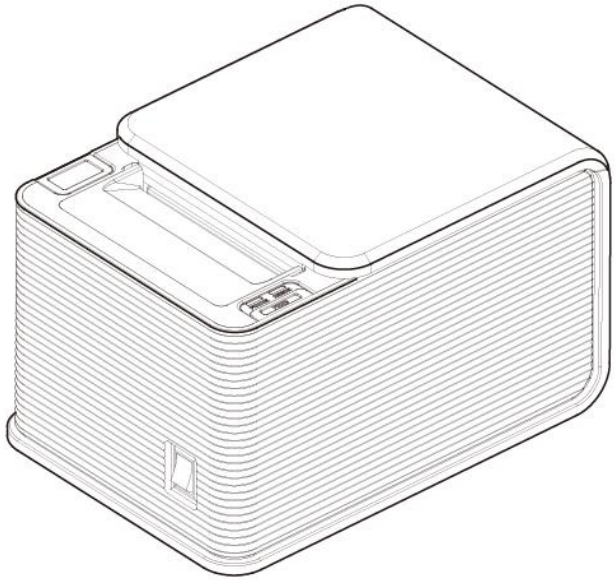
A10plus Receipt Printer

Command Reference Manual
Rev. 1.50



1. Control Commands List

Command	Hex. codes	Function	Function type	Classfication	
				Executing Cmds	Setting Cmds
<HT>	09	Horizontal tab	Print position	○	
<LF>	0A	Print and line feed	Print	○	
<FF>	0C	Print and return to standard mode (in page mode)	Print	○	
<CR>	0D	Print and carriage return	Print	○	
<CAN>	18	Cancel print data in page mode	Character	○	
<DLE> <EOT>	10 04 n	Transmit real-time status	Status	○	
<SYN>	16 n	Turn melody on/off	Miscellaneous function	○	
<ESC> <FF>	1B 0C	Print data in page mode	Print	○	
<ESC> <SP>	1B 20 n	Set right-side character spacing	Character		○
<ESC> !	1B 21 n	Select print mode(s)	Character		○
<ESC> $	1B 24 nL nH	Set absolute print position	Print position	○	
<ESC> %	1B 25 n	Select/cancel user-defined character set	Character		○
<ESC> &	1B 26 y c1 c2	Define user-defined characters	Character		○
<ESC> *	1B 2A m nL nH	Select bit-image mode	Bit image	○	
<ESC> -	1B 2D n	Turn underline mode on/off	Character		○
<ESC> 2	1B 32	Select default line spacing	Line spacing		○
<ESC> 3	1B 33 n	Set line spacing	Line spacing		○
<ESC> =	1B 3D n	Select peripheral device	Miscellaneous function		○
<ESC> ?	1B 3F n	Cancel user-defined characters	Character		○
<ESC> @	1B 40	Initialize printer	Miscellaneous function	○	○
<ESC> D	1B 44 … 00	Set horizontal tab positions	Print position		○
<ESC> E	1B 45 n	Turn emphasized mode on/off	Character		○
<ESC> G	1B 47 n	Turn double-strike mode on/off	Character		○

<ESC> J	1B 4A n	Print and feed paper	Print	○	
<ESC> L	1B 4C	Select page mode	Miscellaneous function	○	
<ESC> M	1B 4D n	Select character fonts	Character		○
<ESC> R	1B 52 n	Select an international character set	Character		○
<ESC> S	1B 53	Select standard mode	Miscellaneous function	○	
<ESC> T	1B 54 n	Select print direction in page mode	Print position		○
<ESC> V	1B 56 n	Turn 90° clockwise rotation mode on/off	Character		○
<ESC> W	1B 57	Set print area in page mode	Print position		○
<ESC> \	1B 5C n	Set relative print position	Print position	○	
<ESC> a	1B 61 n	Select justification	Print position		○
<ESC> d	1B 64 n	Print and feed n lines	Print	○	
<ESC> i	1B 69	Partial cut (one point left uncut)	Mechanism control	○	
<ESC> m	1B 6D	Partial cut (three points left uncut)	Mechanism control	○	
<ESC> p	1B 70 m t1 t2	Generate pulse	Miscellaneous function	○	
<ESC> t	1B 74	Select character code table	Character		○
<ESC> {	1B 7B n	Turn upside-down print mode on/off	Character		○
<FS> p	1C 70 n m	Print NV bit image	Bit image	○	
<FS> q	1C 71 n …	Define NV bit image	Bit image		○
<GS> !	1D 21 n	Select character size	Character		○
<GS> $	1D 24 nL nH	Set absolute vertical print position in page mode	Print position	○	
<GS> (k	1D 28 6B …	QR Code printing control	Miscellaneous Commands	○	
<GS> *	1D 2A x y …..	Define downloaded bit image	Bit image		○
<GS> /	1D 2F n	Print downloaded bit image	Bit image	○	
<GS> B	1D 42 n	Turn white/black reverse print mode on/off	Character		○
<GS> H	1D 48 n	Select print position of HRI characters	Bar code		○
<GS> I	1D 49 n	Transmit printer ID.	Status		○
<GS> L	1D 4C nL nH	Set left margin	Print position		○

<GS> P	1D 50 x y	Set horizontal and vertical motion units	Miscellaneous function		○
<GS> V	1D 56 m 1D 56 m n	Select cut mode and cut paper	Mechanism control	○	
<GS> W	1D 57 nL nH	Set print area width	Print position		○
<GS> \	1D 5C nL nH	Set relative vertical print position in page mode	Print position	○	
<GS> a	1D 61 n	Enable/Disable Automatic status back(ASB)	Status	○	
<GS> f	1D 66 n	Select font for HRI characters	Bar code	○	
<GS> h	1D 68 n	Set bar code height	Bar code	○	
<GS> k	1D 6B m … NUL 1D 6B m n …	Print bar code	Bar code	○	
<GS> r	1D 72 n	Transmit status	Status	○	
<GS> v	1D 76 30	Print raster bit image	Bit image	○	
<GS> w	1D 77 n	Set bar code width	Bar code	○	
Black Mark Function Command					
<FF>	0C	Print and recover to page mode	Black Mark	○	
<GS> <FF>	1D 0C	Top of form of mark paper	Black Mark	○	
<GS> V	1D 56 m 1D 56 m n	Paper Cut Position Feed	Black Mark	○	
<GS> <	1D 3C	Mechanically initialize printer	Black Mark	○	
<GS> A	1D 41 m n	Marked Paper Form Feed Position Correct	Black Mark	○	
<GS> (F	1D 28 46 pL pH a m nL nH	Set black mark adjustment value	Black Mark	○	
<GS> (M	1D 28 4D pL pH n m	Save black mark adjustment value. Load black mark adjustment value. Set black mark adjustment value auto-load when powering on.	Black Mark	○	

2. Control Command Details

Command	Description
HT	[Name] Horizontal tab [Format] ASCII HT Hex 09 Decimal 9 [Range] None [Default] None [Printers not featuring this command] None [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. ■ Horizontal tab positions are set by **ESC D**. ■ If the next horizontal tab position exceeds the print area, the printer sets the print position to [Print area width + 1]. ■ If this command is processed when the print position is at [Print area width + 1], the printer executes print buffer-full printing of the current line and horizontal tab processing from the beginning of the next line. In this case, in page mode, the printer does not execute printing, but the print position is moved. ■ When underline mode is turned on, the underline will not be printed under the tab space skipped by this command.

LF	[Name] Print and line feed [Format] ASCII LF Hex 0A Decimal 10 [Range] None [Default] None [Printers not featuring this command] None [Description] Prints the data in the print buffer and feeds one line, based on the current line spacing. [Notes] ■ The amount of paper fed per line is based on the value set using the line spacing command (**ESC 2** or **ESC 3**). ■ After printing, the print position moves to the beginning of the line. When a left margin is set in standard mode, the position of the left margin is the beginning of the line. ■ When this command is processed in page mode, only the print position moves, and the printer does not perform actual printing.

FF(page)	[Name]	Print and return to standard mode (in page mode)
	[Format]	ASCII FF Hex 0C Decimal 12
	[Default]	None
	[Range]	None
	[Description]	In page mode, prints all the data in the print buffer collectively and switches from page mode to standard mode.
	[Notes]	■ This command is enabled only in page mode. See **FF** (in standard mode) to use this command in standard mode. Page mode can be selected by **ESC L** or **FS L**. ■ The data is deleted in the print area after being printed. ■ This command returns the values set by **ESC W** to the default values. ■ The value set by **ESC T** is maintained. ■ After printing, the print position moves to the beginning of the line. When a left margin is set, the position of the left margin is the beginning of the line.

CR

[Name] Print and carriage return

[Format]

ASCII	CR
Hex	0D
Decimal	13

[Description] Executes one of the following operations.

Print head	When auto line feed is enabled	When auto line feed is disabled
Line thermal	Executes printing and one line feed as **LF**	This command is ignored
Serial dot head	Executes printing and one line feed as **LF**	In standard mode, prints the data in the print buffer and moves the print position to the beginning of the print line. In page mode, moves the print position to the beginning of the print line.

[Notes]

■ With a serial interface, the command performs as if auto line feed is disabled.

■ After printing, the print position moves to the beginning of the line.
When a left margin is set in standard mode, the position of the left margin is the beginning of the line.

■ When this command is processed in page mode, only the print position moves, and the printer does not perform actual printing.

CAN	[Name]	Cancel print data in page mode
	[Format]	ASCII CAN Hex 18 Decimal 24
	[Range]	None
	[Default]	None
	[Description]	In page mode, deletes all the print data in the current print area.
	[Notes]	■ This command is enabled only in page mode. Page mode is selected by **ESC L**. ■ If data set in the previously specified print area is set in the currently specified print area, it is deleted.

