MANUAL DE COMANDOS

PARA IMPRESSORA ZP250 US-QR

CONTENTS

1 COMMANDS

The command explanations include the following parts:

1）**Name and the general description of the command's function**---This is the first part for the command description; it presents the command's ASCII code format and general description of its function.

2）**Format**---This part used ASCII coding form, decimal code, and hex code to describe the command.

3）**(Parameter) Range**---This part gives the range of the variable. If there is special explanation, it should be the decimal value. E.g. $1 \le n \le 4$，in which the number '1' is the decimal value, but the ASCII coding form.

4）**Description**---This part is to explain the command in detail.

5）**Note**---This part gives the attention items of the command. As the commands may interfere with each other when they are used in different modes or when they co-work with different commands, yet this part gives the details for these attention items.

	Command	Decimal	Hex	Function
1	HT	9	9	Horizontal tab
2	LF	10	0A	Print and line feed
3	FF	12	0C	Print and recover to page mode
4	CR	13	0D	Print and carriage return
5	DLE DC4 n m t	16 20	10 14	Real-time output of drawer pulse
6	DLE EOT	16 4	10 04	Transmit real-time state
7	CAN	24	18	Cancel print data in page mode
8	ESC FF	27 12	1B 0C	Print data in page mode
9	ESC SP	27 32	1B 20	Set right-side character spacing
10	ESC !	27 33	1B 21	Select print mode(s)
11	ESC $	27 36	1B 24	Set absolute print position
12	ESC *	27 42	1B 2A	Select bit-image mode
13	ESC -	27 45	1B 2D	Turn underline mode on/off
14	ESC 2	27 50	1B 32	Select default line spacing
15	ESC 3	27 51	1B 33	Set line spacing
16	ESC =	27 61	1B 3D	Select printer or VFD
17	ESC @	27 64	1B 40	Initialize printer
18	ESC D	27 68	1B 44	Set horizontal tab positions
19	ESC J	27 74	1B 4A	Print bitmap lattice data, and feed n lines
20	ESC L	27 76	1B 4C	Select page mode
21	ESC M n	27 77	1B 4D	Select character font
22	ESC S	27 83	1B 53	Select standard mode
23	ESC T	27 84	1B 54	Select character print direction in page mode
24	ESC V	27 86	1B 56	Specify/cancel character 90 degree clockwise rotation

25	ESC	W	27	87	1B	57	Set printing area in page mode
26	ESC	\	27	92	1B	5C	Specify relative position
27	ESC	a	27	97	1B	61	Position alignment
28	ESC	d	27	100	1B	64	Print and feed paper n lines
29	ESC	i	27	105	1B	69	Execute partial-cut
30	ESC	m	27	109	1B	6D	Partial cut (three points left uncut)
31	ESC	p	27	112	1B	70	Specify cash drawer pulse
32	ESC	t	27	116	1B	74	Select character code table
33	ESC	{	27	123	1B	7B	Turn upside-down printing mode on/off
34	FS	!	28	33	1C	21	Set Chinese characters mode
35	FS	S	28	83	1C	53	Set Chinese character space amount
36	FS	p	28	112	1C	70	Print bit image that download to flash
37	FS	q	28	113	1C	71	Define NV bit image
38	GS	!	29	33	1D	21	Select character size
39	GS	$	29	36	1D	24	Specify absolute position for character vertical direction in page mode
40	GS	H	29	72	1D	48	Select printing position of HRI characters
41	GS	L	29	76	1D	4C	Set left margin
42	GS	P	29	80	1D	50	Set basic calculated pitch
43	GS	V	29	86	1D	56	Select paper-cut mode and cut paper
44	GS	\	29	92	1D	5C	Specify relative position for character vertical direction in page mode
45	GS	h	29	104	1D	68	Set bar code height
46	GS	k	29	107	1D	6B	Print bar code
47	GS	(	29	40	1D	28	Set up and print the symbol
48	GS	v	29	118	1D	76	Print raster bitmap
49	GS	w	29	119	1D	77	Set bar code width

(1)

● **HT   Horizontal tab**

Format: ASCII   HT

                      Decimal   9

                      Hex   09

Description: Moves the print position to the next horizontal tab position.

Notes:

● This command is ignored unless the next horizontal tab position has been set.

● If the next horizontal tab position exceeds the printing area, the printer sets the printing position to [printing

area width + 1].

- Horizontal tab positions are set with ESC D.
- If this command is received when the printing position is at [printing area width + 1], the printer executes print bufferfull printing of the current line and horizontal tab processing from the beginning of the next line.

Reference : ESC D

(2)

- **LF**   Print and line feed

Format:	ASCII	LF
	Decimal	10
	Hex	0A

Note:
- LF prints the data in the print buffer and fed per line based on the current line space.
- Print characters with CR command.

(3)

- **FF**   Print and recover to page mode

Format:	ASCII	FF
	Decimal	12
	Hex	0C

Description: Prints all buffered data to the print region collectively, then recovers to the standard mode.

Note:
- All buffer data is deleted after printing.
- The print area set by ESC W (Set print region in page mode) is reset to the default setting.
- No paper cut is executed.
- Sets the print position to the beginning of the next line after execution.
- This command is enabled only in page mode.

Reference: ESC FF, ESC L, ESC S

(4)

- **CR**   Print and carriage return

Format:	ASCII	CR
	Decimal	13
	Hex	0D

Note:
- Set the print position to the beginning of the line.
- Print characters with LF command.

(5)

- DLE DC4 n m t Real-time output of drawer pulse

Format:	ASCII	DLE	EOT	n	m	t
	Decimal	16	20	n	m	t
	Hex	10	14	n	m	t
Range:	n = 1					
	m = 0, 1					
	$1 \leq t \leq 8$					

Description: This outputs a signal specified by t to the connector pin specified by m.

m	Pin #
0	#2 Pin of the drawer kick connector
1	#5 Pin of the drawer kick connector

On time is set to t x 100 msec; Off time is set to t x 100 msec.

Note:

- This command is ignored while outputting the pulse (while executing either ESC p or DEL DC4) to the connector pin while processing this command.
- This command is executed as long as printer receivers this command in serial mode.
- This command cannot be executed when the printer is busy in parallel mode.
- If printing data string is the same as this command, then the printing data string will be executed as this command. Users should pay attention to this case.
- Do not use this command to interrupt code strings of other commands that consist of 2 or more codes.
- This command is enabled even when the printer specification is disable by ESC= (select peripheral devices).

(6)

- DLE EOT n   Transmit real-time state

Format:

ASCII	DLE	EOT	n	
Decimal	16	4	n	
Hex	10	04	n	

Range: $1 \leqslant n \leqslant 4$

Note:

- This command is only suitable for the printer model of serial port.
- Transmit the real-time state parameter n of the printer, in order to designate the deferent printer state, define as follows:

n=1: transmit printer state;

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Cash drawer open
	On	04	4	Cash drawer closed
3	Off	00	0	Online
	On	08	8	Offline
4	On	10	16	Fixed to On
5	Off	00	00	Not wait for online resume
	On	20	32	Wait for online resume
6	—	—	—	Undefined
7	Off	00	00	Fixed to Off

n=2: transmit offline state;

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On

	Off	00	0	Upper cover closed
2	On	04	4	Upper cover open
3	Off	00	0	Not press paper feed key
	On	08	8	Press paper feed key
4	On	10	16	Fixed to On
5	Off	00	00	Paper adequate
	On	20	32	Printer no paper
6	Off	00	0	No error
	On	40	64	Error
7	Off	00	0	Fixed to Off

n=3: transmit error state;

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2		—	—	Undefined
3	Off	00	0	Cut no error
	On	08	8	Cut error
4	On	10	16	Fixed to On
5	Off	00	0	No beyond retrieve error
	On	20	32	Beyond retrieve error
6	Off	00	0	Printer temperature and voltage normal
	On	40	64	Printer temperature or voltage over range
7	Off	00	0	Fixed to Off

n=4: transmit paper roll sensor state;

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2, 3	Off	00	0	Paper adequate
	On	0C	12	Paper near end
4	On	10	16	Fixed to On
5,6	Off	00	00	Paper adequate
	On	60	96	Paper end
7	Off	00	0	Fixed to Off

(7)

● **CAN**   Cancel

   Format: ASCII   CAN

            Decimal   24

            Hex   18

Description: Deletes all print data in the currently set print region in page mode.

Note: .
- This command is enabled only in page mode.
- Portions included in the currently set print region are also deleted, even if previously set print region data.

Reference: ESC L, ESC W

(8)

- **ESC FF**   print data in page mode

  Format: ASCⅡ   ESC   FF

  Decimal   27   12

  Hex   1B   0C

  Description: Prints all buffered data in the print area collectively in page mode.

  Note:

- This command is enabled only in page mode.
- Holds the following information after printing.

  a. Expanded data

  b. Character print direction selection in page mode (ESCT)

  c. Set print region (ESCW) in the page mode.

  d. Character expansion position

  Reference: FF, ESCL, ESCS

(9)

- **ESC SP n**   Set right-side character spacing

  Format: ASCII   ESC   SP   n

  Decimal   27   32   n

  Hex   1B   20   n

  Range: $0 \leqslant n \leqslant 255$

  Initial Value: n=0

  Function: Set the right space amount for the character to [n $\times$ basic calculated pitch].

