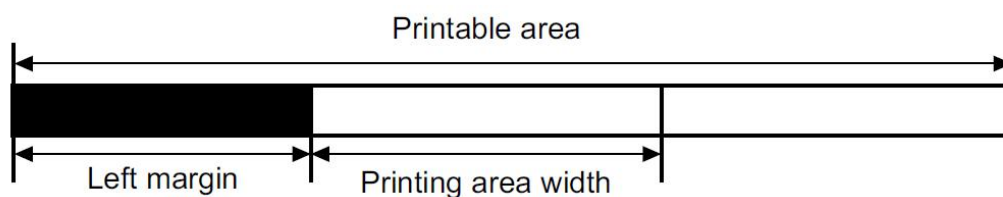
- This command is valid only at the beginning of the line.

[Note ①]

- M=0, 48, 1, 49, the printer cuts paper directly.
- When n=66, the printer feeds the paper [the distance from the printing position to the cutter+n×(longitudinal movement units) ] and then cuts the paper.
- The lateral and longitudinal movement units are set by the **GS P** command.
- The amount of paper feed is calculated in longitudinal movement units.

#### 54. **GS W nL nH** set printing area width

[Format]	ASCII code	GS	W	nL	nH
	Hexadecimal code	1D	57	nL	nH
	Decimal code	29	87	nL	nH
[Range]	$0 \leq nL \leq 255$				
	$0 \leq nH \leq 255$				
[Description]	Set the print area width by using nL and nH.				
	• Set the width of the printing area to $[(nL+nH \times 256) \times \text{lateral movement units}]$ inches.				



[Note]

- In the standard mode, this command is only valid at the beginning of the line.
- This command is not valid in the page mode. Command data will be treated as normal characters.
- This command does not affect the printing in the page mode.
- If [Left Margin+Print Area Width] exceeds the printable area, the print area width will be the printable area width minus the left margin.
- The units of lateral and longitudinal movement are set by the **GS P** command. Changing the lateral and longitudinal units of movement does not affect the current left margin and area width.
- The width of the plot area is calculated in units of lateral movement.

[Default] nL = 76, nH = 2

[Reference] **GS L, GS P**

#### 55. Set the longitudinal relative position in the **GS\nL nH** page mode

[Format]	ASCII code	GS	\	nL	nH
	Hexadecimal code	1D	5C	nL	nH
	Decimal code	29	92	nL	nH
[Range]	$0 \leq nL \leq 255$				
	$0 \leq nH \leq 255$				

[Description]	In the page mode, the longitudinal movement distance is set with the current point as the reference point.
	<ul style="list-style-type: none"> <li>• This command sets the longitudinal movement distance which is relative to the current point to <math>[(nL+nH \times 256) \times \text{units of longitudinal or lateral movement}]</math> inches.</li> </ul>
[Note]	<ul style="list-style-type: none"> <li>• This command is valid only in the page mode and is ignored in other modes.</li> <li>• When the printing position moves down: <math>nL+nH \times 256=N</math></li> <li>• When the print position moves up, use the complement to calculate: <math>NL+nH \times 256=65536-N</math></li> <li>• Any settings beyond the printing area are ignored.</li> <li>• This command determines the use of units of movement in accordance with the direction of the print area set by <b>ESC T</b>: <ul style="list-style-type: none"> <li>① When the printing start position is set to the upper left corner (from left to right in the print direction) or the lower right corner (from right to left in the print direction), use the longitudinal movement units.</li> <li>② When the printing start position is set to the upper right corner (from top to bottom in the print direction) or the lower left corner (from bottom to top in the printing direction), use the lateral movement units.</li> </ul> </li> <li>• The units of lateral and longitudinal movement are set by the <b>GS P</b> command.</li> <li>• The <b>GS P</b> command can change the units of lateral and longitudinal movement.</li> </ul>
[Reference]	<b>ESC \$, ESC T, ESC W, ESC \, GS \$, GS P</b>

#### 56. **GS ^ r t m** Execute macro commands

[Format]	ASCII code	GS	^	r	t	m
	Hexadecimal code	1D	5E	r	t	m
	Decimal code	29	94	r	t	m
[Range]	$0 \leq r \leq 255$ $0 \leq t \leq 255$ $m = 0, 1$					
[Description]	Execute macro commands. <ul style="list-style-type: none"> <li>• r Specifies the number of times which the macro is executed.</li> <li>• t Specifies the waiting time for the macro to execute.</li> <li>• m specifies the mode in which the macro is executed.</li> </ul> When the least significant bit of m is 0: The macro is executed r times which is consecutively with an interval of $t \times 100$ ms. When the least significant bit of m is 1: After the printer waits $t \times 100$ ms, the indicator flashes until the user presses the paper feed key before the printer executes the macro. This is repeated r times.					
[Note]	<ul style="list-style-type: none"> <li>• The waiting time for each macro execution will be <math>t \times 100</math> ms.</li> <li>• If this command is received during the macro definition, the macro definition stops and the macro which is being defined is cleared.</li> <li>• If that macro is not defined or r is 0, the command is invalid.</li> <li>• When the macro is running (<math>m=1</math>), the paper cannot be fed with the paper feed key.</li> </ul>					
[Reference]	<b>GS :</b>					

#### 57. **GS a n** Turns on/off the automatic status returning function (ASB)

[Format]	ASCII code	GS	a	n
	Hexadecimal code	1D	61	n

Decimal code            29        97        n

[Range]             $0 \leq n \leq 255$

[Description]    Turn on/off the automatic status returning function (**ASB**), use n to display the following status bar:

Bit	Turn off/on	Hexadecimal	Decimal	ASB Status
0	Turn off	00	0	Drawer is opened, and the connector Pin3 status function is closed.
	Turn on	01	1	When the crawler is opened, the status function of connector Pin3 will be opened.
1	Turn off	00	0	Turn off online or offline state
	Turn on	02	2	Turn on online or offline state
2	Turn off	00	0	Turn off the error state
	Turn on	04	4	Turn on the error state
3	Turn off	00	0	Turn off the paper sensor state
	Turn on	08	8	Paper sensor state printing
4-7	-	-	-	Not defined

First byte (printer information):

Bit	Turn off/on	Hexadecimal	Decimal	ASB Status
0, 1	Turn off	00	0	There is no definition. Fixed to 0.
2	Turn on	04	4	There is no definition. Fixed to 1.
3	Turn off	00	0	There is no definition. Fixed to 0.
4	Turn on	10	16	There is no definition. Fixed to 1.
5	Turn off	00	0	There is no definition. Fixed to 0.
6	Turn off	00	0	The paper is not fed through pressing the paper feed key.
	Turn on	40	64	The paper is being fed through pressing the paper feed key.
7	Turn off	00	0	There is no definition. Fixed to 0.

Second byte (printer information):

Bit	Turn off/on	Hexadecimal	Decimal	ASB Status
0-4	Turn off	00	0	There is no definition. Fixed to 0.
5	Turn off	00	0	No unrecoverable errors occurred.
	Turn on	20	32	An unrecoverable error occurred.
6	Turn off	00	0	No auto-recoverable errors occurred.
	Turn on	40	64	An auto-recoverable error occurred.
7	Turn off	00	0	There is no definition. Fixed to 0.

Third byte (paper sensor information):

Bit	Turn off/on	Hexadecimal	Decimal	ASB Status
0, 1	Turn off	00	0	There is no definition. Fixed to 0.
2, 3	Turn off	00	0	The printer has paper
	Turn on	0C	12	Printer is running out of paper.
4-7	Turn off	00	0	There is no definition. Fixed to 0.

Fourth byte (paper sensor information):

Bit	Turn off/on	Hexadecimal	Decimal	ASB Status
0, 3	-	-	-	There is no definition.
4-7	Turn off	00	0	There is no definition. Fixed to 0.

#### 58. GS f n Select the HRI to use typeface

[Format]	ASCII code	GS	f	n
	Hexadecimal code	1D	66	n
	Decimal code	29	102	n
[Range]	n = 0, 1, 48, 49			
[Description]	When printing bar-code, select a typeface for the HRI character and use n to select the typeface as follows:			

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

- [Note]
- The HRI characters are characters that comment on the contents of the bar-code.
  - The printing position of the HRI character is designated by the **GS H** command.

[Default] n = 0

[Reference] **GS H, GS k**

#### 59. GS h n Select the bar code height

[Format]	ASCII code	GS	h	n
	Hexadecimal code	1D	68	n
	Decimal code	29	104	n
[Range]	$1 \leq n \leq 255$			
[Description]	Select the bar code height. Bar code height is n points..			