DLE EOT n

[Name] Transmit real-time status

[Format]

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

[Range] 1 ≤ **n** ≤ 4

[Description] Transmits the real-time status, using **n** as follows:

n	**Function**
1	Transmit printer status
2	Transmit offline status
3	Transmit error status
4	Transmit roll paper sensor status

[Notes]

■ This is a real-time command that the printer executes upon receiving it.
Take the following into consideration:

• If this command interrupts the code string of another command, this command is processed as a parameter of the other command; therefore, the print result will not be correct.

• If a command such as graphics data or defined data has a code string that is the same as a code string in a parameter, the printer processes and then continues with the bit-image or other command.

■ With a serial interface model, this command is executed even when the printer is offline, the receive buffer is full, or an error occurs.

■ With a parallel interface model, this command is not executed in the following conditions, because the printer is busy and unable to receive data from the host computer.

■ This command can be used when the printer is disabled by **ESC =.**

■ This command is ignored when transmitting block data (Header ~ NUL).

■ Each status equals 1 byte.

■ Printer status (**n** = 1) is as follows:

Bit	Binary	Hex	Decimal	Status
0	0	00	0	Not used. Fixed to Off.
1	1	02	2	Not used. Fixed to On.
2	0	00	0	Drawer kick-out connector pin 3 is LOW.
	1	04	4	Drawer kick-out connector pin 3 is HIGH.
3	0	00	0	Online.
	1	08	8	Offline.
4	1	10	16	Not used. Fixed to On.
5	0	00	0	Not waiting for online recovery.
	1	20	32	Waiting for online recovery.
6	0	00	0	Paper is not being fed by the paper feed button.
	1	40	64	Paper is being fed by the paper feed button.
7	0	00	0	Not used. Fixed to Off.

■ Offline status A (**n** = 2) is as follows:

Bit	Binary	Hex	Decimal	Status
0	0	00	0	Not used. Fixed to Off.
1	1	02	2	Not used. Fixed to On.
2	0	00	0	Cover is closed.
	1	04	4	Cover is open.
3	0	00	0	Paper is not being fed by the paper feed Button
	1	08	8	Paper is being fed by the paper feed button.

4	1	10	16	Not used. Fixed to On.
5	0	00	0	No paper-end stop
	1	20	32	No paper-end stop
6	0	00	0	No error.
	1	40	64	Error occurred..
7	0	00	0	Not used. Fixed to Off.

■ Error status (**n** = 3) is as follows:

Bit	**Binary**	**Hex**	**Decimal**	**Status**
0	0	00	0	Not used. Fixed to Off.
1	1	02	2	Not used. Fixed to On.
2	0	00	0	No recoverable error.
	1	04	4	Cover is open.
3	0	00	0	No autocutter error.
	1	08	8	Autocutter error occurred.
4	1	10	16	Not used. Fixed to On.
5	0	00	0	No unrecoverable error
	1	20	32	Unrecoverable error occurred.
6	0	00	0	No auto-recoverable error.
	1	40	64	Auto-recoverable error occurred.
7	0	00	0	Not used. Fixed to Off.

• If recoverable error (bit 2) or autocutter error (bit 3) occurs due to paper jams or the like, it is possible to recover by correcting the cause of the error and executing **DLE ENQ**.

• If an unrecoverable error (bit 5) occurs, turn off the power as soon as possible.

■ Roll paper sensor status (**n** = 4) is as follows:

Bit	Binary	Hex	Decimal	Status
0	0	00	0	Not used. Fixed to Off.
1	1	02	2	Not used. Fixed to On.
2,3	00	00	0	Roll paper near-end sensor: paper adequate.
	11	0C	12	Roll paper near-end sensor: paper near end.
4	1	10	16	Not used. Fixed to On.
5,6	00	00	0	Roll paper end sensor: paper present.
	11	60	96	Roll paper end sensor: paper not present.
7	0	00	0	Not used. Fixed to Off.

• Some paper sensors are not present,)depending on the printer model.
The names of some paper sensors are different, depending on the printer model.

■ Printer status (**n** = 1)

Bits 5 and 6 of the printer status are undefined.

■ Error status (**n** = 3)

Bit 2 of the error status is undefined.

■ Roll paper sensor status (**n** = 4)

When the roll paper cover is open, paper detection
(detected by the roll paper end sensor) may be incorrect.

SYN n

[Name] Turn melody on/off

[Format]

ASCII	SYN	**n**
Hex	16	**n**
Decimal	22	**n**

[Range] **n =** 0, 1, 48, 49

[Default] **n** = 0

[Description]

Turns melody on or off using **n** as follows

n	**Function**
0, 48	Turns melody off.
1, 49	Turns melody on.

ESC FF

[Name] Print data in page mode

[Format]

ASCII	ESC	FF
Hex	1B	0C
Decimal	27	12

[Description]

In page mode, prints the data in the print buffer collectively.

[Notes]

■ This command is enabled only in page mode. Page mode can be selected by **ESC L**.

■ After printing, the printer does not clear the buffered data, the print position, or values set by other commands.

■ The printer returns to standard mode with **FF**, **ESC S**, and **ESC** @. When it returns to standard mode by **ESC** @, all settings are canceled.

■ This command is used when the data in page mode is printed repeatedly.

ESC SP n

[Name] Set right-side character spacing

[Format]

ASCII	ESC	SP	**n**
Hex	1B	20	**n**
Decimal	27	32	**n**

[Range] 0 ≤ **n** ≤ 255

[Default] **n** = 0

[Description]

Sets the right-side character spacing to **n** × (horizontal or vertical motion unit).

[Notes]

■ The character spacing set by this command is effective for alphanumeric, Kana, Thai, and user-defined characters.

■ When characters are enlarged, the character spacing is **n** times normal value. The character spacing for double-width mode is twice the normal value.

■ When standard mode is selected, the horizontal motion unit is used.

■ When page mode is selected, the vertical or horizontal motion unit is used for the print direction set by **ESC T**.

• When the starting position is set to the upper left or lower right of the print area using **ESC T**, the horizontal motion unit is used.

• When the starting position is set to the upper right or lower left of the print area using **ESC T**, the vertical motion unit is used.

■ The character spacing can be set independently in standard mode and in page mode.

• In standard mode this command sets the character spacing of standard mode.

• In page mode this command sets the character spacing of page mode.

■ If the horizontal or vertical motion unit is changed after this command is executed, the character spacing is not changed.

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

■ It is used to change the spacing between characters.

ESC !

[Name] Select print mode(s)

[Format]

ASCII	ESC	!	**n**
Hex	1B	21	**n**
Decimal	27	33	**n**

[Range] 0 ≤ **n** ≤ 255

[Default] **n =** 0

[Description]

Selects the character font and styles (emphasized, double-height, double-width, and underline) together as follows:

***n*: Bit**	**Off/On**	**Hex**	**Decimal**	**Function**
0	Off	00	0	Character font 1 selected.
	On	01	1	Character font 2 selected.
1, 2	—	—	—	Undefined.
3	Off	00	0	Emphasized mode is turned off.
	On	08	8	Emphasized mode is turned on.
4	Off	00	0	Double-height canceled.
	On	10	16	Double-height selected.
5	Off	00	0	Double-width canceled.
	On	20	32	Double-width selected.
6	—	—	—	Undefined.
7	Off	00	0	Underline mode is turned off
	On	80	128	Underline mode is turned on.

[Notes] ■ Settings of this command are effective until **ESC** @ is executed, the printer is reset, the power is turned off, or one of the following commands is executed:

- Bit 0 (character font): **ESC M**
- Bit 3 (Emphasized mode): **ESC E**

	• Bit 4, 5 (character size): **GS !** • Bit 7 (underline mode): **ESC –** ■ Configurations of Font 1 and Font 2 are different, depending on the printer model. If the desired font type cannot be selected with this command, use **ESC M**. ■ The print modes set by this command (Bit 0, 4, 5 and 7) are effective for alphanumeric, DBCS(Double Base Code System) and user-defined characters. ■ The emphasized print modes set by this command (Bit 3) are effective for alphanumeric, DBCS(Double Base Code System), multilingual, and user-defined characters. ■ When some characters in a line are double-height, all characters on the line are aligned at the baseline. ■ When double-width mode is turned on, the characters are enlarged to the right, based on the left side of the character. ■ When both double-height and double-width modes are turned on, quadruple size characters are printed. ■ In standard mode, the character is enlarged in the paper feed direction when double-height mode is selected, and it is enlarged perpendicular to the paper feed direction when double-width mode is selected. However, when character orientation changes in 90° clockwise rotation mode, the relationship between double-height and double-width is reversed. ■ In page mode, double-height and double-width are on the character orientation. ■ The underline thickness is that specified by **ESC –**, regardless of the character size. ■ When underline mode is turned on, 90° clockwise-rotated characters and white/black reverse characters cannot be underlined. ■ The printer cannot underline the space set by **HT**, **ESC $**, and **ESC **.

ESC $

[Name] Set absolute print position

[Format]

ASCII	ESC	$	**nL**	**nH**
Hex	1B	24	**nL**	**nH**
Decimal	27	36	**nL**	**nH**

[Range]

0 ≤ **nL** ≤ 255

0 ≤ **nH** ≤ 255

[Description]

Moves the print position to (**nL** + **nH** × 256) × (horizontal or vertical motion unit) from the left edge of the print area.

[Notes]

■ The printer ignores any setting that exceeds the print area.

■ When standard mode is selected, the horizontal motion unit is used.

■ When page mode is selected, the horizontal or vertical motion unit is used for the print direction set by **ESC T**.