  Details:

- If the character horizontal direction magnification ratio is more than 2, the right space amount is also enlarged accordingly.
- This command does not affect Chinese characters.
- Right space amounts can be set independently for both the standard and page modes.
- The basic calculated pitch is set by GSP (Set basic calculated pitch). Also, after setting the right space amount, it is not affected even if the basic calculated pitch is changed.
- If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.
- In standard mode, the basic calculated pitch (x) for the horizontal direction is used.
- In page mode, the basic calculated pitch that is used according to the starting point varies.

  a. When the starting point is specified to be upper left or lower right by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (x) for the horizontal direction is used.

  b. When the starting point is specified to be upper right or lower left by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (y) for the horizontal direction is used.

- The maximum value that can be set for the right space amount is approximately 35.983 mm (or 255/180 inch). Specifications that exceed the maximum value are rounded off to that value.

(10)

● **ESC !**   **Select print modes**

Format: ASCⅡ   ESC   !   n

            Decimal   27   33   n

            Hex   1B   21   n

Range   0≤n≤255

Initial Value   n=0

Function   Select print mode(s) using n as follows.

Bit	Off/On	1/0	Hex	Decimal	Functions
0	Off	0	00	0	Character font A(12×24) selected
1，2	Off		---	---	Reserved
3	Off	0	00	0	Emphasized mode not selected.
	On	1	08	8	Emphasized mode selected.
4	Off	0	00	0	Double-height mode not selected.
	On	1	10	16	Double-height mode selected.
5	Off	0	00	0	Double-width mode not selected.
	On	1	20	32	Double-width mode selected.
6	Off		---	---	Reserved
7	Off	0	00	0	Underline mode not selected.
	On	1	80	128	Underline mode selected.

Details:

● Quadruple-size characters are printed by specifying both double-tall (bit4=1) and double-wide (bit 5=1) modes.

● An underline is applied to the entire character width, including the ESC SP (character right space amount). However, underlines are not applied to portions that have been skipped using HT (horizontal tab) or ESC V (character 90 degree rotation).

● The thickness of the underline is set by ESC - (specify/cancel underlines) regardless of the character.

● The base line for characters is the same when there are characters having different vertical direction ratios in the same line.

● The setting of the last received command is effective even when emphasized printing is executed by the ESC E (specify/cancel emphasized printing) command.

● The setting of the last received command is effective even when underlines are executed by the (ESC -) Specify/cancel underline command.

● The setting of the last received command is effective even when character size is executed by the GS! command.

● Emphasized printing (bit 3) is effective for ANK and Chinese characters. Other printing modes are effective only on ANK characters. Specifications using this command are ignored in HRI characters.

The following are the font configurations on printers.

Reference: ESC-, ESC E, GS!

(11)

● **ESC $**   Set absolute print position

Format: ASCⅡ   ESC $ nL   nH

            Decimal   27   36   nL   nH

            Hex   1B   24   nL   nH

Range: 0≤nL≤255

                  0≤nH≤255

Description:

Specifies the next printing starting position using an absolute position based on the left margin position. The next printing starting position is the position specified by [(nL+nH×256) × basic calculated pitch] from the left margin position.

Note:

● Specifications exceeding the print range are ignored.

● The basic calculated pitch is set by GSP (Set basic calculated pitch).

● If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.

● In standard mode, the basic calculated pitch (x) for the horizontal direction is used.

● In page mode, the basic calculated pitch that is used according to the starting point varies.

  a. When the starting point is specified to be upper left or lower right by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (x) for the horizontal direction is used.

  b. When the starting point is specified to be upper right or lower left by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (y) for the horizontal direction is used.

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

(12)

●   ESC *   Select bit-image mode

Format:	ASCII	ESC	*	m	nL	nH	d1 ... dk
	Decimal	27	42	m	nL	nH	d1 ... dk
	Hex	1B	2A	m	nL	nH	d1 ... dk

Range: m=0, 1, 32, 33

             0≤nL≤255

             0≤nH≤3

             0≤d≤255

ESC * m nL nH d1 ... dk selects a bit-image mode using m for the number of dots specified by (nL + nH×256).   Set a bit to 1 to print a dot, or set a bit to 0 to not print a dot. d indicates the bit image data. The modes selectable by m are as follows:

m	Mode	Vertical direction		Horizontal direction	
		Number of bits for vertical data	Dot density (DPI)	Dot density (DPI)	Amount of data (k)
0	8-dot single-density	8	68	101	192
1	8-dot double-density	8	68	203	384
2	24-dot single-density	24	203	101	192
33	24-dot double-density	24	203	203	384
39	24-dot double-density	24	203DPI	203DPI	384

(13)

●   ESC -   Turn underline mode on/off

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

Range: 0≤n≤1

0: turn underline mode off

1: turn underline mode on

(14)

● ESC 2   Select default line spacing

Format:	ASCⅡ	ESC	2
	Decimal	27	50
	Hex	1B	32

Description: Sets line feed amount per one line to approximately 4.23 mm (1/6 inch).

Note: Line spacing can be set independently for both the standard and page modes.

Reference: ESC 3

(15)

● ESC 3   Set line spacing

Format:	ASCⅡ	ESC	3	n
	Decimal	27	51	n
	Hex	1B	33	n

Range: $0 \leqslant n \leqslant 255$

Description: Sets the line space for one line to [n x basic calculated pitch].

Note:

● ESC 3 n sets the line spacing to $n \times$ (vertical or horizontal motion unit). The default setting of the paper feed amount is 1/6 inch (n=60). The maximum line spacing amount is 40 inches. When standard mode is selected, the vertical motion unit set by GS P is used. When page mode is selected, the vertical or horizontal motion unit set by GS P is used for the print direction set by ESC T.

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

● The basic calculated pitch is set by GSP (Set basic calculated pitch). Also, after setting the line space, it is not affected even if the basic calculated pitch is changed.

● If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.

● In standard mode, the basic calculated pitch (y) for the vertical direction is used.

● In page mode, the basic calculated pitch that is used according to the starting point varies.

　　a. When the starting point is specified to be upper left or lower right by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (x) for the horizontal direction is used.

　　b. When the starting point is specified to be upper right or lower left by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (y) for the horizontal direction is used.

● The maximum value that can be set for the line space is approximately 1,016mm (or 40 inches). Specifications that exceed the maximum value are rounded off to that value.

Reference: ESC 2, GS P

(16)

● ESC = n   Select printer or VFD

Format:	ASCII	ESC	=	n
	Decimal	27	61	n
	Hex	1B	3D	n

Range: $1 \leqslant n \leqslant 2$

Function: Selects the printer or VFD for which the data is effective from the host computer.

Bit	1/0	Hex	Decimal	Function
0	0	00	0	Printer invalid
1	1	01	1	Printer valid
2	2	02	2	VFD valid
3-7		-	-	Undefined

The function of bit 3~7 are undefined.

Details: If the printer is selected to be invalid, the printer discards all data from the next data until the printer is made valid again by this command. (This excludes DLEEOT, DLEENQ, DLEDC4.)

Even when the printer is not invalid, the printer specification of this command (n = 1) is processed.

(17)

● ESC   @   Initialize printer

Format:	ASCⅡ	ESC	@
	Decimal	27	64
	Hex	1B	40

ESC @ initializes the printer. All settings, including character font and line spacing settings, are canceled. The data in the print buffer is cleared and the printer mode is reset to the mode that was in effect when the power was turned on. The DIP switch settings are not checked again, the data in the receive buffer is not cleared, and any macro definitions are not cleared.

(18)

● ESC   D   Set horizontal tab positions

Format:	ASCⅡ	ESC	D	n1 … nk NUL
	Decimal	27	68	n1 … nk 00
	Hex	1B	44	n1 … nk 0

Range: 1≤n≤255

0≤k≤32

Description:

ESC D n1 … nk NUL sets a horizontal tab position to n columns from the beginning of a line, with k indication the total number of horizontal tab positions to be set. When a left margin is set in standard mode, the position of the left margin is the beginning of the line. A maximum of 32 tab positions can be set. This command cancels any previous horizontal tab settings. The default tab positions are every eight characters for the font A (12×24).

Note: The character width is stored for standard and page modes.

Reference: HT

(19)

● **ESC   J**   Print and feed paper

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

Range: 0≤n≤255

Description:

ESC J n prints the data in the print buffer and feeds the paper n×(vertical or horizontal motion unit). This command is used to temporarily feed a specific length without changing the line spacing set by other commands. The maximum paper feed amount is 40 inches. When standard mode is selected, the vertical

motion unit set by GS P is used. When page mode is selected, the vertical or horizontal motion unit set by GS P is used fro the print direction set by ESC T.

Note:

- In standard mode, the basic calculated pitch (y) for the vertical direction is used.
- In page mode, the basic calculated pitch that is used according to the starting point varies.
  a. When the starting point is specified to be upper left or lower right by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (x) for the horizontal direction is used.
  b. When the starting point is specified to be upper right or lower left by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (y) for the horizontal direction is used.
- Paper is fed approximately 1016 mm if the [n x basic calculated pitch] exceeds approximately 1016mm (40 inches).

Reference: GS P

(20)

- ESC   L   Select page mode

  Format: ASCⅡ   ESC   L

  Decimal   27   76

  Hex   1B   4C

Description: Switches from standard mode to page mode.