[Default] n = 162

[Reference] GS k

**60. ① GS k m d1... dk NUL ② GS k m n d1... dn** Print bar-code

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

[Range] ①  $0 \leq m \leq 6$  (the value range of k and d is determined by the bar-code type)  
②  $65 \leq m \leq 73$  (the value range of k and d is determined by the bar-code type)

[Description] Select a bar-code type and print the bar-code.  
m is used to select the bar-code type as follows:

m		Bar code types	Number of characters	Character	Notes
①	0	UPC-A	$11 \leq k \leq 12$	0~9	$48 \leq d \leq 57$
	1	UPC-E	$11 \leq k \leq 12$	0~9	$48 \leq d \leq 57$
	2	JAN13 (EAN13)	$12 \leq k \leq 13$	0~9	$48 \leq d \leq 57$
	3	JAN8 (EAN8)	$7 \leq k \leq 8$	0~9	$48 \leq d \leq 57$
	4	CODE39	$1 \leq k \leq 255$	0~9, A~Z, SP, \$, %, +, -, ., / *(Start/end character)	$45 \leq d \leq 57$ , $65 \leq d \leq 90$ , $d = 32, 36, 37, 43$ , 45, 46, 47 $d = 42$ (Start/end character)
	5	ITF	$1 \leq k \leq 255$ (even number)	0~9	$48 \leq d \leq 57$
	6	CODABAR	$1 \leq k \leq 255$	0~9, A~D \$, +, -, ., /, : *(Start/end character)	$48 \leq d \leq 57$ , $65 \leq d \leq 68$ , $d = 36, 43, 45, 46$ , 47, 58
②	65	UPC-A	$11 \leq n \leq 12$	0~9	$48 \leq d \leq 57$
	66	UPC-E	$11 \leq n \leq 12$	0~9	$48 \leq d \leq 57$
	67	JAN13 (EAN13)	$12 \leq n \leq 13$	0~9	$48 \leq d \leq 57$
	68	JAN8 (EAN8)	$7 \leq n \leq 8$	0~9	$48 \leq d \leq 57$
	69	CODE39	$1 \leq n \leq 255$	0~9, A~Z, SP, \$, %, +, -, ., / *(Start/end character)	$45 \leq d \leq 57$ , $65 \leq d \leq 90$ , $d = 32, 36, 37, 43, 45$ , 46, 47 $d = 42$ (Start/end character)
	70	ITF	$1 \leq n \leq 255$ (even number)	0~9	$48 \leq d \leq 57$

	71	CODABAR	$1 \leq n \leq 255$	0~9, A~D \$, +, -, ., /, :	$48 \leq d \leq 57$ , $65 \leq d \leq 68$ , $d = 36, 43, 45, 46$ , 47, 58
	72	CODE93	$1 \leq n \leq 255$	NUL~SP(7FH)	$0 \leq d \leq 127$
	73	CODE128	$2 \leq n \leq 255$	NUL~SP(7FH)	$0 \leq d \leq 127$

[Note①]

- The command ends with NUL in this format.
- When UPC-A or UPC-E is selected, the remaining characters are treated as normal characters after the printer receives 12-byte bar-code data.
- When the JAN13(EAN13) type is selected, the remaining characters are treated as normal characters after the printer receives 13-byte bar-code data.
- When the JAN8 (EAN8) type is selected, the remaining characters are treated as normal characters after the printer receives 8-byte bar-code data.
- The number of ITF code data must be the even number. If you enter an odd number of bar-code data, the last data is ignored.

[Note②]

- n is used to indicate the number of bar code data, and the printer processes the next n bytes of data as bar-code data.
- If n is outside the specified range, the printer does not process this command, and the subsequent data is processed as normal data.

[Note (the standard mode)]

- If the bar-code data d is out of the specified range, the command is invalid.
- If the bar-code laterally exceeds the printing area, it is invalid.
- This command, regardless of the line height set by the **ESC 2** or **ESC 3** commands, is the same as the-bar code height set.
- This command is valid only if there is no data in the printing buffer. If there is data in the print buffer, the command is ignored.
- After printing the bar-code, set the printing position at the beginning of the line.
- Print mode settings (such as the bold, double print, underline, character size, reverse, and characters rotated 90°clockwise) do not affect this command, but inverted mode has an effect on bar-code printing.

[Notes (The page mode)]

- This command will only generate bar-code graphics to the print buffer, but does not print. Move the print position to the right of the bar-code after processing the bar-code data.
- If d is beyond the specified range, the command is ignored.
- If the bar-code width exceeds the print area, the command is ignored.

When CODE128(m=73) is selected:

- Refer to Appendix A, CODE 128 for the relevant information and character set.
- When using CODE 128, code according to the following regulations:
  - ① The character set (one of CODE A, CODE B, and CODE C) must be selected before bar-code data.
  - ② Selecting the character set is done by sending the character "{" which is in combination with another character; the ASCII character "{" is done by sending the character "{" twice in succession.

Special character	Send data		
	ASCII code	Hexadecimal code	Decimal code
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

[Instance] For example, print "No. 123456"

In this example, the printer will firstly print the "No." with CODE B and then the remaining numbers with CODE C:



- If the character set is not selected at the top of the bar-code data, the printer stops the processing of this command and treats the remaining data as normal data.
- If "{" and the character immediately following it are not the combination which is designated above, the printer stops the processing of this command and processes the remaining data as normal data.
- If the characters which is received by the printer are not bar-code character set data, the printer stops the processing of this command and processes the remaining data as normal data.
- When the printer prints the HRI characters, the shift characters and the character set selection data are not printed.
- The HRI characters of function characters are not printed.
- The HRI characters of the control characters (<00>H to <1F>H and <7F>H) are not printed;

<Other> Be sure to ensure the bar code left and right clearance. The gap varies based on the bar-code type.

[Reference] **GS H, GS f, GS h, GS w**

#### 61. **GS r n** Return state

[Format]	ASCII code	GS	r	n
	Hexadecimal code	1D	72	n
	Decimal code	29	114	n

[Range] n = 1, 2, 49, 50

[Description] Returns the state which is specified by the value of n:

n	Function
1, 49	Return paper sensor state
2, 50	Return to Cash Drawer state

- [Note]
- This command is only valid for the serial printers.
  - The command is not executed until the data before the command has been processed in the receive buffer, so there is a time lag between sending the command and also receiving the return state.
  - The return state byte bits correspond as follows:  
the paper sensor state (n=1, 49):

Bit	0/1	Hexadecimal code	Decimal code	Status
0, 1	0	00	0	Paper exhaustion sensor, papers are there
	1	03	3	Paper exhaustion sensor, papers run out
2, 3	0	00	0	Paper out sensor, papers are there
	1	0c	12	Paper out sensor, papers run out
4	0	00	0	No, fixed to 0
5, 6		---	---	Undefined
7	0	00	0	No, fixed to 0

Cash Drawer state (n=2, 50):

Bit	0/1	Hexadecimal code	Decimal code	Status
0	0	00	0	There is the Cash Drawer to be open
	1	01	1	There is no Cash Drawer to be open
1-3		---	---	Undefined
4	0	00	0	No, fixed to 0
5, 6		---	---	Undefined
7	0	00	0	No, fixed to 0

[Reference] **DLE EOT, GS a**

## 62. GS v 0 m xL xH yL yH d1...dk Print raster bitmap

[Format]	ASCII code	GS	v	0	m xL xH yL yH d1...dk
	Hexadecimal code	1D	76	30	m xL xH yL yH d1...dk
	Decimal code	29	118	48	m xL xH yL yH d1...dk

[Range]  $0 \leq m \leq 3, 48 \leq m \leq 51$

$0 \leq xL \leq 255$

$0 \leq xH \leq 255$

$0 \leq yL \leq 255$

$0 \leq d \leq 255$

$k = (xL + xH \times 256) \times (yL + yH \times 256) (k \neq 0)$

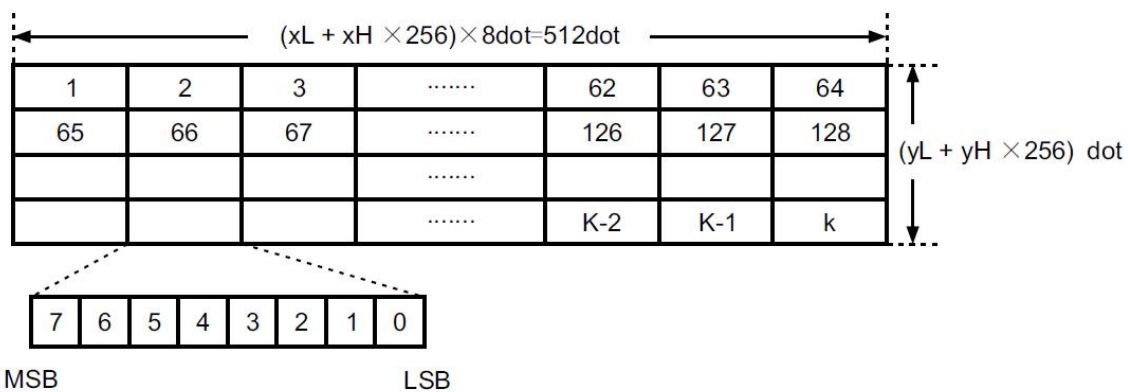
[Description] Print raster bitmap with raster bitmap mode selected by m value:

m	Mode	Longitudinal resolution (DPI)	Lateral resolution (DPI)
0, 48	Normal	200	200
1, 49	Double width	200	100
2, 50	Double height	100	200
3, 51	Double width and double height	100	100



- xL, xH are the number of bytes of horizontal bitmap ( $xL+xH \times 256$ )
  - yL, yH are the number of bitmap points in the vertical direction ( $yL+yH \times 256$ )
- [Note]
- In the standard mode, this command is valid only if there is no data in the printer buffer.
  - Print modes such as character enlargement, bold, double Print, inverted print, underline, black and white are not valid for this command.
  - Portions of the bitmap that are beyond the printing area are not printed.
  - **ESC a** (select alignment mode) is valid for the raster bitmaps.
  - During macro definition, the command stops the macro definition and then executes the command. This command is not part of the macro definition.
  - d represents bitmap data. The corresponding bit of each byte is 1 to print the point and 0 to not print the point.