- When the starting position is set to the upper left or lower right of the print area using **ESC T**, the horizontal motion unit is used.
- When the starting position is set to the upper right or lower left of the print area using **ESC T**, the vertical motion unit is used.

■ If the horizontal or vertical motion unit is changed after this command is executed, the print position is not changed.

■ Even if underline mode is turned on, the underline will not be printed under the space skipped by this command.

ESC %	[Name]	Select/cancel user-defined character set
	[Format]	ASCII ESC % **n** Hex 1B 25 **n** Decimal 27 37 **n**
	[Range]	0 ≤ **n** ≤ 255
	[Default]	**n** = 0
	[Description]	Selects or cancels the user-defined character set. • When the LSB of **n** is 0, the user-defined character set is canceled. • When the LSB of **n** is 1, the user-defined character set is selected.
	[Notes]	■ When the user-defined character set is canceled, the resident character set is Automatically selected. ■ Settings of this command are effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC &

[Name] Define user-defined characters

[Format]

ASCII	ESC	&	**y**	**c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]**
Hex	1B	26	**y**	**c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]**
Decimal	27	38	**y**	**c1 c2 [x1 d1 ... d(y × x1)] ... [xk d1 ... d(y × xk)]**

[Range]

y = 3

32 ≤ **c1** ≤ **c2** ≤ 126

0 ≤ **x** ≤ 12 (Font A (14 × 28))

0 ≤ **x** ≤ 9 (Font B (10 × 20))

0 ≤ **d** ≤ 255

k = **c2** – **c1** + 1

[Default] None

[Description]

Defines the user-defined character pattern for the specified character codes.

- **y** specifies the number of bytes in the vertical direction.
- **c1** specifies the beginning character code for the definition, and **c2** specifies the final code.
- **x** specifies the number of dots in the horizontal direction from the left.
- **d** specifies the defined data (column format).
- **k** indicates the number of defined data. **k** is an explanation parameter; therefore it does not need to be transmitted.

[Notes]

■ Character codes from the alphanumeric characters (20H (decimal 32) to 7EH (decimal 126)) can be defined.

■ Data (**d**) specifies a bit printed to 1 and not printed to 0. The dot pattern is in the horizontal direction from the left side. Any remaining dots on the right side are blank.

■ The data to define a user-defined character is (**y** × **x**) bytes.

■ When the value of **y**, **c1**, **c2**, or **x** is out of the range, this command is canceled, and

the following data is processed as normal data.

■ This command can define user-defined characters for each font independently.

To select a font, use **ESC !** or **ESC M**.

■ A user-defined character, downloaded graphics, and downloaded bit image cannot be defined simultaneously on some printer models.

• When this command is executed, the downloaded bit image is cleared.

■ The user-defined characters are not defined at the default, and the resident characters are printed.

■ The relationship between the definition data and printing result is as follows.

Example: Downloaded character definition consists of 9 × 7 dots.

d1	**d3**	**d5**	**d7**	**d9**	**d11**	**d13**	MSB LSB
d2	**d4**	**d6**	**d8**	**d10**	**d12**	**d14**	MSB LSB

ESC *

[Name] Select bit-image mode

[Format]

ASCII	ESC	✻	**m**	**n_L**	**n_H**	**d1 ... dk**
Hex	1B	2A	**m**	**n_L**	**n_H**	**d1 ... dk**
Decimal	27	42	**m**	**n_L**	**n_H**	**d1 ... dk**

[Range]

m = 0, 1, 32, 33

0 ≤ **n_L** ≤ 255

0 ≤ **n_H** ≤ 3

0 ≤ **d** ≤ 255

k = **n_L** + **n_H** × 256 [in case of m = 0, 1]

k = (**n_L** + **n_H** × 256) × 3 [in case of m = 32, 33]

[Default] None

[Description]

Stores the bit image data in the print buffer using the mode specified by **m** as follows:

m	Mode	Number of bits for vertical data	Dot density in horizontal	Amount of data (k)
0	8-dot single-density	8	Single-density	**n_L** + **n_H** × 256
1	8-dot double-density	8	Double-density	**n_L** + **n_H** × 256
32	24-dot single-density	24	Single-density	(**n_L** +**n_H** × 256) × 3
33	24-dotdouble-density	24	Double-density	(**n_L** + **n_H** × 256) × 3

- **n_L**, **n_H** specifies a bit image in the horizontal direction as (**n_L** + **n_H** × 256) dots.
- specifies the bit image data (column format).
- **k** indicates the amount of bit image data. **k** is an explanation parameter; therefore it does not need to be transmitted.

[Notes]

■ Data (**d**) specifies a bit printed to 1 and not printed to 0.

■ If the bit image data exceeds the number of dots to be printed on a line, the excess data is ignored.

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

■ After printing a bit image, the printer processes normal data.

■ When printing multiple line bit images, selecting unidirectional print mode with **ESC U** enables printing patterns in which the top and bottom parts are aligned vertically.

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

■ The relationship between the bit image data and the print result is as follows.

8 dot mode (**m** = 0,1)

d1	**d1**	**.....**	**dk**	**MSB**
				LSB

24 dot mode (**m** = 32, 33)

d1	**d4**	**.....**	**dk-2**	**MSB**
				LSB
d2	**d5**	**.....**	**dk-1**	**MSB**
				LSB
d3	**d6**	**.....**	**dk**	**MSB**
				LSB

ESC -

[Name] Turn underline mode on/off

[Format]

ASCII	ESC	–	**n**
Hex	1B	2D	**n**
Decimal	27	45	**n**

[Range] 0 ≤ **n** ≤ 2, 48 ≤ **n** ≤ 50

[Default] **n** = 0

[Description]

Turns underline mode on or off using **n** as follows:

n	**Function**
0, 48	Turns off underline mode
1, 49	Turns on underline mode (1-dot thick)
2, 50	Turns on underline mode (2-dots thick)

[Notes]

■ The underline mode is effective for alphanumeric, Kana, Thai, and user-defined characters.

■ When underline mode is turned on, 90° clockwise rotated characters and white/black reverse characters cannot be underlined.

■ The printer cannot underline the space set by **HT**, **ESC $**, and **ESC **.

■ Changing the character size does not affect the current underline thickness.

■ When underline mode is turned off, the following data cannot be underlined, but the thickness is maintained.

■ This command and bit 7 of **ESC !** turn on and off underline mode in the same way.

■ Some of the printer models support the 2-dot thick underline (**n** = 2 or 5).

ESC 2	[Name]	Select default line spacing
	[Format]	ASCII ESC 2 Hex 1B 32 Decimal 27 50
	[Range]	None
	[Default]	None
	[Description]	Sets the line spacing to the “default line spacing.”
	[Notes]	■ The line spacing can be set independently in standard mode and in page mode. • In standard mode this command sets the line spacing of standard mode. • In page mode this command sets the line spacing of page mode. ■ Selected line spacing is effective until **ESC 3** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC 3

[Name] Set line spacing

[Format]

ASCII	ESC	3	**n**
Hex	1B	33	**n**
Decimal	27	51	**n**

[Range] 0 ≤ **n** ≤ 255

[Default] Printers other than the above: Amount of line spacing which corresponds to "default line spacing." (See **ESC 2** for the default line spacing.)

[Description] Sets the line spacing to **n** × (vertical or horizontal motion unit).

[Notes]

■ The maximum line spacing is 1016 mm {40 inches}.
If the specified amount exceeds 1016 mm {40 inches},
the line spacing is automatically set to 1016 mm {40 inches}.

■ When standard mode is selected, the vertical motion unit is used.

■ When page mode is selected, the vertical or horizontal motion unit is used for the print direction set by **ESC T**.

- When the starting position is set to the upper left or lower right of the print area using **ESC T**, the vertical motion unit is used.
- When the starting position is set to the upper right or lower left of the print area using **ESC T**, the horizontal motion unit is used.

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

- In standard mode this command sets the line spacing of standard mode.
- In page mode this command sets the line spacing of page mode.

■ When the motion unit is changed after the line spacing is set, the line spacing setting does not change.

■ Selected line spacing is effective until **ESC 2** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC =

[Name] Select peripheral device

[Format]

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

[Range] 1 ≤ **n** ≤ 3

[Default] **n** = 1

[Default] Selects the device to which the host computer transmits data, using **n** as follows:

n	**Function**
1,3	Enables printer.
2	Disables printer

[Notes]

■ When the printer is disabled, it ignores all received data and commands with the exception of **ESC =** and real-time commands.

■ If ASB is enabled when the printer is disabled by this command, the printer transmits the ASB status message whenever the status changes. See the description of **GS a** for ASB function.

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

■ The default value when the power supply is turned on and when **ESC** @ is executed might be different.

- The default value when the power supply is turned on becomes the [default value].

ESC ?	[Name]	Cancel user-defined characters			
	[Format]	ASCII	ESC	?	**n**
		Hex	1B	3F	**n**
		Decimal	27	63	**n**
	[Range]	32 ≤ **n** ≤ 126			
	[Default]	None			
	[Description]				
		Deletes the user-defined character pattern specified by character code **n**.			
	[Notes]				
		■ After the user-defined characters are canceled, the resident character set is printed.			
		■ This command can cancel user-defined characters for each font independently. To select a font, use **ESC !** or **ESC M**.			

ESC @

[Name] Initialize printer

[Format]

ASCII	ESC	@
Hex	1B	40
Decimal	27	64

[Range] None

[Default] None

[Description]

Clears the data in the print buffer and resets the printer modes to the modes that were in effect when the power was turned on.

- Any macro definitions are not cleared.
- Offline response selection is not cleared.
- **GS A** settings are not cleared.
- Contents of user NV memory are not cleared.
- NV graphics (NV bit image) and NV user memory are not cleared.
- The maintenance counter value is not affected by this command.
- The specifying of offline response isn't cleared.