Note:

- Enabled only when input with the top of line.
- Invalid when input by page mode.
- Returns to standard mode after the following commands are issued.
  a. FF (Print and recover to page mode)
  b. ESC S (Select standard mode)
- Character expansion position has the starting point specified by ESC T (Character print direction selection in page mode) in the printing region designated by the ESC W (Set print region in the page mode) command.
- This command switches the settings for the following commands the values of which can be set independently in standard mode and page mode to those for page mode.
  a. Set space amount: ESC SP, FS S
  b. Set line feed amount: ESC 2, ESC 3
- The following commands are enabled only when in page mode.
  a. ESC V :Specify/cancel character 90 degree clockwise rotation
  b. ESC a :Position alignment
  c. ESC { :Specify/cancel upside-down printing
  d. GS L :Set left margin
  e. GS W :Set print region width
- The following command is ignored in page mode.
  a. GS (A :Test print
- The following commands are invalid in page mode.
  a. FSp :Print NV bit image
  b. FSq :Define NV bit image
  c. FSg1 :Write data to user NV memory
  d. GSv0 :Print raster bit images
- Recover to standard mode using ESC@ (initialize printer).

11

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

(21)

● ESC M n   Select character font

Format:	ASCⅡ	ESC	M	n
	Decimal	27	77	n
	Hex	1B	4D	n

Description: Select character font.

n	Function
0,48	Selects Font A (12 x 24).
1,49	Selects Font B (9 x 17).

Note:

● Currently only support Font A (12 x 24).

(22)

● ESC S   Select standard mode

Format:	ASCⅡ	ESC	FF
	Decimal	27	83
	Hex	1B	53

Description: Switches from page mode to standard mode.

Note:

● Valid only when input by page mode.
● All buffer data in page mode is deleted.
● Sets the print position to the beginning of the next line after execution.
● The print area set by ESCW (Set print region in page mode) is reset to the default setting.
● This command switches the settings for the following commands the values of which can be set independently in standard mode and page mode to those for standard mode
  a. ESC SP :Set character right space amount
  b. FS S :Set Chinese character space amount
  c. ESC 2 :Set default line spacing
  d. ESC 3 :Set line feed amount
● The following commands are effective only when in standard mode.
  a. ESC W :Set print region in page mode
  b. ESC T :Select character print direction in page mode
● The following commands are ignored in standard mode.
  a. GS S :Specify absolute position for character vertical direction in page mode
  b. GS \: :Specify relative position for character vertical direction in page mode
● Standard mode is selected when the power is turned on, the printer is reset or initialized (ESC @).

Reference: FF, ESC FF, ESC L

(23)

● ESC T   Select character print direction in page mode

Format:	ASCⅡ	ESC	FF
	Decimal	27	84
	Hex	1B	54

Range: $0 \le n \le 3, 48 \le n \le 51$

Initial Value: n = 0

Description: Selects the character printing direction and starting point in page mode.

n	Print Direction	Starting Point
0, 48	Left to Right	Upper Left (A in the figure below)
1,49	Bottom to Top	Lower Left (B in the figure below)
2,50	Right to Left	Lower Right (C in the figure below)
3,51	Top to Bottom	Upper Right (D in the figure below)
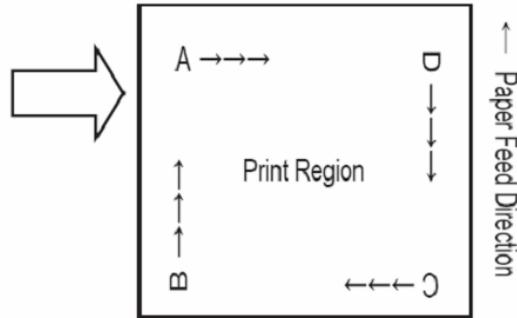
Note:

● Executes only a printer internal flag operation when this command is input in standard mode. The command does not affect printing in standard mode.

● The character expansion starting point is in the print region specified by ESC W (Set print region in page mode).

● The basic calculated pitch (x or y) used with the following commands differs according to the starting point.

a. If the starting point is upper left or lower right (feeds paper and expands characters in the vertical direction)

Commands using x :   ESC SP, ESC $, ESC \, FS S

Commands using y :   ESC 3, ESC J, GS $, GS \

b. If the starting point is upper right or lower left

Commands using x :   ESC 3, ESC J, GS $, GS \

Commands using y :   ESC SP, ESC $, ESC \, FS S

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

(24)

ESC V   Specify/cancel character 90 degree clockwise rotation

Format: ASCⅡ   ESC   V   n

          Decimal   27   86   n

          Hex   1B   56   n

Range: $0 \le n \le 1, 48 \le n \le 49$

Initial Value: n = 0

Description: Specifies or cancels character 90 degree clockwise rotation

n	Function
0,48	Cancels 90 degree clockwise rotation.
1,49	Specifies 90 degree clockwise rotation.

Note:

● Underlines are not applied to characters rotated 90 degrees clockwise even when ESC !, ESC . or

FS . commands are given.

- If 90 degree clockwise rotation is specified, double-wide and double-tall commands in the 90 rotation mode enlarges characters in the opposite directions to double-wide and double-tall commands.
- This command only affects printing in standard mode.
- In page mode, this command is only effective for the setting.
- This command is effective for ANK and Chinese characters.

Reference: ESC !, ESC -

(25)

- ESC W   Set printing area in page mode

Format:	ASCⅡ	ESC	W	xL xH yL yH dxL dxH dyL dyH
	Decimal	27	87	xL xH yL yH dxL dxH dyL dyH
	Hex	1B	57	xL xH yL yH dxL dxH dyL dyH

Range: $0 \leqslant$ xL, xH, yL, yH, dxL, dxH, dyL, dyH $\leqslant 255$ (except for dxL = dxH = 0 or dyL= dyH =0)

**Description:**

✧ ESC W xL xH yL yH dxL dxH dyL dyH sets the size and position of the printing area in page mode as follows:

* Horizontal starting position = $(xL + xH \times 256)$ (horizontal motion unit)
* Vertical starting position = $(yL + yH \times 256)$ (vertical motion unit)
* Printing area width = $(dxL + dxH \times 256)$ (horizontal motion unit)
* Printing area height = $(dyL + dyH \times 256)$ (vertical motion unit)

✧ The default settings are as follows:

* xL = 0, xH = 0, yL = 0, yH = 0
* dxL = 0, dxH = 2, dyL = 126, dyH = 6

✧ This command is enabled only in page mode. If this command is processed in standard mode, an internal flag is activated and this command is enabled when the printer selects page mode.

✧ The horizontal and vertical motion units use the horizontal and vertical values set by the GS P command. The default settings of the horizontal and vertical motion units are 1/180 and 1/360 inches, respectively.

Note:

- In standard mode, the printer executes only internal flag operations with this command is input.
- If the horizontal direction starting point or vertical direction starting point is outside of the printable region, the command is stopped and normal printing commences from subsequent data.
- If the horizontal direction length or vertical direction length is 0, the command is stopped and normal printing commences from subsequent data.
- The character expansion starting point is the point specified by selecting the character printing direction (ESC T) in page mode in the print region.
- If (horizontal direction starting position + horizontal direction length) exceeds the printable region in the horizontal direction, the horizontal direction length is set to (horizontal direction printable region - horizontal direction starting point).
- If (vertical direction starting position + vertical direction length) exceeds the printable region in the vertical direction, the vertical direction length is set to (vertical direction printable region – vertical direction starting point).
- The basic calculated pitch is set by GSP (Set basic calculated pitch). Also, the set printing region is not changed even if the basic calculated pitch is changed after setting the print region.
- If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is

discarded.

- The basic calculated pitch (x) is used in the calculated pitch for the horizontal direction starting point and the length in the horizontal direction; and the basic calculated pitch (y) is used in the calculated pitch for the vertical direction starting point and the length in the vertical direction.
- The print region shown in the figure below when the horizontal direction starting is X; the vertical direction starting point is Y; the horizontal direction length is Dx; and the vertical direction length is Dy.
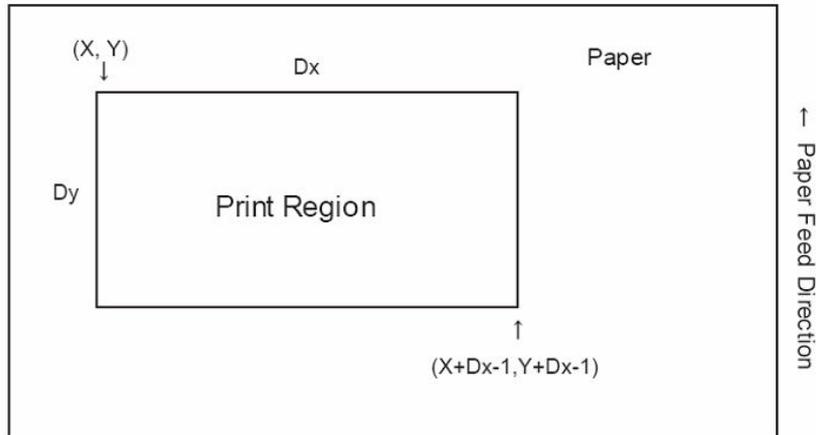
Reference: CAN, ESC L, ESC T, GSP

(26)

- ESC \ nL nH   Specify relative position

Format:

ASC II	ESC	FF
Decimal	27	92
Hex	1B	5C

Range: $0 \le nL \le 255, 0 \le nH \le 255$

Description:

Specifies the next print starting position with a relative position based on the current position. This sets the position from the current position to [(nL + nH x 256) x basic calculated pitch] for the next print starting position.