[Instances] When  $xL + xH \times 256 = 64$



### 63. GSwn Set the bar-code width

[Format]	ASCII code	GS	w	n
	Hexadecimal code	1D	77	n
	Decimal code	29	119	n

[Range]  $2 \leq n \leq 6$

[Description] Set bar-code lateral module width

The lateral module width of the bar-code is specified by n:

n	Single base module width (mm)	Dual base module width	
		Narrow base module (mm)	Wide basic module (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

- The bar-code of single basic module is as follows:  
UPC-A, UPC-E, JAN13 (EAN13), JAN8 (EAN8), CODE93, CODE128
- Double basic module bar codes are as follows:  
CODE39, ITF, CODABAR

[Default] n = 3

[Reference] **GS k**

## Chinese character control command

### 64. FS! N Set the Chinese character mode

[Format]	ASCII code	FS	!	n
	Hexadecimal code	1C	21	n
	Decimal code	28	33	n

[Range]  $0 \leq n \leq 255$

[Description] The Print mode of Chinese characters is set with the value of n as follows:

Bit	0/1	Hexadecimal code	Decimal code	Function
0, 1		---	---	Undefined
2	0	00	0	Cancel double width
	1	04	4	Select double width
3	0	00	0	Cancel double height
	1	08	8	Select double height
4-6		--	--	Undefined
7	0	00	0	Cancel underline
	1	80	128	Select underline

- [Note]
- When the double width and double height modes are set at the same time, the characters are enlarged twice in both lateral and longitudinal directions (including the left-right spacing).
  - The printer can underline all characters, including left-right spacing. However, spaces caused by HT commands (lateral ticks) cannot be underlined, nor characters rotated 90 degrees clockwise can be underlined.
  - The underline line width is set by the FS-regardless of the character size.
  - When characters in a row differ in height, all characters in the row will be underlined.
  - **FS W** or **GS!** can be used. Bold the characters, the last command is valid.
  - You can also use FS-select or cancel the underline mode and the last command is valid.

[Default] n = 0

[Reference] **FS - , FS W, GS !**

### 65. FS& Select the Chinese character mode

[Format]	ASCII code	FS	&
	Hexadecimal code	1C	26
	Decimal code	28	38

[Description] Select the Chinese character mode

- [Note]
- When the Chinese character mode is selected, the printer judges whether the character is the Chinese character internal code, if the character is the Chinese character internal code, first processing the first byte, and then judging whether the second byte is the Chinese character internal code.
  - After the printer is electrified, the Chinese character mode is automatically selected;

[Reference] **FS.**

### 66. FS-n Select/cancel Chinese underline mode

[Format]	ASCII code	FS	-	n
	Hexadecimal code	1C	2D	n

Decimal code            28    45        n

[Range]      $0 \leq n \leq 2, 48 \leq n \leq 50$

[Description]        According to the value of n, select/cancel underline of the Chinese characters

n	Function
0, 48	Remove Chinese characters from underlining
1, 49	Select Chinese character underline (1 point width)
2, 50	Select Chinese character underline (2 points width)

[Note]     • The printer can underline all characters, including the left-right spacing. However, spaces caused by HT commands (lateral ticks) cannot be underlined, nor characters rotated 90 degrees clockwise.  
 • After canceling the underlining mode, underline printing is no longer performed, but the originally set underline line weight does not change. The default underline line weight is 1 point.  
 • Even if the character size is changed, the set underline line weight does not change.  
 • With FS! You can also select or cancel the underlined mode and the last command is active.

[Default]            n = 0

[Reference]        **FS !**

#### 67. FS. Cancel the Chinese character mode

[Format]    ASCII code            FS    .  
               Hexadecimal code    1C    2E  
               Decimal code        28    46

[Description]    Cancel the Chinese character mode

[Note]     • When the Chinese character mode is canceled, all characters are treated as ASCII characters, one byte at a time.  
 • The Chinese character mode is automatically selected on power-up.

[Reference]    **FS &**

#### 68. FS 2 c1 c2 d1... dk Define the user-defined Chinese characters

[Format]        ASCII code            FS        2            c1        c2        d1...dk  
                   Hexadecimal code    1C        32            c1        c2        d1...dk  
                   Decimal code        28        50            c1        c2        d1...dk

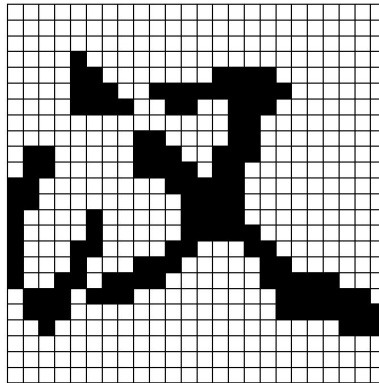
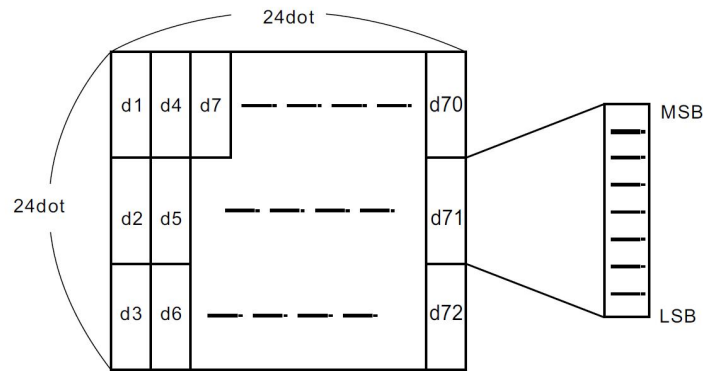
[Range]        c1 and c2 represent the character codes which define the characters  
                   c1 = FEH  
                    $A1H \leq c2 \leq FEH$   
                    $0 \leq d \leq 255$   
                   k = 72

[Description]    Define Chinese characters designated by c1 and c2

[Note]     • c1 and c2 represent user-defined Chinese character codes, c1 designates the first byte, and c2 designates the second byte.

[Default]        • d stands for data. 1 represents to print a point, 0 means not to print

The relationship between user-defined Chinese font and data is shown in the following figures:



D1=00H, D4=00H, D7=00H, D10=00H .....  
D2=1FH, D5=78H, D8=60H, D11=00H .....  
D3=C0H, D6=30H, D9=38H, D12=70H .....

#### 69. FS S n1 n2 sets the left and right spacing of Chinese characters

[Format]	ASCII code	FS	S	n1	n2
	Hexadecimal code	1C	53	n1	n2
	Decimal code	28	83	n1	n2
[Range]	$0 \leq n1 \leq 255$ $0 \leq n2 \leq 255$				
[Description]	<p>The left and right spacing of the Chinese characters are set to n1 and n2 respectively.</p> <ul style="list-style-type: none"> <li>When the printer supports the <b>GS P</b> command, the left spacing is [n1×lateral or longitudinal movement units] inches, and the right spacing is [n2×lateral or longitudinal movement units] inches.</li> </ul>				
[Note]	<ul style="list-style-type: none"> <li>When the double width mode is set, the spacing between the left and right is doubled.</li> <li>The movement unit is set by the <b>GS P</b> command. Even if the units of lateral and longitudinal movement are changed by <b>GS P</b>, the originally set character pitch does not change.</li> <li>In the standard mode, move units laterally.</li> <li>In the page mode, choose whether to move units laterally or longitudinally, based on the start position of the print area: <ol style="list-style-type: none"> <li>When the start position is in the upper left corner or lower right corner of the printing area, move the unit laterally.</li> <li>When the start position is in the upper right corner or lower left corner of the printing area, move the unit laterally.</li> <li>The maximum right spacing of Chinese characters is about 36mm. If it exceeds this value, the maximum value will be taken.</li> </ol> </li> </ul>				

[Default] n1 = 0, n2 = 0

[Reference] **GS P**

**70. FS W n** Select/cancel double height and multiple width of Chinese characters

---

[Format]	ASCII code	FS	W	n
	Hexadecimal code	1C	57	n
	Decimal code	28	87	n

[Range]  $0 \leq n \leq 255$

[Description] Select or cancel the double height and double width mode of Chinese characters.

- When the lowest bit of n is 0, the double height and the double width mode of the Chinese character is canceled.
- When the lowest bit of n is 1, the Chinese character double height and double width mode is selected.

[Note]

- Only the least significant bit of n is valid.
- In the double-height and double-width mode mode, the size of Chinese characters is printed in the same way as when the double-width and double-height modes are selected.
- After the double height and double width mode of Chinese characters is canceled, the Chinese characters printed out later are of the normal size.
- When characters in a line are different in height, all characters in the line are underlined.
- You can also use **FS!** Or **GS!** Command (select double height and double width mode) to select or cancel the double height and the double width mode of Chinese characters. The last received command is valid.

[Default] n = 0 [Reference]

**FS!, GS !**

**71. FS W n** Select/cancel double height and multiple width of Chinese characters

---

[Format]	ASCII code	FS	W	n
	Hexadecimal code	1C	57	n
	Decimal code	28	87	n

[Range]  $0 \leq n \leq 255$

[Description] Select or cancel the double height and double width mode of Chinese characters.

- When the lowest bit of n is 0, the double height and the double width mode of the Chinese character is canceled.
- When the lowest bit of n is 1, the Chinese character double height and double width mode is selected.

## Printer prompt function commands

**72 ESC B n t** The prompt of the printer printing single beep (applicable to **POS-80XX** series)

---

[Format]	ASCII code	ESC	B	n	t
	Hexadecimal code	1B	42	n	t
	Decimal code	27	66	n	t

[Range]  $1 \leq n \leq 9, 1 \leq t \leq 9$

[Description] The printer prints a beep.