[Notes]

■ The DIP switch settings are not checked again.
The data in the receive buffer is not cleared.
When this command is processed in page mode, the printer deletes the data in the print areas, initializes all settings, and selects standard mode.

■ This command can cancel all the settings, such as print mode and line feed, at the same time.

■ The print position moves to the beginning of the line when this command is executed.
When a left margin is set in standard mode, the position of the left margin is the beginning of the line or there is no data in the print buffer.

ESC D

[Name] Set horizontal tab positions

[Format]

ASCII	ESC	D	**n1 ... nk**	**NUL**
Hex	1B	44	**n1 ... nk**	**00**
Decimal	27	68	**n1 ... nk**	**0**

[Range] 1 ≤ **n** ≤ 255

0 ≤ **k** ≤ 32

[Default] **n** = 8, 16, 24, 32, ... (Every eight characters for the default font set by **ESC !** or **ESC M)**

[Description]

Sets horizontal tab positions.

- **n** specifies the number of digits from the setting position to the left edge of the print area.
- **k** indicates the number of horizontal tab positions to be set.

[Notes]

■ The horizontal tab position is stored as a value of [character width × **n**] measured from the beginning of the line. The character width includes the right-side character spacing, and double-width characters are selected with twice the width of normal characters.

■ The character width should be set before using this command. Settings of character fonts, space width, and enlargement affect the setting of character width.

■ A maximum of 32 horizontal tab positions can be set. Data exceeding 32 horizontal tab positions is processed as normal data.

■ This command cancels any previous horizontal tab settings.

■ Transmit [**n**]**k** in ascending order and place a **NUL** code at the end. **ESC D NUL** cancels all horizontal tab positions.

■ When [**n**] is less than or equal to the preceding value [**n**]**k**-1, horizontal tab setting is finished, and the following data is processed as normal data.

■ **k** is not transmission data to the printer.

■ Even if the character width is changed after setting the horizontal tab positions, the setting of the horizontal tab positions will not be changed.

	■ Horizontal tab position settings are effective until **ESC** @ is executed, the printer is reset, or the power is turned off. ■ Print position can be changed by **HT**. ■ When the left margin setting is changed, the horizontal tab position is also changed.

ESC E

[Name] Turn emphasized mode on/off

[Format]

ASCII	ESC	E	**n**
Hex	1B	45	**n**
Decimal	27	69	**n**

[Range] 0 ≤ **n** ≤ 255

[Default] **n** = 0

[Description]

Turns emphasized mode on or off.

- When the LSB of **n** is 0, emphasized mode is turned off.
- When the LSB of **n** is 1, emphasized mode is turned on.

[Notes]

■ This mode is effective for alphanumeric, Kana, multilingual, and user-defined characters.

■ The settings of this command are effective until **ESC !** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC G	[Name]	Turn double-strike mode on/off
	[Format]	ASCII ESC G **n** Hex 1B 47 **n** Decimal 27 71 **n**
	[Range]	0 ≤ **n** ≤ 255
	[Default]	**n** = 0
	[Description]	Turns double-strike mode on or off. • When the LSB of **n** is 0, double-strike mode is turned off. • When the LSB of **n** is 1, double-strike mode is turned on.
	[Notes]	■ The double-strike mode is effective for alphanumeric, Kana, multilingual, and user-defined characters.

ESC J

[Name] Print and feed paper

[Format]

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

[Range] 0 ≤ **n** ≤ 255

[Default] None

[Description]

Prints the data in the print buffer and feeds the paper **n** × (vertical or horizontal motion unit).

[Notes]

■ The maximum paper feed amount is 1016 mm {40 inches}.
If the specified amount exceeds 1016 mm {40 inches}, the paper feed amount is automatically set to 1016 mm {40 inches}.

■ When standard mode is selected, the vertical motion unit is used.

■ When page mode is selected, the vertical or horizontal motion unit is used for the print direction set by **ESC T**.

- When the starting position is set to the upper left or lower right of the print area using **ESC T**, the vertical motion unit is used.
- When the starting position is set to the upper right or lower left of the print area using **ESC T**, the horizontal motion unit is used.

■ After printing, the print position moves to the beginning of the line. When a left margin is set in standard mode, the position of the left margin is the beginning of the line.

■ When this command is processed in page mode, only the print position moves; the printer does not perform actual printing.

■ This command is used to temporarily feed a specific length without changing the line spacing set by other commands.

ESC L

[Name] Select page mode

[Format]

ASCII	ESC	L
Hex	1B	4C
Decimal	27	76

[Range] one

[Default] one

[Description]

switches from standard mode to page mode.

[Notes]

This command is enabled only when processed at the beginning of the line in andard mode. In other cases, this command is ignored.

■ The print position is the starting position specified by **ESC T** within the print area defined by **ESC W**.

■ The following commands switch the settings for page mode because these commands can be set independently in standard mode and in page mode:

- **ESC SP**, **ESC 2**, **ESC 3**, **ESC U**, and **FS S**

■ The following commands are disabled in page mode.

- **ESC L, FS g 1, FS q, GS (A, GS (C** (part of functions), **GS (E, GS (L / GS 8 L** (part of functions), **GS (M** (part of functions), **GS T**, and **GS g 0**

■ The following commands are not effective in page mode. If these commands are processed in page mode, an internal flag is activated, and this flag is enabled when the printer returns to standard mode.

- **ESC V, ESC a, ESC {, GS L,** and **GS W**

■ The printer returns to standard mode with **ESC S**, **FF**, and **ESC** @. When it returns to standard mode by **ESC** @, all settings are canceled.

■ Standard mode is selected as the default.

■ In page mode, the printer prints the data in the print buffer for the print area

specified by **ESC W**
collectively by **FF** or **ESC FF**. When executing the print and paper feed commands, such as **LF**, **CR**, **ESC J**, and **ESC d**, only the print position moves; the printer does not perform actual printing.
GS v 0 is disabled in page mode with this printer, which is an addition to the standard specification.

ESC M

[Name] Select character font

[Format]

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

[Range] **n** = 0, 1, 48, 49

[Default] **n** = 0

[Description]

Selects a character font, using **n** as follows:

n	**Font**
0, 48	Font A
1, 49	Font B

[Notes]

■ The character font set by this command is effective for alphanumeric, Hangul, Thai, and user-defined characters.
■ Configurations of Font A and Font B depend on the printer model.
■ The settings of this command are effective until **ESC !** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC R

[Name] Select an international character set

[Format]

ASCII	ESC	R	**n**
Hex	1B	52	**n**
Decimal	27	82	**n**

[Range] 0 ≤ **n** ≤ 15

[Description]

Selects an international character set **n** as follows:

n	**Country**
0	U.S.A.
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	Korean
14	Slovenia / Croatia
15	Chinese
16	Vietnum
17	Arabia

Country	ASC II code(Hex)													
	23	24	25	2A	40	5B	5C	5D	5E	60	7B	7C	7D	7E
USA	#	$	%	*	@	[	\	]	^	`	{	|	}	~
France	#	$	%	*	à	°	ç	§	^	`	é	ù	è	¨
Germany	#	$	%	*	§	Ä	Ö	Ü	^	`	ä	ö	ü	β
U.K.	£	$	%	*	@	[	\	]	^	`	{	|	}	~
Denmark I	#	$	%	*	@	Æ	Ø	Å	^	`	æ	Ø	å	~
Sweden	#	¤	%	*	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	$	%	*	@	°	\	é	^	ù	à	ò	è	ì
Spain I	Pt	$	%	*	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Japan	#	$	%	*	@	[	¥	]	^	`	{	|	}	~
Norway	#	¤	%	*	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Denmark II	#	$	%	*	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Spain II	#	$	%	*	à	¡	Ñ	¿	é	`	í	ñ	ó	ú

Latin America	#	$	%	*	à	¡	Ñ	¿	é	ü	í	ñ	ó	ú
Korea	#	$	%	*	@	[	₩	]	^	`	{	|	}	~
Slovenia/Croatia	#	$	%	*	Ž	Š	Đ	Ć	Č	ž	š	đ	ć	č
China	#	¥	%	*	@	[	\	]	^	`	{	|	}	~
Vietnum	₫	$	%	*	@	[	\	]	^	`	{	|	}	~
Arabia	#	$	%	*	@	[	\	]	^	`	{	|	}	~

[Notes]

■ The selected international character set is effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC S

[Name] Select standard mode

[Format]

ASCII	ESC	S
Hex	1B	53
Decimal	27	83

[Description]

Switches from page mode to standard mode.

[Notes]

■ This command is enabled only in page mode. Page mode can be selected by **ESC L**.

■ When this command is executed, data in all the print areas is cleared, the print area set by **ESC W** returns to the default value, but the value set by **ESC T** is maintained.

■ The following commands switch the settings for standard mode because these commands can be set independently in standard mode and in page mode:

- **ESC SP, ESC 2, ESC 3, ESC U,** and **FS S**.

■ In standard mode, **CAN, ESC FF, GS $,** and **GS ** are ignored.

■ The settings of **ESC T** and **ESC W** do not affect printing in standard mode.

■ The printer selects page mode with **ESC L**.

■ Standard mode is selected as the default.