Note:

- Specifications exceeding the print range are ignored.
- If the right direction of the current position is specified for the character direction, specify a positive number; if the left direction is specified, a negative number is used.
- Negative numbers is represented by the complement of 65536. For example, when moving in the left direction n pitches, use: $nL + nH \times 256 = 65536-N$
- The basic calculated pitch is set by GSP (basic calculated pitch setting).
- If there are fractions in the result, correct to the minimum mechanical pitch and discard.
- Use the basic calculated pitch (x) for the horizontal direction in standard mode.
- The following operations occur according to the starting point in page mode.
  a. If the starting point is set to upper left or lower right by the ESC T (Select character print direction in page mode) command, specify the relative position of the vertical direction in the paper feed. Use the basic calculated pitch (x) for the horizontal direction at this time.
  b. If the starting point is set to upper right or lower left by the ESC T (Select character print direction in page mode) command, move the print position in the paper feed direction. Use the basic calculated pitch (y) for the horizontal direction at this time.

Reference: ESC $, GS P

(27)
● ESC a   Position alignment

Format: ASCII   ESC   a   n
                 Hex.   1B   61   n
                 Decimal   27   97   n

Range: $0 \le n \le 2, 48 \le n \le 50$

Default Value: n = 0

Description: Aligns all print data in one line to a specified position.

N	Position
0, 48	Left alignment
1, 49	Center
2, 50	Right alignment

Notes:
● This command is effective only when input at the top of the line when standard mode is being used.
● This command has no affect in page mode. In page mode, this command is only effective for the setting.
● Specifies the alignment position in the printing region that has been set.
● Portions skipped using command HT, ESC $ and ESC \ are also targeted for position alignment.

E.g.

Left alignment	**Center**	**Right alignment**
ABC ABCD ABCDE	ABC ABCD ABCDE	ABC ABCD ABCDE

(28)
● ESC d   Print and feed paper n lines

Format: ASCII   ESC   d   n
            Hex.   1B   64   n
            Decimal   27   100   n

Range: $0 \le n \le 255$

Description: Prints the data in the print buffer and performs a paper feed of n lines.

Notes:
● Sets the print position to the beginning of the next line after printing.
● Line feeds set by command ESC 2 and ESC 3 are not affected.
● Paper is fed approximately 1016 mm (40 inc hes) if the [n x line feed amount] exceeds approximately 1016 mm (40 inches) .

Reference: ESC 2, ESC 3

(29)
● ESC i   Execute partial-cut (one point left uncut)

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

Description: Execute a partial cut of the paper.

(30)

● ESC m Execute partial-cut (three point left uncut)

Format: ASCII ESC m

Decimal 27 109

Hex. 1B 6D

Range: **None**

Default: **None**

Description: Execute a partial cut of the paper.

Notes: This command is supported by some printer models but will not be supported by future printermodels. GS V is recommended for cutting paper. GS V <Function A> gives the same result as this command.

● See GS V <Function A> for details.

● The cutting shape depends on the specification of the mounted autocutter.

(31)

● ESC p m t1 t2 Specify cash drawer impulse

Format: ASCII ESC p m t1 t2

Hex 1B 70 m t1 t2

Decimal 27 112 m t1 t2

Range: m = 0，48，1，49

$0 \le t1 \le 255$

$0 \le t2 \le 255$

● Drawer kick on time is set to [t1*2] millisecond; off time is set to [t2*2] millisecond.

● When t2 < t1, the value of t2 is processed as t2=t1..

● If t2 <50, its value is supposed to be 50.

(32)

● ESC t n Select character code table

Format: ASCII ESC t n

Hex 1B 74 n

Decimal 27 116 n

Range: $0 \le n \le 255$

Initial Value: n=0

Function: Select page n of the character code table.

n	Character Type
0	PC347(U.S.A)
3	PC860(Portuguese)
4	PC863(Canada-French)
5	PC865(Nordic)
7	(Spanish)
8	PC857(Turkey)
10	(Farsi)
14	PC864(Arabic)
18	PC852 (Latin2)
20	PC737(Greek)
22	PC864 (Arabic)

25	WPC1254(Turkey)
27	(Vietnam)
32	WPC1255(Israel)
33	Rumania
59	PC866 (Cyrillic #2)
61	PC857(Turkey)
68	(Armenia)

(33)

● ESC {   Turn upside-down printing mode on/off

Format: ASCⅡ   ESC   {   n

　　　　　 Decimal   27   123   n

　　　　　 Hex   1B   7B   n

Range: 0≤n≤255

ESC { n turns upside-down printing mode on or off. When the LSB (least significant bit) of n is 1, upside-down printing mode is turned on; when it is 0, upside-down printing mode is turned off. The default setting is n=0. When upside-down mode is turned on, the printer prints 180°-rotated characters from right to left. The line printing order is not reversed; therefore, be careful of the order of the data transmitted. In standard mode, this command is enabled only when processed at the beginning of a line. In page mode, an internal flag is activated and this command is enabled when the printer returns to standard mode.

(34)

● FS ! n   Set Chinese characters printing mode compages

Format: ASCII   FS   !   n

　　　　　 Decimal   28   33   n

　　　　　 Hex   1C   21   n

Range: 0≤n≤255

Set the parameter n of Chinese characters printing mode as follows:

Digit	0/1	Hex	Decimal	Function
0, 1		—	—	Undefined.
2	0	00	0	Double-width mode not selected.
	1	04	4	Double-width mode selected.
3	0	00	0	Double-height mode not selected.
	1	08	8	Double-height mode selected.
4-6		--	--	Undefined.
7	0	00	0	Underline not selected.
	1	128	80	Underline selected.

(35)

● FS S n1 n2   Set Chinese character space amount

Format: ASCII   FS   S   n1   n2

　　　　　 Decimal   28   83   n1   n2

　　　　　 Hex   1C   53   n1   n2

Range: 0≤n1≤255, 0≤n2≤255

Initial value: n1=0, n2=0

Description: 1. Sets the Chinese character space amount and right space amount.

2. Left space amount: n1 x (basic calculated pitch)

3. Right space amount: n2 x (basic calculated pitch)

Note:

● The space amount set by this command is the amount when using standard sized characters. When expanding characters more than double in the horizontal direction, the space amount is [set amount x horizontal direction magnification].

● Space amount can be set independently for both the standard and page modes.

● The basic calculated pitch is set by GSP (Set basic calculated pitch). Also, after setting the Chinese character space amount, it is not affected even if the basic calculated pitch is changed.

● If there are fractions in the result, correct to the minimum mechanical pitch and discard.

● Use the basic calculated pitch (x) for the horizontal direction in standard mode.

● In page mode, the basic calculated pitch that is used according to the starting point is shown below.

a. When the starting point is specified to be upper left or lower right by the ESC T command (Character print direction selection in page mode), the basic calculated pitch (x) for the horizontal direction is used.

b. When the starting point is specified to be upper right or lower left by the ESC T command, the basic calculated pitch (y) for the vertical direction is used.

c. The maximum value for the left or right space for Chinese characters is approximately 35.893 mm (255/180 inches). Specifications that exceed the maximum value are rounded off to that value.

Reference: GSP

(36)

● FS p n m   Print the bit image that download to flash

Format   ASCII   FS   p   n   m

Hex   1C   70   n   m

Decimal   28   112   n   m

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

Description: Using mode m to print bit image that download to flash.

m	Mode	Density of Vertical Direction Dots	Density of Horizontal Direction Dots
0, 48	Normal Mode	180DPI	180 DPI
1, 49	Double-wide Mode	180DPI	90 DPI
2, 50	Double-tall Mode	90 DPI	180 DPI
3, 51	Quadruple Mode	90 DPI	90 DPI

n specifies the bit image(defined by command FS q) number.

m specifies the bit-image mode.

Details:

✧ Flash bit image is a bit image defined in flash memory by FS q and printed by this command.

✧ This command is ignored when the bit image is undefined.

✧ This command is effective only when no data exists in the print buffer in standard mode.

✧ Excluding upside-down printing, print modes (emphasized printing, double printing, double wide, double tall, underlines, character sizes, black/white inverted printing and 90 degree clockwise rotation) are unaffected.

✧ If bit image specification is of a size that exceeds the print region, the data in the print region is targeted for printing, but the excessive data is not printed.

✧ This command feeds dots (for the height *n* of the NV bit image) in normal and double-width modes,

✧ and (for the height of the NV bit image n x 2) in double-height and quadruple modes, regardless of

◆ the line spacing specified by ESC 2 or ESC 3.

◆ After printing the bit image, this command sets the print line feed and processes the subsequent data as normal data.

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

(37)

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

Format	ASCII	FS	q	n	[xLxHyLyHd1...dk]1 ... [xLxHyLyHd1...dk] n
	Hex	1C	71	n	[xLxHyLyHd1...dk]1 ... [xLxHyLyHd1...dk] n
	Decimal	28	113	n	[xLxHyLyHd1...dk]1 ... [xLxHyLyHd1...dk] n

Range:

$1 \leq n \leq 255$

$0 \leq xL \leq 255$

$1 \leq (xL+xH \times 256) \leq 1023$

$1 \leq (yL+yH \times 256) \leq 288$

$0 \leq d \leq 255$

$k = (xL+xH \times 256) \times (yL+yH \times 256) \times 8$

The maximum capacity that downloads to NV is 8096 bytes.

Descriptions: Defines the specified flash bit image.

◆ n specifies the number of NV bit images to define.

◆ xL and xH specify the horizontal direction for one NV bit image (xL + xH x 256) x 8 dots.