- n is the number of buzzer sounds.
- t is the buzzer sounding time (t×50) milliseconds

**73. Single printing beep prompt and flashing warning light of ESC C m t n** printer (applicable to **POS-80XX** series)

---

[Format]	ASCII code	ESC	C	m	t	n
	Hexadecimal code	1B	43	m	t	n
	Decimal code	27	67	m	t	n
[Range]	1<=m<=20, 1<=t<=20, 0<=n<=3, The printer will print the beep and the warning light will flash.					
[Description]	• m: 1<=m<=20, it refers to the times of flashing of alarm lamp or buzzer.					
	• t: 1<=t<=20, it refers to the interval time between flashing of alarm lamp and buzzer is t*50 ms or (t×50) ms.					
	• When n=0, the buzzer does not sound and the alarm lamp does not flash;					
	When n=1, the buzzer sounds;					
	When n=2, the alarm lamp flashes;					
	When n=3, the buzzer sounds and the alarm lamp flashes at the same time;					

#### 74. ESC I Full-cut paper

[Format]	ASCII code	ESC i
	Hexadecimal code	1B 69
	Decimal code	27 105
[Description]	Full paper cutting of the printer	
[Note]	• The paper cutting mode is limited by the structure of the cutter, and the specific paper cutting mode is required in accordance with the structure.	
	• GS V instruction paper cutting is recommended.	

#### 75. ESC m partial cut paper

[Format]	ASCII code	ESC i
	Hexadecimal code	1B 6D
	Decimal code	27 105
[Description]	Partial cut after the printer is complete	
[Note]	• The paper cutting mode is limited by the structure of the cutter, and the specific paper cutting mode is required in accordance with the structure.	
	• GS V instruction paper cutting is recommended.	

#### 76. ESC u Inquire Cash Drawer signal

[Format]	ASCII code	ESC u n
	Hexadecimal code	1B 75 n
	Decimal code	27 117 n
[Range]	n=0, 48	
[Description]	Transfer Cash Drawer state in one byte of data	

Return value (transfer value in hexadecimal as an example)	Cash Drawer state
00	The Cash Drawer is open
01	The Cash Drawer is closed

#### 77. ESC v Inquire the printer state information

[Format]	ASCII code	ESC v
	Hexadecimal code	1B 76
	Decimal code	27 118
[Description]	Inquire the printer state information	
[Note]	• The inquiry of printer status information is indicated under the port of the network port 4000, and the inquiry of the printer paper shortage state will be indicated under the port of the network	

port 9100 and other interfaces.

The printer status information of 4 bytes is returned under the port of the network port 4000, and the information of 1 byte is returned under the port of the network port 9100 and other interfaces to indicate the paper shortage state of the printer.

Corresponding table of USB return value of network port 9100 and serial port:

Port 4000 ends:

Return value (transfer value in hexadecimal as an example)	Printer out of paper state
00	Printer is not running out of paper
0C	Printer is running out of paper

1st byte:

Bit	Binary system	Status	Hexadecimal	Decimal
0	0	Fixed	00	0
1	0	Fixed	00	0
2	0	The Cash Drawer signal is low	00	0
	1	The Cash Drawer signal is high	04	4
3	0	Printer online	00	0
	1	Printer offline	08	8
4	1	Fixed	00	0
5	0	Reversing cover is closed	00	0
	1	Reversing cover is open	20	32
6	0	The paper is not fed through the paper feed key	00	0
	1	Feed the paper through the paper feed key	40	64
7	0	Fixed	00	0

2nd byte:

Bit	Binary system	Status	Hexadecimal	Decimal
0	0	Fixed	00	0
1	0	Fixed	00	0
2	0	Fixed	00	0
3	0	Cutter is normal	00	0
	1	Cutter occurs error	08	8
4	0	Fixed	00	0
5	0	Non-recoverable error does not occurred	00	0
	1	Non-recoverable error occurred	20	32
6	0	Recoverable error does not occurred	00	0
	1	Recoverable error occurred	40	64
7	0	Fixed	00	0

3rd byte:

Bit	Binary system	Status	Hexadecimal	Decimal
0, 1	00	Paper exhaustion sensor: there are still papers	00	0

	11	Paper exhaustion sensor: papers run out	03	3
2, 3	00	Paper out sensor: there are still papers	00	0
	11	Paper out sensor: papers run out	0C	12
4	0	Fixed	00	0
5, 6	-	Reserved	-	-
7	0	Fixed	00	0

4th byte:

Bit	Binary system	Status	Hexadecimal	Decimal
0	0	Fixed	00	0
1	0	Fixed	00	0
2	0	Fixed	00	0
3	0	Fixed	00	0
4	0	Fixed	00	0
5, 6	-	Reserved	-	-
7	0	Fixed	00	0

Note: There is no paper exhaustion sensor, so the 3rd byte returns only the paper out sensor information.

Attached 4000 port return value verification table:

Instruction	Testing conditions	Return value (HEX)
1B 76	Normal	14 00 00 00
	Uncover	3C 00 00 00
	Paper feed	5C 00 00 00
	Out of paper	1C 00 0C 00
	Open a Cash Drawer	10 00 00 00
	Over temperature	1C 40 00 00
	Cutter occurs error	14 28 00 00

## 78. GS r transmission states

[Format]      ASCII code      GS r n  
                   Hexadecimal code    1D 72 n  
                   Decimal code        29 114 n

[Range]        n = 1, 2, 49, 50

[Description]   Returns the state which is specified by the value of n:

n	Function
1, 49	Return paper sensor state
2, 50	Return to Cash Drawer state

- [Note]
- This command is not valid for the parallel port printers only.
  - The command is not executed until the data before the command has been processed in the receive buffer, so there is a time lag between sending the command and also receiving the return state.
  - The correspondence of each bit of the return status byte is as follows:

Paper sensor states (n=1, 49):

Bit	0/1	Hexadecimal code	Decimal code	Status
-----	-----	------------------	--------------	--------



0, 1	0	00	0	Paper exhaustion sensor, papers are there
	1	03	3	Paper exhaustion sensor, papers run out
2, 3	0	00	0	Paper out sensor, papers are there
	1	0C	12	Paper out sensor, papers run out
4	0	00	0	No, fixed to 0
5, 6		---	---	Undefined
7	0	00	0	No, fixed to 0

Note: Bits 2 and 3: When the paper out sensor detects the print paper out, the printer goes offline and the command does not execute. Bits 2 and 3 do not convey an out-of-paper condition.

Cash Drawer state (n=2, 50):

Bit	0/1	Hexadecimal code	Decimal code	Status
0	0	00	0	There is the Cash Drawer to be open
	1	01	1	There is no Cash Drawer to be open
1-3		---	---	Undefined
4	0	00	0	No, fixed to 0
5, 6		---	---	Undefined
7	0	00	0	No, fixed to 0

The return value verification table is attached:

Instruction	n value	Testing conditions	Return value (HEX)
GS r	1, 49	Normal	00
		Out of paper	No returning value
	2, 50	There is the Cash Drawer to be open	00
		There is no Cash Drawer to be open	01

#### 79. GS (k <Function 065> PDF417: Set the number of columns in the data area

[Format]	ASCII code	GS ( k pL pH cn fn n
	Hexadecimal code	1D 28 6B 03 00 30 41 n
	Decimal code	29 40 107 3 0 48 65 n
[Description]	Set the number of columns in the PDF417 data area	
	When n=0, specify the automatic processing	
	When n!=0, set the data area to n columns	
[Range]	(pL+pH×256)=3	
	cn=48	
	fn=65	
	n=0-30	
[Default]	n = 0	
[Note]	The specific value of n should be set according to the paper width.	

#### 80. GS (k <Function 066> PDF417: set the number of lines

[Format]	ASCII code	GS ( k pL pH cn fn n
	Hexadecimal code	1D 28 6B 03 00 30 42 n
	Decimal code	29 40 107 3 0 48 66 n
[Description]	Set the number of lines in PDF417	
	When n=0, specify the automatic processing	

When  $n \neq 0$ , set the number of rows to  $n$

[Range] (pL+pH×256)=3  
cn=48  
fn=66  
n=0, 3-90

[Default] n = 0

[Note] The specific value of  $n$  should be set according to the paper width.

### 81. GS (k <Function 067> PDF417: Set the width of the module

---

[Format] ASCII code GS ( k pL pH cn fn n  
Hexadecimal code 1D 28 6B 03 00 30 43 n  
Decimal code 29 40 107 3 0 48 67 n

[Description] Set the module width of PDF417 in point unit

[Range] (pL+pH×256)=3  
cn=48  
fn=67  
n=2-8

[Default] n = 3

[Note] The specific value of  $n$  should be set according to the paper width.

### 82. GS (k <Function 068> PDF417: Set the height of the module

---

[Format] ASCII code GS ( k pL pH cn fn n  
Hexadecimal code 1D 28 6B 03 00 30 44 n  
Decimal code 29 40 107 3 0 48 68 n

[Description] Set module height of PDF417=module width× $n$

[Range] (pL+pH×256)=3  
cn=48  
fn=68  
n=2-8

[Default] n = 3

[Note] The specific value of  $n$  should be set according to the paper width.