ESC T

[Name] Select print direction in page mode

[Format]

ASCII	ESC	T	**n**
Hex	1B	54	**n**
Decimal	27	84	**n**

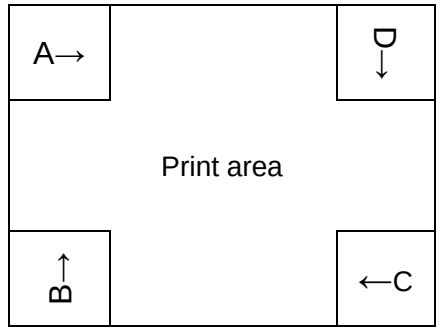
[Range] 0 ≤ **n** ≤ 3, 48 ≤ **n** ≤ 51

[Default] **n** = 0

[Description]

In page mode, selects the print direction and starting position using **n** as follows:

n	**Print direction**	**Starting position**
0, 48	Left to right	Upper left (A in the figure)
1, 49	Bottom to top	Lower left (B in the figure)
2, 50	Right to left	Lower right (C in the figure)
3, 51	Top to bottom	Upper right (D in the figure)



[Notes]

■ The print direction set by this command is effective only in page mode.

■ This command setting has no effect in standard mode.

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

■ The parameters for the horizontal or vertical motion unit differ, depending on the starting position of the print area as follows:

• If the starting position is the upper left or lower right of the print area:

These commands use horizontal motion units: **ESC SP**, **ESC $**, **ESC **

These commands use vertical motion units: **ESC 3**, **ESC J**, **GS $**, **GS **

• If the starting position is the upper right or lower left of the print area:

	These commands use horizontal motion units: **ESC 3**, **ESC J**, **GS $**, **GS ** These commands use vertical motion units: **ESC SP**, **ESC $**, **ESC ** ■ The settings of this command are effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

ESC V

[Name] Turn 90° clockwise rotation mode on/off

[Format]

ASCII	ESC	V	**n**
Hex	1B	56	**n**
Decimal	27	86	**n**

[Range] **n** = 0, 1, 48, 49

[Default] **n** = 0

[Description]

In standard mode, turns 90° clockwise rotation mode on or off for characters, using **n** as follows:

n	**Function**
0, 48	Turns off 90° clockwise rotation mode.
1, 48	Turns on 90° clockwise rotation mode (1-dot character spacing).
2, 50	Turns on 90° clockwise rotation mode (1.5-dot character spacing).

[Notes]

■ The 90° clockwise rotation mode is effective for alphanumeric, Hangul, multilingual, and user-defined characters.

■ When underline mode is turned on, the printer does not underline 90° clockwise-rotated characters.

■ When character orientation changes in 90° clockwise rotation mode, the relationship between vertical and horizontal directions is reversed.

■ The 90° clockwise rotation mode has no effect in page mode. If this command is processed in page mode, an internal flag is activated, and this flag is enabled when the printer returns to standard mode.

■ Some printer models support 90° clockwise rotation mode when **n** = 2 or 50.

■ Some printer models have a font for which 90° clockwise rotation mode is not effective.

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

ESC W

[Name] Set print area in page mode

[Format]

ASCII	ESC	W	**x_L**	**x_H**	**y_L**	**y_H**	**dx_L**	**dx_H**	**dy_L**	**dy_H**
Hex	1B	57	**x_L**	**x_H**	**y_L**	**y_H**	**dx_L**	**dx_H**	**dy_L**	**dy_H**
Decimal	27	87	**x_L**	**x_H**	**y_L**	**y_H**	**dx_L**	**dx_H**	**dy_L**	**dy_H**

[Range] $0 \le$ **x_L**, **x_H**, **y_L**, **y_H**, **dx_L**, **dx_H**, **dy_L**, **dy_H** ≤ 255

(except for **dx_L** = **dx_H** = 0 or **dy_L** = **dy_H** = 0)

[Default] Horizontal logical origin and vertical logical origin= 0

x_L = 0, **x_H** = 0, **y_L** = 0, **y_H** = 0

Print area width and print area height = entire printable area

[Description]

In page mode, sets the size and the logical origin of the print area as follows:

- Horizontal logical origin = (**x_L**+**x_H**×256)×(horizontal motion unit) from absolute origin.
- Vertical logical origin = (**y_L** + **y_H** × 256) × (vertical motion unit) from absolute origin.
- Print area width = (**dx_L** + **dx_H** × 256) × (horizontal motion unit)
- Print area height = (**dy_L** + **dy_H** × 256) × (vertical motion unit)

[Notes]

■ Both print area width and height cannot be set to 0.

■ The absolute origin is the upper left of the printable area.

■ If the horizontal or vertical logical origin is set outside the printable area, this command is canceled, and the following data is processed as normal data.

■ If [horizontal logical origin + print area width] exceeds the printable area, the print area width is automatically set to [horizontal printable area – horizontal logical origin].

■ If [vertical logical origin + print area height] exceeds the printable area, the print area height is automatically set to [vertical printable area – vertical logical origin].

■ The print area and the logical origin set by this command are effective only in page mode.

■ This command setting has no effect in standard mode. If this command is processed in standard mode, the logical origin and the print area are set, and they are enabled when the printer selects page mode.

	■ Horizontal logical origin and print area width are calculated using the vertical motion unit. ■ Vertical logical origin and print area height are calculated using the horizontal motion unit. ■ Even if the horizontal or vertical motion unit is changed after changing the printable area, the setting of the printable area will not be changed. ■ The settings of this command are effective until **FF** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off.

**ESC **

[Name] Set relative print position

[Format]

ASCII	ESC	\	**nL**	**nH**
Hex	1B	5C	**nL**	**nH**
Decimal	27	92	**nL**	**nH**

[Range] –32768 ≤ (**nL** + **nH** × 256) ≤ 32767

[Default] None

[Description] Moves the print position to (**nL** + **nH** × 256) × (horizontal or vertical motion unit) from the current position.

[Notes]

■ The printer ignores any setting that exceeds the print area.

■ A positive number specifies movement to the right, and a negative number specifies movement to the left. N pitch movement to the right: (**nL** + **nH** × 256) = N. Use the complement of N for setting N pitch movement to the left: (**nL** + **nH** × 256) = 65536 – N.

■ When standard mode is selected, the horizontal motion unit is used.

■ When page mode is selected, the horizontal or vertical motion unit is used for the print direction set by **ESC T**.

- When the starting position is set to the upper left or lower right of the print area using **ESC T**, the horizontal motion unit is used.
- When the starting position is set to the upper right or lower left of the print area using **ESC T**, the vertical motion unit is used.

■ Even if the vertical or horizontal motion unit is changed after changing the print position, the setting of the print position will not be changed.

■ When underline mode is turned on, the underline will not be printed under the space skipped by this command.

■ “\” corresponds to “\” in the JIS code system

ESC a

[Name] Select justification

[Format]

ASCII	ESC	a	**n**
Hex	1B	61	**n**
Decimal	27	97	**n**

[Range] 0 ≤ **n** ≤ 2, 48 ≤ **n** ≤ 50

[Default] **n** = 0

[Description]

In standard mode, aligns all the data in one line to the selected layout, using **n** as follows:

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

[Notes]

■ When standard mode is selected, this command is enabled only when processed at the beginning of the line in standard mode.

■ The justification has no effect in page mode. If this command is processed in page mode, an internal flag is activated, and this flag is enabled when the printer returns to standard mode.

■ This command executes justification in the print area set by **GS L** and **GS W**.

■ This command justifies printing data (such as characters, all graphics, bar codes, and two dimensionl codes) and space area set by **HT**, **ESC $**, and **ESC **.

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

ESC d	[Name]	Print and feed **n** lines			
	[Format]	ASCII	ESC	d	**n**
		Hex	1B	64	**n**
		Decimal	27	100	**n**
	[Range]	0 ≤ **n** ≤ 255			
	[Description]				
		Prints the data in the print buffer and feeds **n** lines.			
	[Notes]				
		■ The amount of paper fed per line is based on the value set using the line spacing command (**ESC 2** or **ESC 3**). ■ The maximum paper feed amount is 1016 mm {40 inches}. If the specified amount exceeds 1016 mm {40 inches}, the paper feed amount is automatically set to 1016 mm {40 inches}. ■ After printing, the print position moves to the beginning of the line. When a left margin is set in standard mode, the position of the left margin is the beginning of the line. ■ When this command is processed in page mode, only the print position moves, and the printer does not perform actual printing. ■ This command is used to temporarily feed a specific line without changing the line spacing set by other commands.			

ESC i	[Name] Partial cut (one point left uncut) [Format] ASCII ESC i Hex 1B 69 Decimal 27 105 [Description] Executes a partial cut of the roll paper. [Recommended Functions] This command is supported by some printer models but will not be supported by future printer models. **GS V** is recommended for cutting paper. **GS V** <Function A> gives the same result as this command. [Notes] ■ See **GS V <Function A>**for details. ■ The cutting shape depends on the specification of the mounted autocutter.

ESC m	[Name] Partial cut (three points left uncut) [Format] ASCII ESC m Hex 1B 6D Decimal 27 109 [Description] Executes a partial cut of the roll paper. [Recommended Functions] This command is supported by some printer models but will not be supported by future printer models. **GS V** is recommended for cutting paper. **GS V** <Function A> gives the same result as this command. [Notes] ■ See **GS V** <Function A> for details. ■ The cutting shape depends on the specification of the mounted autocutter.

ESC p

[Name] Generate pulse

[Format]

ASCII	ESC	p	**m**	**t1**	**t2**
Hex	1B	70	**m**	**t1**	**t2**
Decimal	27	112	**m**	**t1**	**t2**

[Range]

m = 0, 1, 48, 49

0 ≤ **t1** ≤ 255

0 ≤ **t2** ≤ 255

[Description]

Outputs the pulse specified by **t1** and **t2** to the specified connector pin **m** as follows:

m	**Connector pin**
0, 48	Drawer kick-out connector pin 2
1, 49	Drawer kick-out connector pin 5

• The pulse for ON time is (**t1** × 2 msec) and for OFF time is (**t2** × 2 msec).

[Notes]

■ If **t2** < **t1**, the OFF time is equal to the ON time.