◆ yL and yH specify the vertical direction for one NV bit image (yL + yH x 256) x 8 dots.

Notes:

● There is the potential of damaging the non-volatile memory by overusing the command, so only use this command once a day to write to the non-volatile memory.

● This command erases all previously defined NV bit images. The printer cannot redefine only one of several data definitions that had been defined before. Therefore, all data must be resent.

● The printer may enter a BUSY state while writing data to the non-volatile memory when using this command. While the printer is BUSY, the printer will stop receptions so data will not be received from the host (including real-time commands).

● NV bit image is a bit image defined by this command in non-volatile memory and is printed by the FS p (Print NV bit image) command.

● This command is effective only when processed at the top of the line when standard mode is being used.

● This command is effective when 7 bytes of FS to yH of the command are processed normally.

● When the amount of data exceeds the capacity left in the range defined by xL, xH, yL, yH, the printer only processes the data in the defined range.

● This command is invalid when processing an argument that is out of the defined range with the initial NV bit image data.

● The printer terminates processing of this command and starts writing data to the non-volatile memory if an argument out of the defined range is processed on the second and subsequent NV bit image data. This invalidates the NV bit image being defined (making it undefined), but the NV bit images prior to that are valid.

● d specifies defined data. Bits that correspond to the dots to print are 1, and the bits that correspond to the dots that are not printed are 0.

● An n number of NV bit images are defined in ascending order from 01H. Therefore, The first data of [xLxHyLyHd1.dk] is an NV bit image of the number 01H. The final data of [xLxHyLyHd1.dk] is the NV bit

image of the number n. This matches with the NV bit image number that is specified for NV bit image printing (by FS p).

- One NV bit image definition data is configured by [xL xH yL yH d1.dk]. Therefore, if defining only one NV bit image data, n = 1. The data of [xL xH yL yH d1.dk] is processed only once. This uses ([data: (xL + xH x 256) x (yL + yH x 256) x 8] + [Data: 4]) of non-volatile memory.
- The printer is in a BUSY state just prior to writing to the non-volatile memory.
- The sending of ASB status and detection of status are not possible while processing this command even when the ASB function is specified.
- When processing this command while defining a macro, the macro definition is terminated and the command commences with processing.
- NV bit images that have been defined are not initialized by the ESC @ (Initialize printer), a reset or by turning off the printer's power.
- This command only defines the NV bit image, but it does not print it. To print an NV bit image, use FS p (Print NV bit image).

Reference: FS p

Ex.:   For xL=64, xH=0, yL=96, yH=0

$(xL + xH \times 256) \times 8$ dots $=512$ dots

d97

d1   d49057

MSB

$(yL + yH \times 256) \times 8$ dots $=768$ dots

d2

d3

LSB

d96   d49152
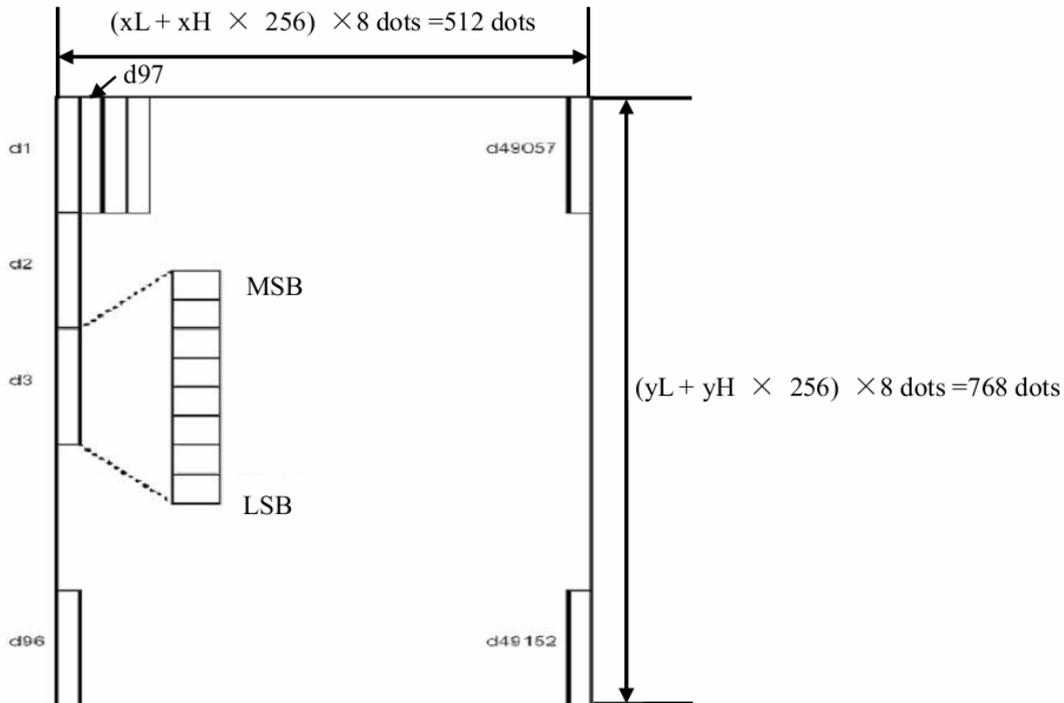
(38)

- **GS ! n   Select character size**

Format: ASCII   GS   !   n
                Hex   1D   21   n
                Decimal   29   33   n

Range: 0≤ n ≤ 255

GS ! n selects the character height using bits 0 to 3, and selects the character width using bits 4 to 7.

Character width selection is as follows:

Hex	Decimal	Width
00	0	1 (normal)

21

	10	16	2 (double-width)

Character height selection is as follows:

Hex	Decimal	Height
00	0	1 (normal)
01	1	2 (double-width)
02	2	3
03	3	4
04	4	5
05	5	6
06	6	7
07	7	8

Note:
- This command is effective for all characters (ANK and Chinese characters), excluding HRI characters.
- If the vertical and horizontal magnification ratios are outside the defined range, this command is ignored.
- In standard mode, the vertical direction is the paper feed direction; the horizontal direction traverses the paper feed direction. Therefore, when character orientation changes in 90 degree clockwise rotation mode, the relationship between vertical and horizontal directions is reversed.
- In page mode, vertical and horizontal directions are based on the character orientation.
- The base line for characters is the same when there are characters having different vertical direction ratios in the same line.
- The ESC ! (Batch specify print mode) command can also turn double-width and double-height modes on or off, but the setting of the last received command is effective.

Reference: ESC !

(39)
- GS $ nL nH   Specify absolute position for character vertical direction in page mode

Format:
ASCII   GS   !   nL   nH
Hex   1D   24   nL   nH
Decimal   29   36   nL   nH

Range: $0 \le nL \le 255$, $0 \le nH \le 255$

Description:

Specifies the character vertical direction position for the data expansion starting position using the absolute position based on the starting point in page mode. The position of the character vertical direction for the next data expansion starting position is the position specified by [(nL + nH x 256) x basic calculated pitch] from the starting point.

Note:
- When not in page mode, this command is ignored.
- Specifications for absolute positions that exceed the specified print range are ignored.
- The position of the character horizontal direction of the data expansion starting position does not move.
- The starting point that is used as a reference is specified by ESC T.
- The following operations occur depending on the starting point of (Selecting the character printing direction in page mode) ESC T.
  a. If the starting point is upper left or lower right, specify the absolution position for the paper feed direction (character vertical direction). Use the basic calculated pitch (y) for the horizontal direction at this time.

b. If the starting point is upper right or lower left, specify the absolution position for the paper feed in the vertical direction (character vertical direction). Use the basic calculated pitch (x) for the horizontal direction at this time.

- The basic calculated pitch is set by GSP (Set basic calculated pitch).
- If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.

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

(40)

- GS H n Select printing position of HRI characters

Format:	ASCII	GS	H	n
	Hex	1D	48	n
	Decimal	29	72	n

Range: $0 \leq n \leq 3$

$48 \leq n \leq 51$

GS H n selects the printing position for HRI characters when printing a bar code. n selects the printing position as follows:

The default setting is n=0. HRI characters are printed at the position specified by GS H.

(41)

- GS L nL nH Set left margin

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

Range: $0 \leq nL \leq 255, 0 \leq nH \leq 255$

Description:

1. nL and nH set the specified left margin.
2. The left margin is [(nL + nH x 256) x basic calculated pitch]
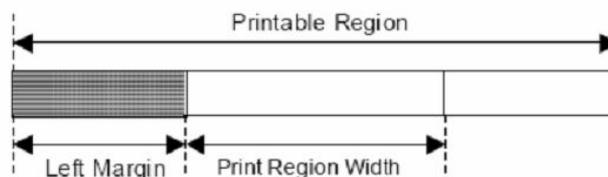
Note:

- This command is effective only when input at the top of the line when standard mode is being used.
- This command has no affect in page mode. This command is only effective for the setting.
- The maximum setting for the left margin is the same size as the printable region for the horizontal direction. Specifications that exceed the maximum value are rounded off to that value.
- The basic calculated pitch is set by GSP (Set basic calculated pitch). Also, after setting the left margin, it is not affected even if the basic calculated pitch is changed.
- Use the basic calculated pitch (x) for the horizontal direction of GS P (Set basic calculated pitch) to calculate the left margin. If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.