### 83. GS (k <Function 069> PDF417: Set error correction level

---

[Format] ASCII code GS ( k pL pH cn fn m n  
Hexadecimal code 1D 28 6B 04 00 30 45 m n  
Decimal code 29 40 107 4 0 48 69 m n

[Description] Setting the error correction level of PDF417

m	Function
48	Error correction level is set by level
49	The error correction level is set by the ratio. Ratio= $n \times 10\%$

[Range] (pL+pH×256)=4  
cn=48  
fn=69  
m=48, n=48-56  
m=49, n=1-40

[Default] m=49, n=1

---

**84. GS (k <Function 070> PDF417: Select options**

---

[Format]        ASCII code            GS ( k pL pH cn fn n  
                  Hexadecimal code        1D 28 6B 03 00 30 46 n  
                  Decimal code            29 40 107 3 0 48 70 n

[Description]    Select options for PDF417

m	Function
0	Select standard PDF417
1	Select truncate PDF417

[Range]        (pL+pH×256)=3  
                  cn=48  
                  fn=70  
                  m=0, 1

[Default]       m=0

---

**85. GS (k <Function 080> PDF417: Storing data in the storage area**

---

[Format]        ASCII code            GS ( k pL pH cn fn m d1...dk  
                  Hexadecimal code        1D 28 6B pL pH 30 50 30 d1...dk  
                  Decimal code            29 40 107 pL pH 48 80 48 d1...dk

[Description]    Store PDF417 data in the storage area (d1.. . dk)

[Range]        (pL+pH×256)=4-65535  
                  cn=48  
                  fn=80  
                  m=48  
                  d=0-255  
                  k=(pL+pH×256)-3

---

**87. GS (k <Function 081> PDF417: Print data in the storage area**

---

[Format]        ASCII code            GS ( k pL pH cn fn m  
                  Hexadecimal code        1D 28 6B 03 00 30 51 30  
                  Decimal code            29 40 107 3 0 48 81 48

[Description]    Print data in the storage area

[Range]        (pL+pH×256)=3  
                  cn=48  
                  fn=81  
                  m=48

---

**88. GS (k <Function 167> QR Code: set the module size**

---

[Format]        ASCII code            GS ( k pL pH cn fn n  
                  Hexadecimal code        1D 28 6B 03 00 31 43 n  
                  Decimal code            29 40 107 3 0 49 67 n

[Description]    Set the dimensions of QR Code (in point)

[Range]        (pL+pH×256)=3  
                  cn=49  
                  fn=67  
                  n: 1-16

[Default] n=3

**89. GS (k <Function 169> QR Code: Set error correction level**

[Format] ASCII code GS ( k pL pH cn fn n  
Hexadecimal code 1D 28 6B 03 00 31 45 n  
Decimal code 29 40 107 3 0 49 69 n  
[Description] Setting the error correction level of QR Code

n	Function	Error correction capability%
48	Select error correction level L	7
49	Select error correction level M	15
50	Select error correction level Q	25
51	Select error correction level H	30

[Range] (pL+pH×256)=3  
cn=49  
fn=69  
n=48-51

[Default] n=48

**90. GS (k <Function 180> QR Code: store data in the storage area**

[Format] ASCII code GS ( k pL pH cn fn m d1...dk  
Hexadecimal code 1D 28 6B pL pH 31 50 30 d1...dk  
Decimal code 29 40 107 pL pH 49 80 48 d1...dk  
[Description] Storing QR code data in the data storage area  
[Range] cn=49  
fn=80  
m=48  
d=0-255  
k=(pL+pH×256)-3

Data type	Specify characters
Digital mode data	“0“-”9“
Alphabetic pattern data	“0“-”9 “, ”A“-”Z“, SP, \$, %, *, +, -, ., /
KANJI Mode data	Japanese
8-bit byte mode data	00h-FFh

**91. GS ( k <Function 181> QR Code: Print data in the storage area**

[Format] ASCII code GS ( k pL pH cn fn m  
Hexadecimal code 1D 28 6B 03 00 31 51 m  
Decimal code 29 40 107 3 0 49 81 m  
[Description] Encode and print QR code data  
[Range] (pL+pH×256)=3  
cn=49  
fn=81

m=48

**92. GS (k <Function 167> QR Code: set the module size**

---

[Format]	ASCII code	GS ( k m fn n
	Hexadecimal code	1D 28 6B m fn n
	Decimal code	29 40 107 m fn n
[Description]	Set the dimensions of QR Code (in point)	
[Range]	m=0x30	
	fn=0x67	
	n: 1-16	
[Default]	n=3	

**93. GS (k <Function 169> QR Code: Set error correction level**

---

[Format]	ASCII code	GS ( k m fn n
	Hexadecimal code	1D 28 6B m fn n
	Decimal code	29 40 107 m fn n
[Description]	Setting the error correction level of QR Code	

n	Function	Error correction capability%
48	Select error correction level L	7
49	Select error correction level M	15
50	Select error correction level Q	25
51	Select error correction level H	30

[Range]	m=0x30	
	fn=0x69	
	n: 48-51	
[Default]	n=48	

**94. GS (k <Function 180> QR Code: store data in the storage area**

---

[Format]	ASCII code	GS ( k m fn dL dH d1...dk
	Hexadecimal code	1D 28 6B m fn dL dH d1...dk
	Decimal code	29 40 107 m fn dL dH d1...dk
[Description]	Storing QR code data in the data storage area	
[Range]	fn=0x80	
	m=0x30	
	d=0-255	
	k=dL+dH×256	

Data type	Specify characters
Digital mode data	“0“-”9“
Alphabetic pattern data	“0“-”9“, ”A“-”Z“, SP, \$, %, *, +, -, ., /
KANJI Mode data	Japanese
8-bit byte mode data	00h-FFh

#### 95. GS ( k <Function 181> QR Code: Print data in the storage area

[Format]	ASCII code	GS ( k m fn
	Hexadecimal code	1D 28 6B m fn
	Decimal code	29 40 107 m fn
[Description]	Encode and print QR code data	
[Range]	fn=0x81	
	m=0x30	

#### 96. FS C Enable/prohibit Japanese system

[Format]	ASCII code	FS C n
	Hexadecimal code	1C 43 n
	Decimal code	28 67 n
[Range]	N=0, 48: Prohibit the Japanese system	
	N=1, 49: Enable Japanese system	
[Description]	Set Chinese character language as Japanese	
[Note]	The prerequisite for enabling Japanese is to set the Chinese language as Japanese.	

#### 97. GS FF will feed the black label printing paper to the printing start position

[Format]	ASCII code	GS FF
	Hexadecimal code	1D 0C
	Decimal code	29 12
[Description]	Feed the marked print paper to the printing start position.	
[Note]	<ul style="list-style-type: none"> <li>• This command is only activated when the black mark function is turned on.</li> <li>• This command sets the next printing position at the beginning of a line.</li> <li>• Even if the command is executed at the print start position of the marked printing paper, the printer does not feed the print to the next print start position.</li> <li>• This command is required when using the black mark function</li> </ul>	

#### 98. GS (F set the black mark adjustment value

[Format]	ASCII code	GS ( F pL pH a m nL nH
	Hexadecimal code	1D 28 46 pL pH a m nL nH
	Decimal code	29 40 70 pL pH a m nL nH
[Range]	(pL+(pH×256))=4 i. e. pL=4, pH=0	
	$1 \leq a \leq 2$	
	M=0, 48 or 1, 49	
	$0 \leq (nL + nH \times 256) \leq 1700$	
	$0 \leq nL \leq 255, 0 \leq nH \leq 255$	
[Description]	This command is valid only when BM sensors are enabled.	
	<ul style="list-style-type: none"> <li>• Set the printer operation adjustment value which is designated by parameter a.</li> <li>• pL and pH specify parameters, for example, the number of a is (p L+(p H×256)) bytes.</li> </ul>	
	• a Used to specify the settings of the start printing position and the cutting position.	

a	Function
1	Set the setting of the start printing position.
2	Set the setting for the start cutting position.

- m Specifies the direction of adjustment.

M	Function
0, 48	Specify the direction in which the paper is fed forward.
1, 49	Specify the direction of reverse feed.

- nL and nH are the start printing position or the cutting position that advances [ (nL+nH×256)×0.125 mm] after the black mark is detected.

[Note] • The printing start position adjustment value (a=1) is affected by the following command:

FF, GS FF

- The trim position adjustment value (a=2) is affected by the following command:

GS V m n

- When the command is received from the host, it is first stored in a receive buffer, and then and then it is carried out during the execution of other ordinary commands. Therefore, the printer may delay execution of the command after it is received, based on the status of the receive buffer.
- For the setting of m, the reverse paper feed function is temporarily turned off, i. e. the instructions for filtering the reverse paper feed.
- The setting value of printing start position should be greater than or equal to the setting value of paper cutting position. If it is less than the setting value, the setting value of cutter position should be taken.

[Default] All adjustment values are set to "0"(when the BM sensor detects BM, the corresponding positions of printing head and cutter are respectively the printing start position and the paper cutting position)

## 99. ESC q Sets the pulse to drive the cashbox when printing

[Format]	ASCII code	ESC q m t1 t2
	Hexadecimal code	1B 71 m t1 t2
	Decimal code	27 113 m t1 t2

[Range] m=[0, 1, 48, 49] 0 ≤ t1 ≤ 255 0 ≤ t2 ≤ 255 t1≤t2

[Description] Outputs the cash drawer opening pulse set by t1 and t2 to the pin which is designated by m:

m	Connecting pin
0, 48	Pin 2 of cash drawer socket
1, 49	Pin 5 of cash drawer socket

[Note] • The high-level time of the cash drawer opening pulse is t1 ms, and the flat time of the low point is t2 ms.

- If t2 < t1, then t2=t1.

## 100. The Cash Drawer pulse generated when ESC r drives printing

[Format]	ASCII code	ESC r
	Hexadecimal code	1B 72
	Decimal code	27 114

[Description] Sending the command generates a Cash Drawer pulse that has been set.