ESC t

[Name] Select character code table

[Format]

ASCII	ESC	t	**n**
Hex	1B	74	**n**
Decimal	27	116	**n**

[Range] 0 ≤ **n** ≤ 5, 16 ≤ **n** ≤ 27, 41 ≤ **n** ≤ 58, **n**=255

[Default] **n** = 0

[Description]

Selects a page n from the character code table as follows:

n	**Character Code Table**
0	Page 0 [PC437 (USA, Standard Europe]
1	Page 1 [Katakana]
2	Page 2 [PC850 (Multilingual)]
3	Page 3 [PC860 (Portuguese)]
4	Page 4 [PC863 (Canadian-French)]
5	Page 5 [PC865 (Nordic)]
16	Page 16 [PC1252 (Latin I)]
17	Page 17 [PC866 (Cyrillic Russian)]
18	Page 18 [PC852 (Latin II)]
19	Page 19 [PC858 (Euro)]
20	Page 20 [Thai 42]
21	Page 21 [Thai 11]
23	Page 23 [Thai 14]
24	Page 24 [Thai 16]
26	Page 26 [Thai 18]
27	Page 27 [PC874 (Thailand)]
41	Page 41 [PC737 (Greek)]
42	Page 42 [PC775 (Baltic)]

43	Page 43 [PC855 (Cyrillic)]
44	Page 44 [PC857 (Turkish)]
45	Page 45 [PC861 (Icelandic)]
46	Page 46 [PC862 (Hebrew)]
47	Page 47 [PC864 (Arabic)]
48	Page 48 [PC869 (Greek II)]
51	Page 51 [PC1251 (Cyrillic)]
53	Page 53 [PC1253 (Greek)]
54	Page 54 [PC1254 (Turkish)]
55	Page 55 [PC1255 (Hebrew)]
56	Page 56 [PC1256 (Arabic)]
57	Page 57 [PC1257 (Baltic)]
58	Page 58 [PC1258 (Vietnam)]
59	Page 59 [PC1250 (Central European)]
60	Page 60 [FARCI(IRAN)]
252	Page 252 [PC950 (Traditional Chinese Big5)]
253	Page 253 [PC936 (Simplified Chinese GBK)]
254	Page 254 [PC932 (Japan Shift-JIS)]
255	Page 255 [PC949 (Korean)]

[Notes]

■ The alphanumeric characters (20H (decimal 32) to 7FH (decimal 127)) are the save for each page. The extended characters (80H (decimal 128) to FFH (decimal 255)) are different for each page.

ESC {

[Name] Turn upside-down print mode on/off

[Format]

ASCII	ESC	{	**n**
Hex	1B	7B	**n**
Decimal	27	123	**n**

[Range] 0 ≤ **n** ≤ 255

[Default] **n** = 0

[Description]

In standard mode, turns upside-down print mode on or off.

- When the LSB of **n** is 0, upside-down print mode is turned off.
- When the LSB of **n** is 1, upside-down print mode is turned on.

[Notes]

■ When standard mode is selected, this command is enabled only when processed at the beginning of the line.

■ The upside-down print mode is effective for all data in standard mode except the following:

- Raster bit image from **GS v 0**.

■ The upside-down print mode has no effect in page mode. If this command is processed in page mode, an internal flag is activated, and this flag is enabled when the printer returns to standard mode.

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

■ When upside-down print 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.

FS p

[Name] Print NV bit image

[Format]

ASCII	FS	p	**n**	**m**
Hex	1C	70	**n**	**m**
Decimal	28	112	**n**	**m**

[Range] 1 ≤ **n** ≤ 255

0 ≤ **m** ≤ 3, 48 ≤ **m** ≤ 51

[Description]

Prints NV bit image **n** using the process of **FS q** and using the mode specified by **m**.

m	**Mode**	**Scaling for horizontal**	**Scaling for vertical**
0, 48	Normal	× 1	× 1
1, 49	Double-width	× 2	× 1
2, 50	Double-height	× 1	× 2
3, 51	Quadruple	× 2	× 2

[Recommended Functions]

This function is supported only by some printer models and may not be supported by future models.

- Multiple logo data and mark data can be specified (except for some models).
- Data can be controlled by key code.
- Redefining or deleting the same data is possible for each key code.
- Color can be specified for the definition data.
- Data can be defined by raster format.
- The remaining capacity of the definition area can be confirmed.

[Notes]

■ This command is not effective when the NV bit image specified by **n** has not been defined.

■ In standard mode, this command is effective only when there is no data in the print buffer and the printer is at the beginning of the line.

■ In page mode, the NV bit image is only stored in the print buffer and is not printed.

	■ If the NV bit image exceeds one line of print area, the printer does not print it. ■ The scales for width and height of NV bit images are specified by **m**. Therefore, in page mode with 90° or 270° clockwise-rotated NV bit image, the printer applies print area and dot density from [width: direction of paper feed, height: perpendicular to direction of paper feed]. ■ This command is not affected by print modes (such as emphasized, underline, character size, or 90° rotated characters), except upside-down print mode. ■ This command executes paper feed for amount needed for printing the NV bit image regardless of paper feed amount set by a paper feed setting command. ■ After printing the bit image, this command sets the print position to the beginning of the line. ■ When printing the NV bit image, selecting unidirectional print mode with **ESC U** enables printing patterns in which the top and bottom parts are aligned vertically. ■ The NV bit image is defined by **FS q**.

FS q

[Name] Define NV bit image

[Format]

ASCII	FS	q	**n**	**[x_L x_H y_L y_H d1...dk]1...[x_L x_H y_L y_H d1...dk]n**
Hex	1C	71	**n**	**[x_L x_H y_L y_H d1...dk]1...[x_L x_H y_L y_H d1...dk]n**
Decimal	28	113	**n**	**[x_L x_H y_L y_H d1...dk]1...[x_L x_H y_L y_H d1...dk]n**

[Range]

$1 \le \mathbf{n} \le 255$

$1 \le (\mathbf{x_L} + \mathbf{x_H} \times 256) \le 1023$ ($0 \le \mathbf{x_L} \le 255$, $0 \le \mathbf{x_H} \le 3$)

$1 \le (\mathbf{y_L} + \mathbf{y_H} \times 256) \le 288$ ($0 \le \mathbf{y_L} \le 255$, $\mathbf{y_H} = 0, 1$)

$0 \le \mathbf{d} \le 255$

$\mathbf{k} = (\mathbf{x_L} + \mathbf{x_H} \times 256) \times (\mathbf{y_L} + \mathbf{y_H} \times 256) \times 8$

Total defined data area is 256 KB

[Description]

Defines the NV bit image in the NV graphics area.

- **n** specifies the number of defined NV bit images.
- $\mathbf{x_L}$, $\mathbf{x_H}$ specifies ($\mathbf{x_L} + \mathbf{x_H} \times 256$) bytes in the horizontal direction for the NV bit image you defined.
- $\mathbf{y_L}$, $\mathbf{y_H}$ specifies ($\mathbf{y_L} + \mathbf{y_H} \times 256$) bytes in the vertical direction for the NV bit image you defined.
- **d** specifies the definition data for the NV bit image (column format).
- **k** indicates the number of the definition data. **k** is an explanation parameter; therefore it does not need to be transmitted.

[Recommended Functions]

This function is supported only by some printer models and may not be supported by ture models.

- Multiple logo data and mark data can be specified (except for some models).
- Data can be controlled by key code.
- Redefining or deleting is possible for each key code.

• Color can be specified for the definition data.
• Data can be defined by raster format.
• The remaining capacity of the definition area can be confirmed.
• Continuous processing possible (without a software reset when a command has been processed).

[Notes]

■ NV bit image means a bit image which is defined in a non-volatile memory.
The NV bit image defined is effective until the next NV bit image is defined.
■ In standard mode, this command is effective only when processed at the beginning of the line.
■ If this command is processed while a macro is being defined, the printer cancels macro definition and starts processing this command. At this time, the macro becomes undefined.
■ **k** bytes data of **d1...dk** is processed as a defined data of a NV bit image.
The defined data (**d**) specifies a bit printed to 1 and not printed to 0.
■ All NV bit images previously defined are canceled.
■ After processing this command, the printer executes a software reset. Therefore, processing this command enables the printer to be in the correct status when the power is turned on.
■ The limitations during processing of this command are as follows:
• Paper cannot be fed by using PAPER FEED button.
• The real-time commands are ignored.
• Even if the ASB function is effective, the ASB status cannot be transmitted.
■ The NV bit image is printed by **FS p**

■ Bit image data and print result are as follows:

d1	**dY+1**	**...**	**.** **.**	MSB LSB
d2	**dY+2**	**...**	**dk-2**	MSB LSB

. .	. .	...	**dk-1**	MSB LSB	
dY	**dY×2**	...	**dk**	MSB LSB	**Y** = **y**L + **y**H × 256

■ Data is written to the non-volatile memory by this command. Note the following when using this command.

• The printer is BUSY when writing the data to the non-volatile memory. In this case, be sure not to transmit data from the host because the printer does not receive data.

• Excessive use of this function may destroy the non-volatile memory. As a guideline, do not use any combination of the following commands more than 10 times per day for writing data to the nonvolatile memory: **FS q**

GS !