Reference: GS P, GS W

(42)

● **GS P x y**   Set basic calculated pitch

Format:

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

Range: $0 \leq x \leq 255$, $0 \leq y \leq 255$

Initial value: x = 180, y = 360: EPSON targeted model print head 180 DPI
                      x = 203, y = 203: EPSON targeted model print head 203 DPI

Description:

Sets the horizontal basic calculated pitch to approximately 25.4/xmm [(1/x) inch], and the vertical basic calculated pitch to approximately 25.4/ymm [(1/y) inch].

x = 0: Returns the horizontal basic calculated pitch to its default value.

y = 0: Returns the vertical basic calculated pitch to its default value.

Note:
- Horizontal direction refers to the vertical direction in reference to paper feed; Vertical direction refers to the direction of paper feed.
- With standard mode, use the parameters shown below regardless of the direction of the characters (upside down, or rotated 90 degrees).

   a. Commands using x: ESC SP, ESC $, ESC \, FSS, GSL, GSW

   b. Commands using y: ESC 3, ESC J, GSV
- With page mode, use the parameters shown below according to the direction of the characters.

   a. If the starting point is upper left or lower right using ESC T (Character print direction selection in page mode) (feeds paper and expands characters in the vertical direction):

   Commands using x: ESC SP, ESC $, ESCW, ESC \, FSS

   Commands using y: ESC3, ESCJ, ESCW, GS$, GS\, GSV

   b. If the starting point is upper right or lower left using ESC T (Character print direction selection in page mode) (expands characters in the paper feed direction):

   Commands using x: ESC 3, ESC J, ESCW, GS $, GS \

   Commands using y: ESC SP, ESC $, ESCW, ESC \, FSS, GSV
- This command has no affect on any previously set setting values.
- If the calculation combining other commands results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.

**Reference:** ESC SP, ESC $, ESC 3, ESC J, ESC W, ESC \, GS $, GS L, GS V, GS W, GS \

(43)

● ①GS V m ②GS V m n   Select paper-cut mode and cutting paper

Format:　①ASCII　　　GS　　　V　　　m

Hex　　　　1D　　　56　　　m

Decimal　　29　　　86　　　m

②ASCII　　　GS　　　V　　　m　　n

Hex　　　　1D　　　56　　　m　　n

Decimal　29　　　　86　　　m　　n

Range:　① m = 0，48，1，49

② m =65，66，　0 ≤n ≤255

Paper-cut

M	Paper-cut mode
0, 48	Full-cut
1, 49	Partial-cut
65,66	Feed paper ([n* (lengthways moving unit) inch]) and partial-cut

- m = 0, 48, 1, 49, cutting paper directly.
- m= 65, 66, feeding paper [the distance between printing position and the paper cutter + n*(lengthways moving unit)], and then cutting paper.
- Measuring the formfeed distance by lengthways moving unit

(44)

- GS　\　nL nH　　　Specify relative position for character vertical direction in page mode

Format:　ASCII　　GS　　\　　nL　　nH

Hex　　　1D　　5C　　nL　　nH

Decimal　29　　92　　nL　　nH

Range:　0≤ nL ≤ 255, 0≤ nH ≤ 255

Description:

Specifies the character vertical direction position for the data expansion starting position using the relative position based on the current point in page mode. This sets the position moved from the current position to [(nL + nH x 256) x basic calculated pitch] for the next data expanding starting position.

Note:

- When not in page mode, this command is ignored.
- If the direction below the current position is specified for the characters, specify a positive number; if the direction above is specified, a negative number is used.
- Negative numbers are represented by the complement of 65536. For example, when moving in the upward direction N pitches, use: $nL + nH \times 256 = 65536-N$
- Specifications for relative positions that exceed the specified print region are ignored.
- The following operations occur depending on ESC T (Selecting the character printing direction in page mode).
  a. If the starting point is upper left or lower right, specify the relative position for the paper feed direction. Use the basic calculated pitch (y) for the horizontal direction at this time.
  b. If the starting point is upper right or lower left, specify the relative position for the paper feed in the vertical direction. Use the basic calculated pitch (x) for the horizontal direction at this time.
- The basic calculated pitch is set by GSP (Set basic calculated pitch).
- If the calculation results in fractions, the pitch is corrected to a minimal mechanical pitch and the rest is discarded.

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

(45)

●   GS h n   Set bar code height

Format: ASCII   GS   h   n

           Hex   1D   68   n

           Decimal   29   104   n

Range: $1 \leq n \leq 255$

GS h n selects the height of a bar code. n specifies the number of dots in the vertical direction. One dot corresponds to 1/180 inch. The default setting is n=162.

> Program Example
> PRINT #1,CHR$(&H1D);"h";CHR$(50);Set height to 50
>   PRINT #1,CHR$(&H1D);"k";CHR$(2);Print bar code
>   PRINT #1,"496595707379";CHR$(0);
>   PRINT #1,CHR$(&HA);
> PRINT #1,CHR$(&H1D);"h";CHR$(100);Set height to 100
>   PRINT #1,CHR$(&H1D);"k";CHR$(2);Print bar code
>   PRINT #1,"496595707379";CHR$(0);
>   PRINT #1,CHR$(&HA);

> Print Sample
>
> Height: 50 dots
>
> Height: 100 dots
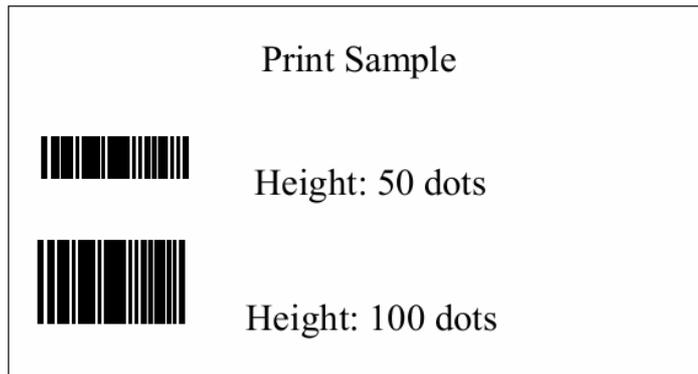
(46)

●   **GS k m d1 ... dk NUL**   **GS k m n d1 ... dn**   Print bar code

Format: ①ASCII   GS   k   m d1 ... dk NUL

             Hex   1D   6B   m d1 ... dk 00

             Decimal   29   107   m d1 ... dk 0

             ②ASCII   GS   k   m n d1 ... dn

             Hex   1D   6B   m n d1 ... dn

             Decimal   29   107   m n d1 ... dn

Range: ①$0 \leq m \leq 6$ (k and d depend on the bar code system used)

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

①GS k m d1 ... dk NUL and ②GS k m n d1 ... dn select a bar code system and print the bar code.

m specifies a bar code system as follows:

m		Bar Code System	Number of Characters	Remarks
①	0	UPC-A	$11 \le k \le 12$	$48 \le d \le 57$
	1	UPC-E	$11 \le k \le 12$	$48 \le d \le 57$
	2	JAN13 (EAN13)	$12 \le k \le 13$	$48 \le d \le 57$
	3	JAN 8 (EAN8)	$7 \le k \le 8$	$48 \le d \le 57$
	4	CODE39	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37, 43, 45, 46, 47
	5	ITF	$1 \le k$ (even number)	$48 \le d \le 57$
	6	CODABAR	$1 \le k$	$48 \le d \le 57$, $65 \le d \le 68$, 36, 43, 45, 46, 47, 58
②	65	UPC-A	$11 \le n \le 12$	$48 \le d \le 57$
	66	UPC-E	$11 \le n \le 12$	$48 \le d \le 57$
	67	JAN13 (EAN13)	$12 \le n \le 13$	$48 \le d \le 57$
	68	JAN 8 (EAN8)	$7 \le n \le 8$	$48 \le d \le 57$
	69	CODE39	$1 \le n \le 255$	$48 \le d \le 57$, $65 \le d \le 90$, 32, 36, 37, 43, 45, 46, 47
	70	ITF	$1 \le n \le 255$ (even number)	$48 \le d \le 57$
	71	CODABAR	$1 \le n \le 255$	$48 \le d \le 57$, $65 \le d \le 68$, 36, 43, 45, 46, 47, 58
	72	CODE93	$1 \le n \le 255$	$0 \le d \le 127$
	73	CODE128	$2 \le n \le 255$	$0 \le d \le 127$

Note:

For ①

- This command ends with a NUL code.
- When the bar code system used is UPC-A or UPC-E, the printer prints the bar code data after receiving 12 bytes bar code data and processes the following data as normal data.
- When the bar code system used is JAN13 (EAN13), the printer prints the bar code after receiving 13 bytes bar code data and processes the following data as normal data.
- When the bar code system used is JAN8 (EAN8), the printer prints the bar code after receiving 8 bytes bar code data and processes the following data as normal data.
- The number of data for ITF bar code must be even numbers. When an odd number of data is input, the printer ignores the last received data.

For ②:

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

When in standard mode:

- If d is outside of the specified range, the printer only feeds paper and processes the following data as normal data.
- If the horizontal size exceeds printing area, the printer only feeds the paper.
- This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by ESC 2 or ESC 3.

- This command is enabled only when no data exists in the print buffer. When data exists in the print buffer, the printer processes the data following m as normal data.
- After printing bar code, this command sets the print position to the beginning of the line.
- This command is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° rotated character, etc.), except for upside-down printing mode.