- [Note]
- This command is used in conjunction with the ESC q to set and then generate a Cash Drawer pulse.
  - This command sets one Cash Drawer pulse to only generate one Cash Drawer pulse. If Cash Drawer pulse needs to be generated, please reset the Cash Drawer pulse.

101. **GS))** In the hexadecimal mode, execute hexadecimal printing data

[Format]	ASCII code	GS ) )
	Hexadecimal code	1D 29 29
	Decimal code	29 41 41
[Description]	In the hexadecimal mode, send this command to print the data after hexadecimal conversion	

102. **GS I** Transfer printer ID

[Format]	ASCII code	GS I n
	Hexadecimal code	1D 49 n
	Decimal code	29 73 n
[Range]	n: The difference depends on the printer	
[Default]	No	
[Description]	Transfer printer ID or printer information	

Printer ID:

n	Printer ID	Specific content
1, 49	Printer model ID	Printer model ID
2, 50	Type ID	Printer type
3, 51	Version ID	Firmware version

\*Printer information A:

n	Printer information A	Specific content
33	Type information	Supported functions
35, 36, 96, 110	(See model specific information)	(See model specific information)

\*Printer information B:

n	Printer information B	Specific content
65	Firmware version	Firmware version
66	Name of producer	"EPSON"
67	Model name	Model name
68	Serial number	Serial number of the printer
69	Language and typeface used by per country	Japan: "KANJI JAPANESE"
		Simplified Chinese mode:"CHINA GB2312" or "CHINA GB18030"
		Traditional Chinese mode:"TAIWAN BIG-5"
		Korea: "KOREA C-5601C"
		South Asia:"THAI 1 PASS"
112	See model specific information	See model specific information

- [Note]
- When using this command, please observe the following rules:
- When the host sends function data, the next data is sent after receiving the corresponding ID from the printer.
  - Using a serial interface printer, be sure to use this function when the host can receive data.
  - The parallel interface printer is used for filtering without carrying out the instruction.



[Printer ID considerations]

- Each printer ID consists of 1 byte.
- Printer models (n=1, 49) vary by printer model.
- The ID type (n=2, 50) is as follows:

Bit	Binary system	Function	Hexadecimal	Decimal
0	0	Multi-byte code characters are not supported	00	0
	1	Supports multi-byte code characters	01	1
1	0	Not installed the automatic cutter	00	0
	1	Install the automatic cutter	02	2
2	0	DM-D is not connected	00	0
	1	DM-D is connected	04	4
3	-	Reserved	-	-
4	0	Fixed	00	0
5	-	Reserved	-	-
6	0	Fixed	00	0
7	0	Fixed	00	0

- There is a one-to-one correspondence between the version number (n=3, 51) and the firmware version. The details variation depends on the printer model.
- The printer ID differs from other transmitted data in the 4th and 7th bits. When the data sent by the printer GS I is "0xx0xxxx"(x=0, 1), the printer processes the data as the printer ID.

[Printer information A precautions]

- The printer information A is composed of [Header-NULL] as shown in the following table:

Send data	Hexadecimal	Decimal	Bytes
Header	3Dh	61	1 byte
Identifier (*1)	21h, 23h, 24h, 0h, or 6Eh	33, 35, 36, 96, or 110	1 byte
Printer nformation A	Depending on printer model	Depending on printer model	0-80 byte
NUL	00h		1 byte

- (\*1) The identifier is equal to the parameter n of the command.
- Type information (n=33) is 1 byte of [the first byte] , 2 bytes of [the first byte] and [the second byte] , or 3 bytes of [the first byte] to [the third byte] , depending on the model.

<the first byte>

Bit	Binary system	Function	Hexadecimal	Decimal
0	0	Multi-byte code characters are not supported	00	0
	1	Supports multi-byte code characters	01	1
1	0	Not installed the automatic cutter	00	0
	1	Install the automatic cutter	02	2
2	0	DM-D is not connected	00	0
	1	DM-D is connected	04	4
3-5	-	Reserved	-	-
6	1	Fixed	40	64
7	0	Fixed	00	0

<the second byte>

Bit	Binary system	Function	Hexadecimal	Decimal
0-5	-	Reserved	-	-
6	1	Fixed	40	64
7	0	Fixed	00	00

<the third byte>

Bit	Binary system	Function	Hexadecimal	Decimal
0	0	No stripping function	00	0
	1	By the stripping function	01	1
1-5	-	Reserved	-	-
6	1	Fixed	40	64
7	0	Fixed	00	0

- When communicating with the printer, using the XON/XOFF control, the XOFF code may interrupt the "Header to NUL" data string.
- The printer information A may be distinguished by a header of block data from other transmission data. After GS I is output, if the header sent from the printer is [Hex=3Dh/Decimal=61], the data is processed as NUL [Hex=00h/Decimal=0] as a data block in accordance with the header and the identifier.

[Printer information B precautions]

- Each printer information consists of [header to NUL] (n=65-69 or n=112).

Send data	Hexadecimal	Decimal	Bytes
Header	5Fh	95	1 byte
Printer information B	Depending on model	Depending on model	0-80 byte
NUL	00h	0	1 byte

- If the printer information is not ready, send [Header+NUL] (2 bytes).
- The firmware version can be confirmed by self-test printing. The self-test is performed by performing GS (A or by panel switch operation when the power is turned on.
- Using the serial interface, XON/XOFF control when communicating with the printer, the XOFF code may interrupt the "Header to NUL" data string.
- Depending on the specific data of the transfer data block, the printer information can be recognized as other transfer data. When the header sent by the printer is [Hex=5Fh/Decimal=95], the NUL [Hex=00h/Decimal=0] is treated as a data group and identified in accordance with the following data.

Return information reference:

Printer model ID	80 Printer				
Instruction	Printer information	n value	Specific information	Return value (HEX)	ASCII
GS I n	Printer ID	1, 49	Printer ID	20	/
		2, 50	Type ID	03	/
		3, 51	Version ID	62	/
		4	/	00	/

	Printer information A	35	See model specific information	No	/
		96		No	/
	Printer information B	65	Firmware version	5F 38 2E 30 30 20 45 53 43 2F 50 4F 53 00	8.00 ESC/POS
		66	Name of producer	5F 4D 61 6E 75 66 61 63 74 75 72 65 72 3A 4A 2D 53 50 45 45 44	_Manufacturer: J-SPEED
		67	Model name	5F 50 72 69 6E 74 20 4E 61 6D 65 3A 50 38 30 2D 53 65 72 69 61 6C 73	_Print Name:P80-Seri als
		68	Serial number	5F 50 72 69 6E 74 65 72 2D 38 30 2D 54 4D 2D 34 38 37 34 36 37	_Printer-80-T M-487467
		69	Language and typeface used by per country	5F 43 48 49 4E 41 2C 47 42 31 38 30 33 30	_CHINA, GB18030
		112	Additional information 1	13 5F 30 00 11	XOFF 0 XON
		113	Additional information 2	13 5F 31 00 11	XOFF 1 XON
		217	Program burn date time	181008133327No	For example: October 8, 2018, 13:33: 27

### 103. GS (H response specifies the process ID

[Format]	ASCII code	GS ( H m a1 a2 a3 d1 d2 d3 d4
	Hexadecimal code	1D 28 48 m a1 a2 a3 d1 d2 d3 d4
	Decimal code	29 40 72 m a1 a2 a3 d1 d2 d3 d4
[Range]	m=6, a1 a2 a3 is an arbitrary value (filter), d1, d2, d3, d4 are processing IDs	
[Description]	Response specified process ID	
[Note]	The data format returned by the process ID is 0x37 0x22 0xd1 0xd2 0xd3 0xd4 0x00	

## Appendix X: Code 128

### X. 1 128 Code overview

The 128 code is capable of encoding 128 ASCII characters and 100 digits from, 00 to 99 as well as some special characters by alternately using the character set A the character set B, and the character set C. The characters encoded for each character set are as follows:

- Character set A: ASCII characters 00H to 5FH
- Character set B: ASCII characters 20H to 7FH
- Character set C: 100 digits from 00 ~ 99

The following special characters can also be encoded in 128 codes:

- The SHIFT character "SHIFT" enables the first character following the bar code symbol SHIFT character to be converted from the Character Set A to the Character Set B, or from the Character Set B to the Character Set A, starting with the second character, back to the character set previously used for SHIFT. The SHIFT character can only be switched between the character set A and the character set B. It cannot bring the current encoded character into or out of the state of character set C.
- The character set selects characters (CODE A, CODE B, CODE C) These characters convert the encoded characters that follow them to the character sets A, B, or C.
- The utility of the function characters (FNC1, FNC2, FNC3, FNC4) depends on the application software. In character set C, only FNC1 is available.