[Name] Select character size

[Format]

ASCII	GS	!	**n**
Hex	1D	21	**n**
Decimal	29	33	**n**

[Range] 0 ≤ **n** ≤ 7, 16 ≤ **n** ≤ 23, 32 ≤ **n** ≤ 39, 48 ≤ **n** ≤ 55,
64 ≤ **n** ≤ 71, 80 ≤ **n** ≤ 87, 96 ≤ **n** ≤ 103, 112 ≤ **n** ≤ 119
(1 ≤ height ≤ 8, 1 ≤ width ≤ 8)

[Default] **n** = 0

[Description]

Selects the character height (vertical number of times normal font size) using bits 0 to 2 and selects the character width (horizontal number of times normal font size) using bits 4 to 6, as follows:

Character width selection					
Bit 6	**Bit 5**	**Bit 4**	**Hex**	**Decimal**	**Width**
Off	Off	Off	00	0	1(normal)
Off	Off	On	10	16	2 (double-width)
Off	On	Off	20	32	3
Off	On	On	30	48	4
On	Off	Off	40	64	5
On	Off	On	50	80	6
On	On	Off	60	96	7
On	On	On	70	112	8

Character height selection					
Bit 2	**Bit 1**	**Bit 0**	**Hex**	**Decimal**	**Height**
Off	Off	Off	00	0	1 (normal)
Off	Off	On	01	1	2 (double-height)
Off	On	Off	02	2	3
Off	On	On	03	3	4
On	Off	Off	04	4	5
On	Off	On	05	5	6
On	On	Off	06	6	7
On	On	On	07	7	8

[Notes]

■ The character size set by this command is effective for alphanumeric, Hangul, multilingual, and user-defined characters.

■ When the characters are enlarged with different heights on one line, all the characters on

	the line are aligned at the baseline. ■ When the characters are enlarged widthwise, the characters are enlarged to the right, based on the left side of the character. ■ **ESC !** can also turn double-width and double-height modes on or off. ■ In standard mode, the character is enlarged in the paper feed direction when double-height mode is selected, and it is enlarged perpendicular to the paper feed direction when double-width mode is selected. However, when character orientation changes in 90° clockwise rotation mode, the relationship between double-height and double-width is reversed. ■ In page mode, double-height and double-width are on the character orientation. ■ The setting of the character size of alphanumeric, Katakana, and Thai characters is effective until **ESC !** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off. ■ The setting of the character size of Kanji and multilingual characters (except for Thai) is effective until **FS !** is executed, **FS W** is executed, **ESC** @ is executed, the printer is reset, or the power is turned off.

GS $

[Name] Set absolute vertical print position in page mode

[Format]

ASCII	GS	$	**nL**	**nH**
Hex	1D	24	**nL**	**nH**
Decimal	29	36	**nL**	**nH**

[Range] 0 ≤ **nL** ≤ 255, 0 ≤ **nH** ≤ 255

[Description]

In page mode, moves the vertical print position to
(**nL** + **nH** × 256) × (vertical or horizontal motion unit) from the starting position set by **ESC T**.
In page mode, moves the vertical print position to
[(**nL** + **nH** x 256) x (vertical or horizontal motion unit)] from the starting position set with **ESC T**.

[Notes]

■ This command is enabled only in page mode. If this command is processed in standard mode, it is ignored.

■ The printer ignores any setting that exceeds the print area set by **ESC W**.

■ The horizontal or vertical motion unit is used for the print direction set by **ESC T**.

- When the starting position is set to the upper left or lower right of the print area using **ESC T**, the vertical motion unit is used.
- When the starting position is set to the upper right or lower left of the print area using **ESC T**, the horizontal motion unit is used.

■ Even if the vertical or horizontal motion unit is changed after changing the print position, the print position will not be changed.

GS *

[Name] Define downloaded bit image

[Format]

ASCII	GS	✻	**x**	**y**	**d1 ... d**	***(*x × y × *8)***
Hex	1D	2A	**x**	**y**	**d1 ... d**	***(*x × y × *8)***
Decimal	29	42	**x**	**y**	**d1 ... d**	***(*x × y × *8)***

[Range]

1 ≤ **x** ≤ 255

1 ≤ **y** ≤ 48 (1 ≤ **x** × **y** ≤ 1536)

0 ≤ **d** ≤ 255

k = **x** × **y** × 8

[Default] None

[Description] Defines the downloaded bit image in the downloaded graphic area.

- **x** specifies the number of bytes in horizontal direction as **x** bytes.
- **y** specifies the number of bytes in vertical direction as **y** bytes.
- **d** defines the bit image data (column format).
- **k** indicates the number of the definition data.

k is an explanation parameter; therefore, it does not need to be transmitted.

[Recommended Functions]

This command is supported only by some printer models and may not be supported by future models.

- Multiple number of logo data and mark data can be specified (except for some models).
- Data control by key code is possible.
- Redefining or deleting the same data is possible for each key code.
- Selecting a color for printing is possible.
- Defining data by raster format is possible.
- The remaining capacity of the definition area can be confirmed.

[Notes]

■ Data (**d**) specifies a bit printed to 1 and not printed to 0.

■ The downloaded bit image is not defined at the default.

	■ Once a downloaded bit image has been defined, it is available until another definition is made, **ESC** @ is executed, the printer is reset, or the power is turned off. On some models, when executing **ESC &**, the downloaded bit image data is cleared. ■ On some models. a downloaded bit image and a user-defined character cannot be defined simultaneously. • When this command is executed, the user-defined character is cleared. • When **ESC &** is executed, the downloaded bit image data is cleared. ■ The downloaded bit image is printed by **GS *I***.

GS /

[Name] Print downloaded bit image

[Format]

ASCII	GS	/	**m**
Hex	1D	2F	**m**
Decimal	29	47	**m**

[Range] 0 ≤ **m** ≤ 3, 48 ≤ **m** ≤ 51

[Description]

Prints downloaded bit image using the process of **GS** ✻ and using the mode specified by **m**, as follows:

m	**Mode**	**Scaling for horizontal**	**Scaling for vertical**
0, 48	Normal	× 1	× 1
1, 49	Double-width	× 2	× 1
2, 50	Double-height	× 1	× 2
3, 51	Quadruple	× 2	× 2

[Recommended Functions]

This command is supported only by some printer models and may not be supported by future models.

- Multiple logo data and mark data can be specified. (except for some models)
- Data can be controlled by key code.
- Redefining or deleting the same data is possible for each key code.
- Color can be specified for the definition data.
- Data can be defined by raster format.
- The remaining capacity of definition area can be confirmed.

[Notes]

■ This command is ignored if a downloaded bit image has not been defined.

■ When standard mode is selected, this command is enabled only when there is no data in the print buffer and the printer is in the beginning of the line. If data exists in the print buffer, the printer processes **m** as normal data.

■ When page mode is selected, this command develops the downloaded bit image data in

	the print buffer but the printer does not print the downloaded bit image data. ■ If a downloaded bit image exceeds one line, the excess data is not printed. ■ The scales for width and height of downloaded bit images are specified by **m**. Therefore, in page mode with 90° or 270° clockwise rotated bit image, the printer apply print area and dot density from [width: direction of paper feed, height: perpendicular to direction of paper feed]. ■ The scales for width and height of downloaded bit images are specified by **m**. Therefore, in page mode with 90° or 270° clockwise-rotated bit image, the printer applies print area and dot density from [width: direction of paper feed, height: perpendicular to direction of paper feed]. ■ This command feeds as much paper as is required to print the downloaded bit image, regardless of the line spacing specified by **ESC 2** or **ESC 3**. ■ The downloaded bit image is not affected by print mode (emphasized, double-strike, underline, character size, white/black reverse printing, or 90° clockwise-rotated), except for upside-down print mode. ■ When printing a downloaded bit image, selecting unidirectional print mode with **ESC U** enables printing patterns in which the top and bottom parts are aligned vertically. ■ The downloaded bit image is defined by **GS ✻**. ■ After printing the downloaded bit image, the print position is set to the left of the print area. The printer is in the beginning of a line and data is not in the print buffer.

GS B

[Name] Turn white/black reverse print mode on/off

[Format]

ASCII	GS	B	**n**
Hex	1D	42	**n**
Decimal	29	66	**n**

[Range] 0 ≤ **n** ≤ 255

[Default] **n** = 0

[Description]

Turns white/black reverse print mode on or off.

- When the LSB of **n** is 0, white/black reverse print mode is turned off.
- When the LSB of **n** is 1, white/black reverse print mode is turned on.

[Notes]

■ The white/black reverse print mode is effective for alphanumeric, Hangul, multilingual, and user-defined characters.

■ When white/black reverse print mode is turned on, it also affects the right-side character spacing set by **ESC SP**.

■ When white/black reverse print mode is turned on, it does not affect the space between lines.

■ When underline mode is turned on, the printer does not underline white/black reverse characters.

■ This command is effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

■ In white/black reverse print mode, characters are printed in white on a black background.

GS H

[Name] Select print position of HRI characters

[Format]

ASCII	GS	H	**n**
Hex	1D	48	**n**
Decimal	29	72	**n**

[Range] 0 ≤ **n** ≤ 3

48 ≤ **n** ≤ 51

[Default] **n** = 0

[Description]

Selects the print position of Human Readable Interpretation (HRI) characters when printing a bar code, using **n** as follows:

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

[Notes]

■ HRI characters are printed using the font specified by **GS f**.

■ This command setting is effective until performing of **ESC** @, reset or power-off.

GS I

[Name] Transmit printer ID.

[Format]

ASCII	GS	I	**n**
Hex	1D	49	**n**
Decimal	29	73	**n**

[Range] 1 ≤ **n** ≤ 3, 49 ≤ **n** ≤ 51, 65 ≤ **n** ≤ 69

[Description] Transmits the printer ID specified by n as follows :

n	Printer ID	Specification	ID (hexadecimal)
1, 49	Printer model ID	Receipt MiniPrinter A series	20
2, 50	Type ID		02
3, 51	ROM version ID	Depends on ROM version	02
65	Firmware version	Depends on Firmware version	
66	Manufactured	POSBANK	
67	Printer name	“ECP-500”, “A9”, “A10”, “A7”	
68	Serial number	Depends on serial number.	
69	Type of model	Not used.	

n = 2, Type ID

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Two-byte character code not supported.
	On	01	1	Two-byte character code supported.
1	On	02	2	Autocutter equipped.
2,3,4	Off	00	0	Not used. Fixed to Off.
5,6	-	-	-	Undefined.
7	Off	00	0	Not used. Fixed to Off.