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

When CODE93 (*m* = 72) is used:
- The printer prints an HRI character (□) as start character at the beginning of the HRI character string.
- The printer prints an HRI character (□) as a stop character at the end of the HRI character string.
- The printer prints HRI characters (■ + an alphabetic character) as a control character (<00>H to <1F>H and <7F>H):

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

[Example] Printing **GS k** 72 7 67 111 100 101 13 57 51

When CODE128 (m = 73) is used:

● Refer to Appendix J for the information of the CODE 128 bar code and its code table.

● When using the CODE 128 in this printer, take the following points into account for data transmission:

The top of the bar code data string must be code set selection character (any of CODE A, CODE B or CODE C) which selects the first code set.

Special characters are defined by combining two characters "{" and one character. The ASCII character "{" is defined by transmitting "{" twice consecutively.

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

[Example] Example data for printing "No. 123456"

In this example, the printer first prints "No." using CODE B, then prints the following numbers using CODE C.

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

● If the top of the bar code data is not the code set selection character, the printer stops command processing and processes the following data as normal data.

● If combination of "{" and the following character does not apply any special character, the printer stops command processing and processes the following data as normal data.

● If the printer receives characters that cannot be used in the special code set, the printer stops command processing and processes the following data as normal data.

● The printer does not print HRI characters that correspond to the shift characters or code set selection characters.

● HRI character for the function character is space.

● HRI characters for the control character (<00>H to <1F>H and <7F>H) are space.

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

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

(47) GS (k   **Set up and print the symbol**

   1)   **GS (k <Function 1>**   **Select the model**

[Format]   ASCII   GS (k pL pH cn fn n1 n2

               Hex   1D 28 6B 04 00 31 41 n1 n2

               Decimal 29 40 107 4 0 49 65 n1 n2

[Range]   (pL + pH *256) = 4 (pL = 4, pH = 0)

               cn = 49

               fn = 65

               n1 = 49, 50

               n2 = 0

[Default]   n1 = 50, n2 = 0

[Description] Selects the model for QR Code.

n1	Function
49	Selects model 1.
50	Selects model 2.

[Notes]   ■Settings of this function are effective until **ESC @** is executed, the printer is reset, or the power is turned off.

   2)   **GS (k <Function 2>**   **Set the size of module**

[Format]   ASCII GS (k pL pH cn fn n

               Hex 1D 28 6B 03 00 31 43 n

               Decimal 29 40 107 3 0 49 67 n

[Range]   (pL + pH *256) = 3 (pL = 3, pH = 0)

               cn = 49

               fn = 67

               $1 \leq n \leq 16$

[Default]   n = 3

[Description] Sets the size of the module for QR Code to n dots.

[Notes]   ■Settings of this function affect the processing of Functions 5 and 6.

               ■Settings of this function are effective until ESC @ is executed, the printer is reset, or the power is turned off.

               ■n = width of a module = height of a module. (Because the QR code modules are square.)

   3)   **GS (k <Function 3>**   **Select the error correction level**

[Format]   ASCII GS (k pL pH cn fn n

               Hex 1D 28 6B 03 00 31 45 n

               Decimal 29 40 107 3 0 49 69 n

[Range]   (pL + pH *256) = 3 (pL = 3, pH =0)

               cn = 49

               fn = 69

               $48 \leq n \leq 51$

[Default]   n = 48

[Description]   Selects the error correction level for QR Code.

n	Function	Recovery Capacity % (approx.)
48	Selects Error correction level L	7
49	Selects Error correction level M	15
50	Selects Error correction level Q	25
51	Selects Error correction level H	30

[Notes] ■Settings of this function affect the processing of Functions 5 and 6.

■QR Code employs Reed-Solomon error correction to generate a series of error correction codewords.

■Settings of this function are effective until **ESC @** is executed, the printer is reset, or the power is turned off.

4) GS (k <Function 4>   **Store the data in the symbol storage area**

[Format]   ASCII GS (k pL pH cn fn m d1...dk

              Hex 1D 28 6B pL pH 31 50 30 d1...dk

              Decimal 29 40 107 pL pH 49 80 48 d1...dk

[Range] $4 \le (pL + pH * 256) \le 1023$ $(0 \le pL \le 255, 0 \le pH \le 3)$

              cn = 49

              fn = 80

              m = 48

              $0 \le d \le 255$

              $k = (pL + pH * 256) - 3$

[Description] Stores the QR Code symbol data (d1...dk) in the symbol storage area.

[Notes]   ■k bytes of d1...dk are processed as symbol data.

■It is possible to encode to a QR Code as follows. Be sure not to include anything except the following data in the data d1...dk.

Category of data	Characters it is possible to specify
Numerical Mode data	"0" ~ "9"
Alphanumeric Mode data	"0" ~ "9", "A" ~ "Z", SP, $, %, *, +, −, . , /, :
Kanji Mode data	Shift JIS value (Shift value from JISX0208)
8-Bit Byte Mode data	00H ~ FFH

■Settings of this function are effective until the following processing is performed:

     • **ESC @** is executed

     • The printer is reset or the power is turned off

5) GS (k <Function 5>   **Print the symbol data in the symbol storage area**

[Format]   ASCII GS (k **pL pH cn fn m**

              Hex 1D 28 6B **03 00 31 51 m**

              Decimal 29 40 107 **3 0 49 81 m**

[Range]   **(pL + pH*256) = 3 (pL = 3, pH = 0)**

              cn = 49

              fn = 81

              m = 48

[Description] Encodes and prints the QR Code symbol data in the symbol storage area using the process of <Function 4>.

[Notes] ■In standard mode, use this function when printer is "at the beginning of a line," or "there is no data in the print buffer."

■The symbol size that exceeds the print area cannot be printed.

■If there is any error described below in the data of the symbol storage area, it cannot be printed.

• There is no data (Function 4 is not processed).

• If the data of the symbol storage area is more than the data allowed by specified model and data compaction mode. (This case is an abnormal number of data.)

• The four data compaction modes are listed below (in order of compaction rate). Automatically selects best compaction mode by the data of the symbol storage area.

– Numerical mode

– Alphanumeric mode

– Kanji mode

– 8-Bit Byte Mode

■The following data are added automatically by the encode processing.

• Position Detection Patterns

• Separators for Position Detection Patterns

• Timing Patterns

• Format Information

• Version Information

• Error Correction codewords (employs the Reed-Solomon Error Detection and Correction algorithm)

• Pad codeword

• Number of bits in Character Count Indicator

• Mode Indicator

• Terminator

• Alignment Patterns (when model 2 is selected)

• Extension Patterns (when model 1 is selected)

■Printing of symbol is not affected by print mode (emphasized, double-strike, underline, white/ black reverse printing, or 90° clockwise-rotated), except for character size and upside-down print mode.

■In standard mode, this command executes paper feeding for the amount needed for printing the symbol, regardless of the paper feed amount set by the paper feed setting command. The print position returns to the left side of the printable area after printing the symbol, and printer is in the status "beginning of the line," or "there is no data in the print buffer."

■In page mode, the printer stores the symbol data in the print buffer without executing actual printing. The printer moves print position to the next dot of the last data of the symbol.

■The quiet zone is not included in the printing data. Be sure to include the quiet zone when using this function.

6) **GS (k <Function 6> Transmit the size information of the symbol data in the symbol storage area**

[Format]   ASCII GS (k **pL pH cn fn m**

Hex 1D 28 6B **03 00 31 52 m**

Decimal 29 40 107 **3 0 49 82 m**

[Range]   **(pL + pH *256) = 3 (pL = 3, pH =0)**

cn = 49

fn = 82

m = 48

[Description]   Transmits the size information for the encoded QR Code symbol data in the symbol storage area
using the process of <Function 4>.

[Notes]   ■In standard mode, use this function when the printer is "at the beginning of a line," or "there is no
data in the print buffer."

■The size information for each data is as follows;

Send data	Hex	Decimal	Data
Header	37H	55	1 byte
Identifier	36H	54	1 byte
Horizontal size(*1)	30H –39H	48 –57	1 –5 byte
Separator	1FH	31	1 byte
Vertical size(*1)	30H –39H	48 –57	1 –5 byte
Separator	1FH	31	1 byte
Fixed value	31H	49	1 byte
Separator	1FH	31	1 byte
Other information(*2)	30H or 31H	48 or 49	1 byte
NUL	00H	0	1 byte

(*1)"Horizontal size" and "vertical size" indicate the number of dots of the symbol. The decimal
value of the vertical size and horizontal size is converted to text data and sent starting from the high
order end.

(ex: When horizontal size is 120 dots, horizontal size is "120" (in hexadecimal: 31H, 32H, and 30H
/ in decimal: 49, 50, and 48), which is 3 bytes of data.)

(*2)"Other information" indicates whether printing of the data in the symbol storage area is
possible or impossible. The "Other information" is the following.

Other information

Hex	Decimal	Condition
30H	48	Printing is possible
31H	49	Printing is impossible

■Size information indicates size of symbol that is printed by Function 5.

■The quiet zone is not included in the size information.

■If "other information" is "Printing is impossible"(in decimal: 49), use one of the solutions
shown below.

Cause	Solution
There are data in the print buffer in the standard mode	Put the printer in the "there is no data in the print buffer" status by executing **GS T** or print commands (**LF, CR, ESC J**).
Symbol is bigger than the current print area.	Expand the print area by **GS W, ESC W, ESC $**. Reduce the module size by Function 167. Lower the error correction level by Function 169.
The data in the symbol storage area is too large.	Send correct data by Function 180. Select other model by Function 165. Lower the error correction level by Function 169.
There is no data in the symbol storage area.	Send data to the symbol storage area by Function 180.