### X.2 character set

Characters in the character set A

Character	Send data		Character	Send data		Character	Send data	
	Hexadecimal code	Decimal code		Hexadecimal code	Decimal code		Hexadecimal code	Decimal code
NUL	00	0	(	28	40	P	50	80
L	01	1	)	29	41	Q	51	81
SOH	02	2	*	2A	42	R	52	82
STX	03	3	+	2B	43	S	53	83
ETX	04	4	,	2C	44	T	54	84
EOT	05	5	-	2D	45	U	55	85
ENQ	06	6	.	2E	46	V	56	86
ACK	07	7	/	2F	47	W	57	87
BEL	08	8	0	30	48	X	58	88
BS	09	9	1	31	49	Y	59	89
HT	0A	10	2	32	50	Z	5A	90
LF	0B	11	3	33	51	[	5B	91
VT	0C	12	4	34	52	\	5C	92
FF	0D	13	5	35	53	]	5D	93
CR	0E	14	6	36	54	^	5E	94
SO	0F	15	7	37	55	_	5F	95
SI	10	16	8	38	56	FNC	7B, 31	123, 49
DLE	11	17	9	39	57	1	7B, 32	123, 50
DC1	12	18	:	3A	58	FNC	7B, 33	123, 51
DC2	13	19	;	3B	59	2	7B, 34	123, 52
DC3	14	20	<	3C	60	FNC	7B, 53	123, 83
DC4	15	21	=	3D	61	3	7B, 42	123, 66
NAK	16	22	>	3E	62	FNC	7B, 43	123, 67

SYN	17	23	?	3F	63	4		
ETB	18	24	@	40	64	SHIF		
CAN	19	25	A	41	65	T		
EM	1A	26	B	42	66	COD		
SUB	1B	27	C	43	67	EB		
ESC	1C	28	D	44	68	COD		
FS	1D	29	E	45	69	EC		
GS	1E	30	F	46	70			
RS	1F	31	G	47	71			
US	20	32	H	48	72			
SP	21	33	I J	49	73			
!	22	34	K	4A	74			
"	23	35	L	4B	75			
*	24	36	M	4C	76			
\$	25	37	N	4D	77			
%	26	38	O	4E	78			
&	27	39		4F	79			

#### Characters in the character set B

Character	Send data		Character	Send data		Character	Send data	
	Hexadecimal code	Decimal code		Hexadecimal code	Decimal code		Hexadecimal code	Decimal code
SP	20	32	H	48	72	p	70	112
!	21	33	I	49	73	q	71	113
"	22	34	J	4A	74	r	72	114
*	23	35	K	4B	75	s	73	115
\$	24	36	L	4C	76	t	74	116
%	25	37	M	4D	77	u	75	117
&	26	38	N	4E	78	v	76	118
'	27	39	O	4F	79	w	77	119
(	28	40	P	50	80	x	78	120
)	29	41	Q	51	81	y	79	121
*	2A	42	R	52	82	z	7A	122
+	2B	43	S	53	83	{	7B, 7B	123, 123
,	2C	44	T	54	84		7C	124
-	2D	45	U	55	85	}	7D	125
.	2E	46	V	56	86	—	7E	126
/	2F	47	W	57	87	DEL	7F	127
0	30	48	X	58	88	FNC	7B, 31	123, 49
1	31	49	Y	59	89	1	7B, 32	123, 50
2	32	50	Z	5A	90	FNC	7B, 33	123, 51
3	33	51	[	5B	91	2	7B, 34	123, 52
4	34	52	\	5C	92	FNC	7B, 53	123, 83
5	35	53	]	5D	93	3	7B, 41	123, 65
6	36	54	^	5E	94	FNC	7B, 43	123, 67
7	37	55	_	5F	95	4		

8	38	56	`	60	96	SHIF		
9	39	57	a	61	97	T		
:	3A	58	b	62	98	COD		
;	3B	59	c	63	99	EA		
<	3C	60	d	64	100	COD		
=	3D	61	e	65	101	EC		
>	3E	62	f	66	102			
?	3F	63	g	67	103			
@	40	64	h	68	104			
A	41	65	i	69	105			
B	42	66	j	6A	106			
C	43	67	k	6B	107			
D	44	68	l	6C	108			
E	45	69	m	6D	109			
F	46	70	n	6E	110			
G	47	71	o	6F	111			

Characters in the character set C

Character	Send data		Character	Send data		Character	Send data	
	Hexadecimal code	Decimal code		Hexadecimal code	Decimal code		Hexadecimal code	Decimal code
0	00	0	40	28	40	80	50	80
1	01	1	41	29	41	81	51	81
2	02	2	42	2A	42	82	52	82
3	03	3	43	2B	43	83	53	83
4	04	4	44	2C	44	84	54	84
5	05	5	45	2D	45	85	55	85
6	06	6	46	2E	46	86	56	86
7	07	7	47	2F	47	87	57	87
8	08	8	48	30	48	88	58	88
9	09	9	49	31	49	89	59	89
10	0A	10	50	32	50	90	5A	90
11	0B	11	51	33	51	91	5B	91
12	0C	12	52	34	52	92	5C	92
13	0D	13	53	35	53	93	5D	93
14	0E	14	54	36	54	94	5E	94
15	0F	15	55	37	55	95	5F	95
16	10	16	56	38	56	96	60	96
17	11	17	57	39	57	97	61	97
18	12	18	58	3A	58	98	62	98
19	13	19	59	3B	59	99	63	99
20	14	20	60	3C	60	FNC	7B, 31	123, 49
21	15	21	61	3D	61	1	7B, 41	123, 65

22	16	22	62	3E	62	COD	7B, 42	123, 66
23	17	23	63	3F	63	EA		
24	18	24	64	40	64	COD		
25	19	25	65	41	65	EB		
26	1A	26	66	42	66			
27	1B	27	67	43	67			
28	1C	28	68	44	68			
29	1D	29	69	45	69			
30	1E	30	70	46	70			
31	1F	31	71	47	71			
32	20	32	72	48	72			
33	21	33	73	49	73			
34	22	34	74	4A	74			
35	23	35	75	4B	75			
36	24	36	76	4C	76			
37	25	37	77	4D	77			
38	26	38	78	4E	78			
39	27	39	79	4F	79			

## Appendix Y: Print mode and its conversion

Y. 1 Overview The printer has two operating modes: standard mode and page mode. in standard mode, whenever that print line buffer is full or receive

The print or feed command causes the printer to print and feed the paper. In the page mode, all printing data and paper feed commands are stored in the specified memory space, and the printer does not perform any operations. Until an **ESC FF** or **FF** command is received, the printer will print all the contents of the print area.

For example, when the printer receives "ABCDEF" <LF> in standard mode, it immediately prints "ABCDEF" and feeds one line of paper. In the page mode, the printer writes "ABCDEF" to the printing area in memory, and the next print data is placed on the next line of the print area. The **ESC L** command switches the printer to page mode, after which all data is processed in page mode. In this way, executing the **ESC FF** command prints all the data received, while executing the **FF** command not only prints all the data received, but also switches the printer to standard mode. Executing the **ESC S** command also switches the printer to standard mode, but it does not printing data received in page mode and clears it.

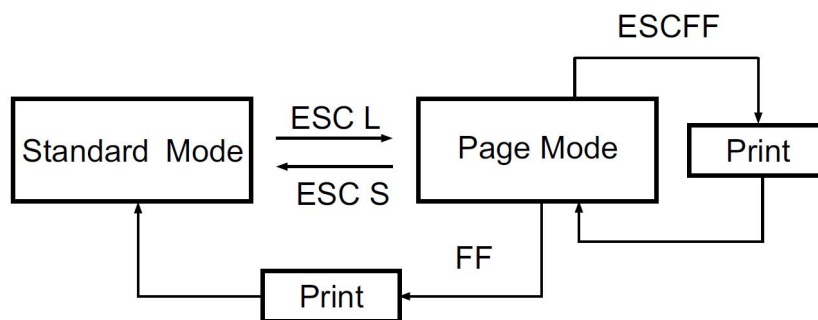


Figure Y. 1 Switching between the standard mode and the page mode

## Y. 2 Set various values in the standard mode and the page mode

1) Some commands (e. g. **ESC SP**, **ESC 2**, **ESC 3**, and **FS S**) can be employed in both standard mode and page mode, and their parameters are the same. But the settings in the two modes are independent and they are stored separately.

## Y. 3 Printing area setting

1) The printing area is set by the **ESC W** command. If all the printing and feeding operations have been completed before receiving the **ESC W** command, the printer takes the left (when you face the printer) as the coordinate origin (x0, y0) of the printing area.

The width (dx point) of the rectangular printing area extends to the right from the coordinate origin (x0, y0) in the x direction (perpendicular to the paper feed direction); the height (dy point) is in the y direction (paper feed direction). If the printing area is not set with **ESC W**, the printing area assumes the default value.

2) After the printer sets the printing area and the direction of the printing area (set by **ESC T** command), the received printing data will be arranged in the printing area in accordance with the position shown in Figure B. 2. Point A is the start position of the printing area, which is the default value.(when a character is printed, point A serves as a baseline) the downloaded bitmap or bar code data in the printed data is aligned with the baseline with the current position as its lower left corner (point B in Figure B. 3).

3) Before receiving a command (e. g. **LF** or **ESC J**) containing paper feed, if the print data (including character spacing) has exceeded the print area, the printer automatically feeds a line of paper (how much paper is fed, depending on the line height set by **ESC 2** and **ESC 3**), and the printing position moves to the beginning of the next line.