■See previous [Notes for transmission process] for process sending data group.

(48)

● GS   v   0   m   xL   xH   yL   yH   d1...dk   Print raster graphic

    Format: ASCII   GS   v   0   m   xL   xH   yL   yH   d1...dk

           Hex   1D 76 30 m xL xH yL yH d1...dk

           Decimal 29 118 48 m xL xH yL yH d1...dk

    Range: m=0

         $0 \le xL \le 27$

         xH=0

         yL=24

         yH=0

         $0 \le d \le 5$

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

✧ xL and xH specify the horizontal direction data count for one bit image (xL + xH x 256) in bytes.

✧ yL and yH specify the vertical direction data count for one bit image (yL + yH x 256) in bytes.

E.g. when $xL + xH \times 256 = 64$
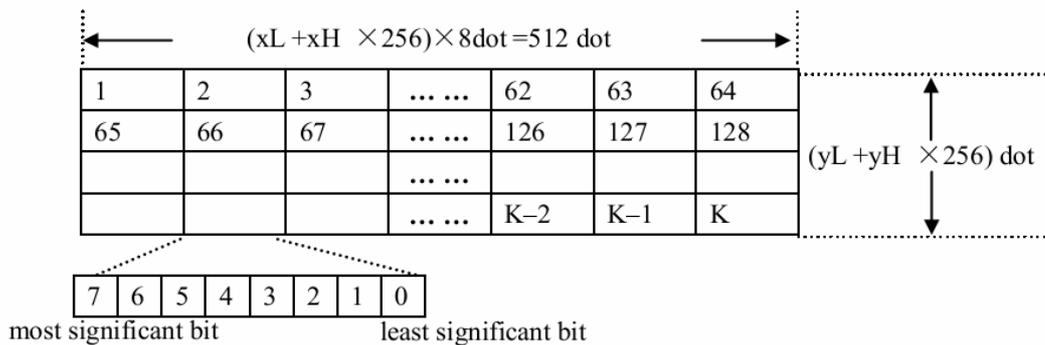
(49)

● GS w n   Set bar code width

    Format: ASCII   GS   w   n

                 Hex   1D   77   n

                 Decimal   29   119   n

    Range: $2 \le n \le 6$

  GS w n selects the horizontal size of a bar code. n specifies the bar code width as shown below. The

multilevel bar codes are UPC-A, UPC-E, JAN13 (EAN13), JAN8 (EAN8), CODE93, and CODE128. The binary level bar codes are CODE39, ITF, and CODABAR. The default setting is n=3.

n	Module Width (mm) for Multilevel Bar Code	Binary Level Bar Code	
		Thin Element Width (mm)	Thick Element Width (mm)
2	0.282	0.282	0.706
3	0.423	0.423	1.129
4	0.564	0.564	1.411
5	0.706	0.706	1.834
6	0.847	0.847	2.258

```
Program Example
PRINT #1,CHR$(&H1D);"w";CHR$(3);Set width size to 3
PRINT #1,CHR$(&H1D);"k";CHR$(2);Print bar code
PRINT #1,"496595707379";CHR$(0);
PRINT #1,CHR$(&HA);
PRINT #1,CHR$(&H1D);"w";CHR$(4);Set width size to 4
PRINT #1,CHR$(&H1D);"k";CHR$(2);Print bar code
PRINT #1,"496595707379";CHR$(0);
PRINT #1,CHR$(&HA);
PRINT #1,CHR$(&H1D);"w";CHR$(5);Set width size to 5
PRINT #1,CHR$(&H1D);"k";CHR$(2);Print bar code
PRINT #1,"496595707379";CHR$(0);
PRINT #1,CHR$(&HA);
```
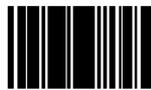
Print Sample

Width size 3

Width size 4

Width size 5

2 COMMAND SAMPLE (hex command)

1d 68 64 1d 6b 02 34 39 36 35 39 35 37 30 37 33 37 39 00 0a
   //print a barcode width 1, height 100
1d 77 02 1d 6b 02 34 39 36 35 39 35 37 30 37 33 37 39 00 0a
   // print a barcode width 2, height 100
1d 77 02 1d 6b 02 32 32 30 30 30 30 32 30 30 30 35 30 35 00 0a
     // print EAN-13 barcode
1d 6b 00 30 30 30 30 30 30 30 30 30 30 30 00 0a
     //print UPC-A barcode
1d 6b 03 30 30 30 30 30 30 30 00 0a
     //print EAN-8 barcode
1d 6b 04 30 30 30 30 30 30 30 30 30 30 30 30 30 00 0a
   // CODE39
1d 68 64 1d 48 03 1d 6b 04 30 30 30 30 30 30 30 30 30 30 30 30 30 00 0a
   //set the position of digits on the barcode

3 APPENDIX: CODE128 BAR CODE

3.1 Description of the CODE128 Bar Code

In CODE128 bar code system, it is possible to represent 128 ASCII characters and 2-digit numerals using one bar code character that is defined by combining one of the 103 bar code characters and 3 code sets. Each code set is used for representing the following characters:

● Code set A: ASCII characters 00H to 5FH
● Code set B: ASCII characters 20H to 7FH
● Code set C: 2-digit numeral characters using one character (100 numerals from 00 to 99)
   The following special characters are also available in CODE128:
● SHIFT characters
   In code set A, the character just after SHIFT is processed as a character for code set B. In code set B, the character just after SHIFT is processed as the character for code set A. SHIFT characters cannot be used in code set C.
● Code set selection character (CODE A, CODE B, CODE C)
● This character switches the following code set to code set A, B, or C.
● Function character (FNC1, FNC2, FNC3, FNC4)
● The usage of function characters depends on the application software. In code set C, only FNC1 is available.

3.2 Code Tables

Printable characters in code set A.

Character	Transmit Data Hex	Transmit Data Decimal	Character	Transmit Data Hex	Transmit Data Decimal	Character	Transmit Data Hex	Transmit Data Decimal
NUL	00	0	(	28	40	P	50	80
SOH	01	1	)	29	41	Q	51	81
STX	02	2	*	2A	42	R	52	82
ETX	03	3	+	2B	43	S	53	83
EOT	04	4	,	2C	44	T	54	84
ENQ	05	5	-	2D	45	U	55	85
ACK	06	6	.	2E	46	V	56	86
BEL	07	7	/	2F	47	W	57	87
BS	08	8	0	30	48	X	58	88
HT	09	9	1	31	49	Y	59	89
LF	0A	10	2	32	50	Z	5A	90
VT	0B	11	3	33	51	[	5B	91
FF	0C	12	4	34	52	\	5C	92
CR	0D	13	5	35	53	]	5D	93
SO	0E	14	6	36	54	^	5E	94
SI	0F	15	7	37	55	_	5F	95
DLE	10	16	8	38	56	FNC1	7B,31	123,49
DC1	11	17	9	39	57	FNC2	7B,32	123,50
DC2	12	18	:	3A	58	FNC3	7B,33	123,51
DC3	13	19	;	3B	59	FNC4	7B,34	123,52
DC4	14	20	<	3C	60	SHIFT	7B,53	123,83
NAK	15	21	=	3D	61	CODE B	7B,42	123,66
SYN	16	22	>	3E	62	CODE C	7B,43	123,67
ETB	17	23	?	3F	63			
CAN	18	24	@	40	64			
EM	19	25	A	41	65			
SUB	1A	26	B	42	66			
ESC	1B	27	C	43	67			
FS	1C	28	D	44	68			
GS	1D	29	E	45	69			
RS	1E	30	F	46	70			
US	1F	31	G	47	71			
SP	20	32	H	48	72			
!	21	33	I	49	73			
"	22	34	J	4A	74			
#	23	35	K	4B	75			
$	24	36	L	4C	76			
%	25	37	M	4D	77			
&	26	38	N	4E	78			
'	27	39	O	4F	79			

![Urano]

Printable characters in code set B.

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
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	FNC1	7B,31	123,49
1	31	49	Y	59	89	FNC2	7B,32	123,50
2	32	50	Z	5A	90	FNC3	7B,33	123,51
3	33	51	[	5B	91	FNC4	7B,34	123,52
4	34	52	\	5C	92	SHIFT	7B,53	123,83
5	35	53	]	5D	93	CODE A	7B,41	123,66
6	36	54	^	5E	94	CODE C	7B,43	123,67
7	37	55	_	5F	95			
8	38	56	`	60	96			
9	39	57	a	61	97			
:	3A	58	b	62	98			
;	3B	59	c	63	99			
<	3C	60	d	64	100			
=	3D	61	e	65	101			
>	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			

Printable characters in code set C.

Character	Transmit Data		Character	Transmit Data		Character	Transmit Data	
	Hex	Decimal		Hex	Decimal		Hex	Decimal
00	00	0	40	28	40	80	50	80
01	01	1	41	29	41	81	51	81
02	02	2	42	2A	42	82	52	82
03	03	3	43	2B	43	83	53	83
04	04	4	44	2C	44	84	54	84
05	05	5	45	2D	45	85	55	85
06	06	6	46	2E	46	86	56	86
07	07	7	47	2F	47	87	57	87
08	08	8	48	30	48	88	58	88
09	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	FNC1	7B,31	123,49
21	15	21	61	3D	61	CODE A	7B,41	123,65
22	16	22	62	3E	62	CODE B	7B,42	123,66
23	17	23	63	3F	63			
24	18	24	64	40	64			
25	19	25	65	41	65			
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			