4) The default row height is 1/6 inch, equivalent to 31 points in the longitudinal direction. If the printing data on the next line contains characters enlarged by more than 2 times longitudinally, or the bitmap occupies 2 or more lines, and the bar code is higher than the normal characters, the paper feed of the printer cannot meet the requirements, resulting in the superposition of the printed characters and the characters printed on the previous line. To avoid this, you can increase the row height. For example, when printing a download bitmap with a height of 6 bytes, use the following formula:

{The number of longitudinal points (8×6)-the number of feed points (24) at the starting of the printing area}×the longitudinal moving units (200/200)=24, that is, to print the complete bitmap, the printing position needs to be shifted down by 24 points on the basis of the start position of the printing area. Use the following command:

**ESC W xL, xH, yL, yH, dxL, dxH, dyL, dyH ESC T n**

**ESC 3 24 Å** Sets the new row height

**LF**

**GS / 1**

**ESC 2 Å** Restores the row height to 1/6 inch



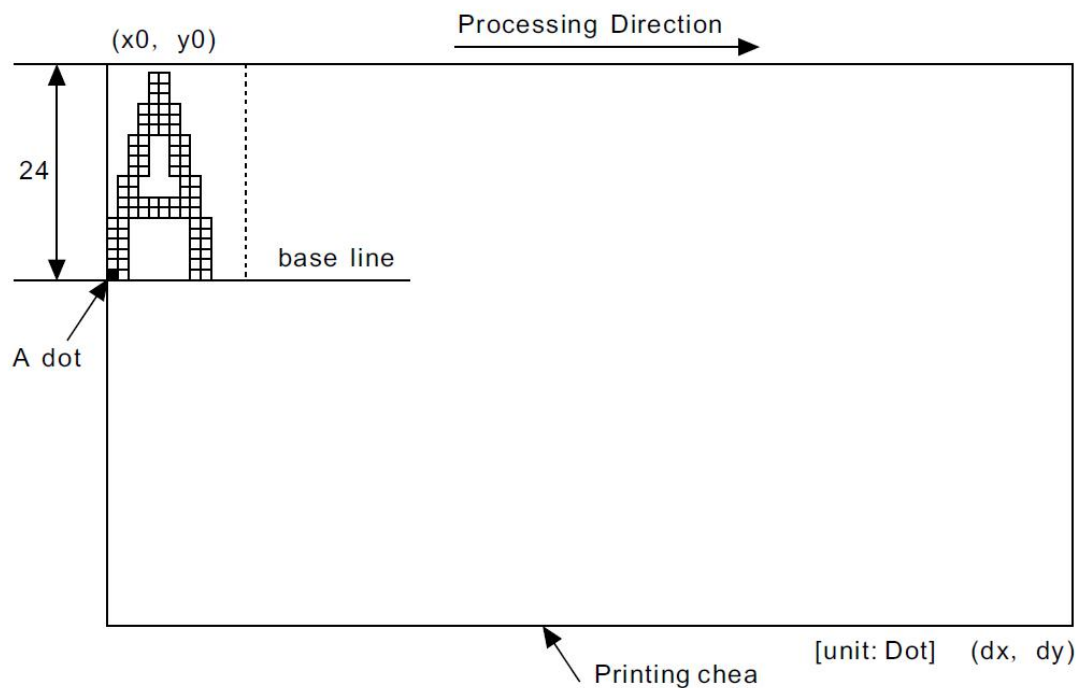


Figure Y. 2 Storage location of character data

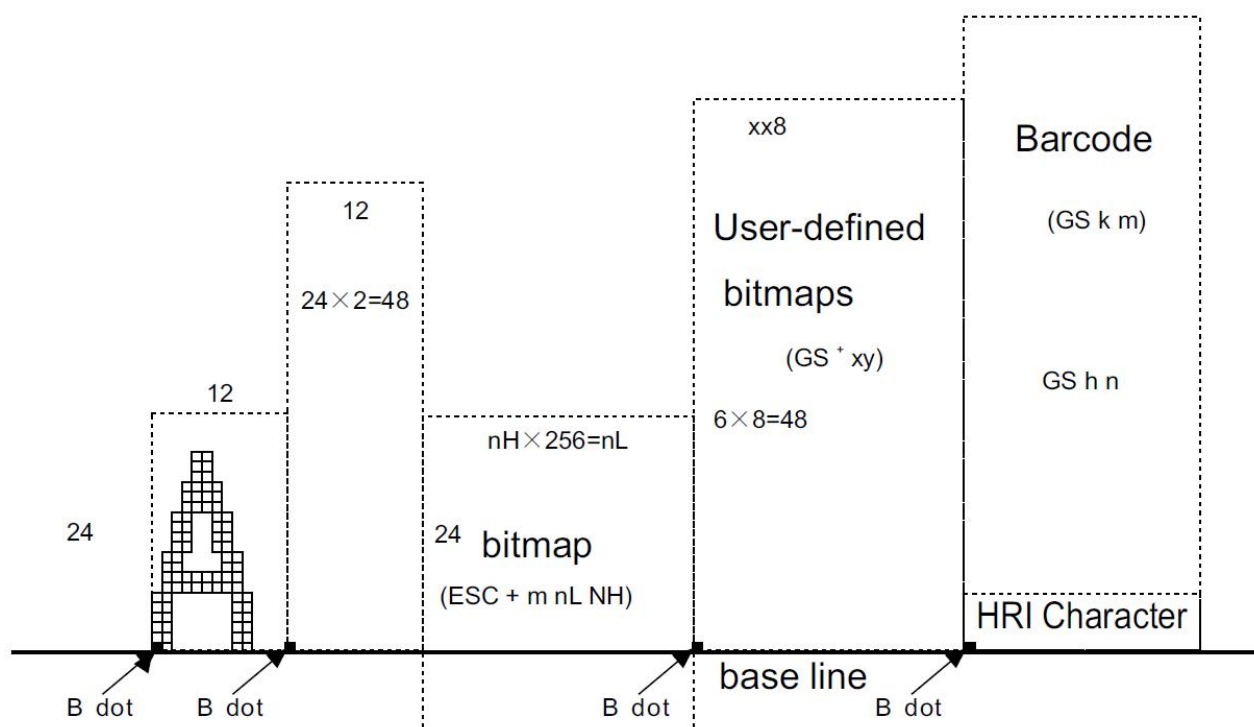


Figure Y. 3 Storage location of printing data

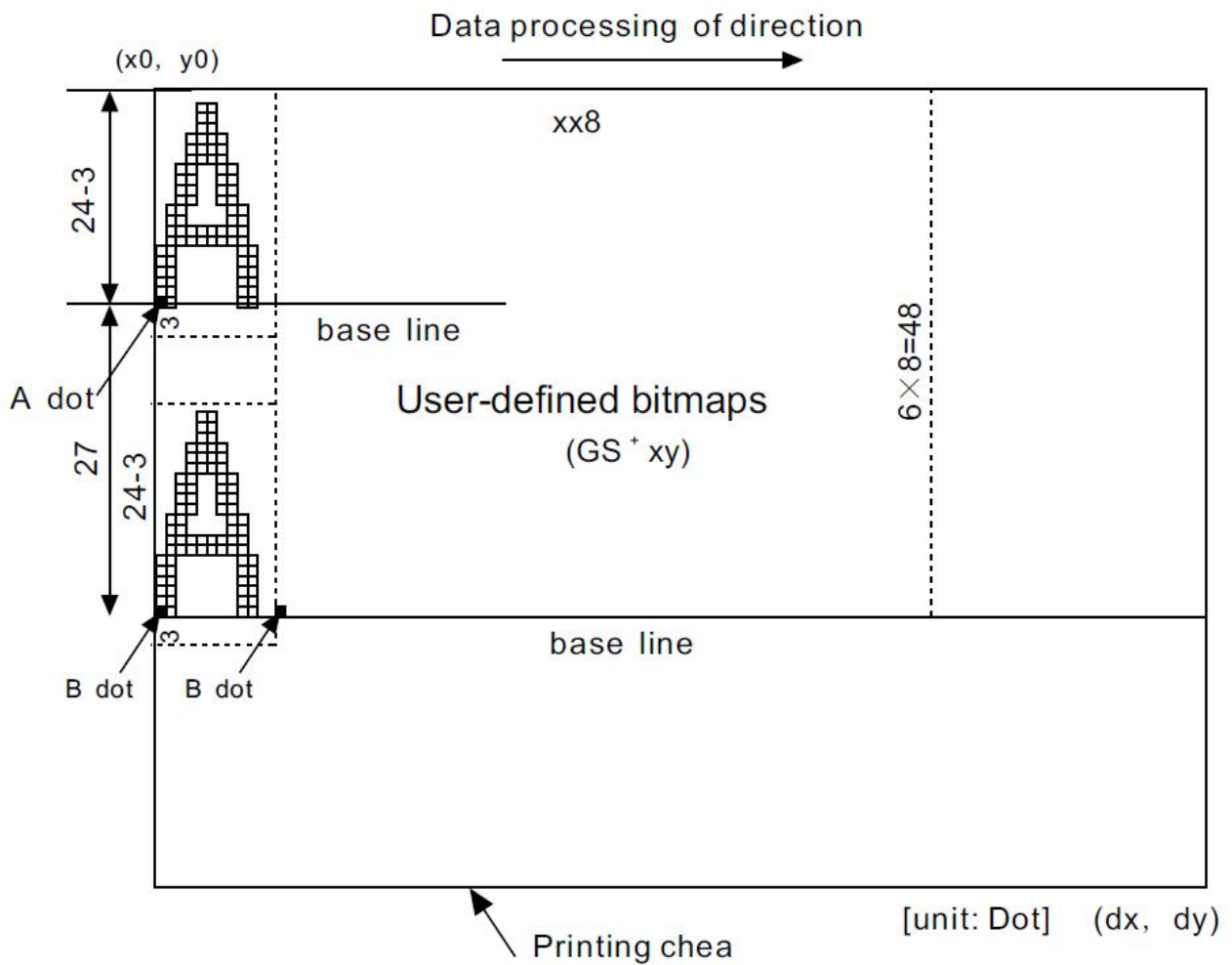


Figure Y. 3 Storage location of download bitmap

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