[Notes]

GS L

[Name] Set left margin

[Format]

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

[Range] $0 \le (n_L + n_H \times 256) \le 65535$ ($0 \le n_L \le 255$, $0 \le n_H \le 255$)

[Default] $(n_L + n_H \times 256) = 0$ ($n_L = 0$, $n_H = 0$)

[Description]

In standard mode, sets the left margin to ($n_L + n_H \times 256$) × (horizontal motion unit) from the left edge of the printable area.

[Notes]

■ When standard mode is selected, this command is enabled only when processed at the beginning of the line.

■ The left margin has no effect in page mode. If this command is processed in page mode, the left margin is set and it is enabled when the printer returns to standard mode.

■ If the setting exceeds the printable area, the left margin is automatically set to the maximum value of the printable area.

■ If this command and **GS W** set the print area width to less than the width of one character, the print area width is extended to accommodate one character for the line.

■ Horizontal motion unit is used.

■ If horizontal motion unit is changed after changing left margin, left margin setting is not changed.

■ Left margin setting is effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

■ Left margin position is left edge of the printable area. If left margin setting is changed, left edge of the printable area will move.

GS P

[Name] Set horizontal and vertical motion units

[Format]

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

[Range] 0 ≤ **x** ≤ 255

0 ≤ **y** ≤ 255

[Default] **x** = 180**, y** = 360

[Description]

Sets the horizontal and vertical motion units to approximately 25.4/**x** mm {1/**x**"} and approximately 25.4/**y** mm {1/**y**"}, respectively.

- When **x** = 0, the default value of the horizontal motion unit is used.
- When **y** = 0, the default value of the vertical motion unit is used.

[Notes]

■ The horizontal direction is perpendicular to the paper feed direction and the vertical direction is the paper feed direction.

■ The horizontal and vertical motion units indicate the minimum pitch used for calculating the values of related commands (shown on the next screen).

■ In standard mode, the following commands use **x** or **y**.

- Commands using **x**: **ESC SP, ESC $, ESC \, GS L,** and **GS W**
- Commands using **y**: **ESC 3, ESC J, ESC K, GS A** and **GS V**

■ In page mode, the following commands use **x** or **y**, when the starting position is set to the upper left or lower right of the print area using **ESC T**.

- Commands using **x**: **ESC SP, ESC $, ESC W, ESC ** and **FS S**.
- Commands using **y*:* ESC 3, ESC J, ESC K, ESC W, GS $, GS A, GS V,** and **GS **

■ In page mode, the following commands use **x** or **y**, when the starting position is set to the upper right or lower left of the print area using **ESC T**.

- Commands using **x*:* ESC 3, ESC J, ESC K, ESC W, GS $,** and **GS **
- Commands using **y*:* ESC SP, ESC $, ESC W, ESC \, FS S, GS A** and **GS V**

	■ Setting of this command is effective until **ESC** @ is executed, the printer is reset, or the power is turned off. ■ The calculated result from combining this command with others is truncated to the minimum value of the mechanical pitch. ■ This command does not affect the current setting values.

GS V

[Name] Select cut mode and cut paper

[Format]

Function A	ASCII	GS	V	**m**	
	Hex	1D	56	**m**	
	Decimal	29	86	**m**	
Function B	ASCII	GS	V	**m**	**n**
	Hex	1D	56	**m**	**n**
	Decimal	29	86	**m**	**n**

[Range]

Function A **m** = 1, 49

Function B **m** = 66, 66; 0 ≤ **n** ≤ 255

[Default] None

[Description] Executes paper cutting specified by **m**, as follows:

m		**Function**
<A>	0, 48	Executes a full cut (cuts the paper completely).
	1, 49	Executes a partial cut (one point left uncut).
<B>	65	Feeds paper to (cutting position + **n** × vertical motion unit) and executes a full cut (cuts the paper completely).
	66	Feeds paper to (cutting position + **n** × vertical motion unit) and executes a partial cut(one point left uncut).

• **n** of <B> specify paper feed amount executed immediately before a paper cut.

[Notes for <A>, <B>]

■ When standard mode is selected, these commands are enabled only when processed at the beginning of the line.

■ When using these commands, there is a gap between the cutting position and the print

	position. [Note for <A>] ■ If an autocutter is not provided, this command is ignored. [Notes for <B>] ■ When **n** = 0, the printer feeds the paper to the cutting position and cuts it. ■ If an autocutter is not provided, the printer only feeds the paper for specified amount. ■ Vertical motion unit is used for calculating a paper feed amount

GS W

[Name] Set print area width

[Format]

ASCII	GS	W	**nL**	**nH**
Hex	1D	57	**nL**	**nH**
Decimal	29	87	**nL**	**nH**

[Range]

$0 \le (n_L + n_H \times 256) \le 65535$ ($0 \le n_L \le 255$, $0 \le n_H \le 255$)

[Default]

Entire printable area

nL = 0, **nH** = 2 (when paper width is set to 80 mm)

[Description]

In standard mode, sets the print area width to (**nL** + **nH** × 256) × (horizontal motion unit).

[Notes]

■ When standard mode is selected, this command is enabled only when processed at the beginning of the line.

■ The print area width has no effect in page mode. If this command is processed in page mode, the print area width is set and it is enabled when the printer returns to standard mode.

■ If the [left margin + print area width] exceeds the printable area, the print area width is automatically set to [printable area – left margin].

■ If this command and **GS L** set the print area width to less than the width of one character, the print area width is extended to accommodate one character for the line.

■ Horizontal motion unit is used.

■ If horizontal motion unit is changed after setting the printable area width, the printable area width setting will not be changed.

■ Printable area width setting is effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

**GS **

[Name] Set relative vertical print position in page mode

[Format]

ASCII	GS	\	**nL**	**nH**
Hex	1D	5C	**nL**	**nH**
Decimal	29	92	**nL**	**nH**

[Range] –32768 ≤ (**nL** + **nH** × 256) ≤ 32767

[Default] None

[Description]

In page mode, moves the vertical print position to (**nL** + **nH** × 256) × (vertical or horizontal motion unit) from the current position.

[Notes]

■ This command is enabled only in page mode. If this command is processed in standard mode, it is ignored.

■ The printer ignores any setting that exceeds the print area set by **ESC W**.

■ A positive number specifies movement to the downward, and a negative number specifies movement to the upward. N pitch movement to the downward: (**nL** + **nH** × 256) = N. Use the complement of N for setting N pitch movement to the upward: (**nL** + **nH** × 256) = 65536 – N.

■ The horizontal or vertical motion unit is used for the print direction set by **ESC T**.

- When the starting position is set to the upper left or lower right of the print area using **ESC T**, the vertical motion unit is used.
- When the starting position is set to the upper right or lower left of the print area using **ESC T**, the horizontal motion unit is used.

■ Even if vertical or horizontal motion unit is changed after changing the print position, the setting of print position will not be changed.

■ “\” is corresponds to “\” in JIS code set.

GS a

[Name] Enable/Diasble Automatic Status Back

[Format]

ASCII	GS	a	**n**
Hex	1D	61	**n**
Decimal	29	97	**n**

[Range] 0 ≤ **n** ≤ 255

[Description]

Specifies the status items for ASB (Automatic Status Back).

Bit	Off/On	Hex	Decimal	Status for ASB
0	Off	00	0	Drawer kick-out connector pin 3 status disabled.
	On	01	1	Drawer kick-out connector pin 3 status enabled.
1	Off	00	0	On-line / Off-line status disabled.
	On	02	2	On-line / Off-line status enabled.
2	Off	00	0	Error status disabled.
	On	04	4	Error status enabled.
3	Off	00	0	Paper roll sensor status disabled.
	On	08	8	Paper roll sensor status enabled.
4-7	-	-	-	Undefined

[Notes]

■ The status to be transmitted is the four bytes that follows.

- First byte (printer information)

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Fixed.
1	Off	00	0	Fixed.
2	Off	00	0	Drawer kick-out connector pin 3 is LOW.
	Off	04	4	Drawer kick-out connector pin 5 is HIGH.
3	On	00	0	Online.
	Off	08	8	Offline.

4	Off	10	16	Fixed.
5	Off	00	0	Cover is closed.
	On	20	32	Cover is opened.
6	Off	00	0	Paper is not being fed by using the paper FEED button
	On	40	64	Paper is being fed by using the paper FEED button
7	Off	00	0	Fixed.

■ When the cover is open while the printing is stopped, the printer becomes offline.

- Second byte (printer information

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Not on online waiting status.
	On	01	1	During online waiting status.
1	Off	00	0	Panel button OFF.
	On	02	2	Panel button ON.
2	Off	00	0	No mechanical error.
	On	04	4	Mechanical error has occurred.
3	Off	00	0	No Auto Cutter error.
	On	08	8	Auto Cutter error occurred.
4	Off	00	0	Fixed
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error has occurred.
6	Off	00	0	No automatically recoverable error.
	On	40	64	Automatically recoverable error has occurred.
7	Off	00	0	Fixed.

- Third byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Function
0	Off	00	0	Paper roll near-end sensor : paper adequate.
	On	01	1	Paper roll near-end sensor : paper near end.
1	Off	00	0	Paper roll near-end sensor : paper present.
	On	02	2	Paper roll near-end sensor : paper not present.
2	Off	00	0	Paper roll end sensor : paper present.
	On	04	4	Paper roll end sensor : paper near end.
3	Off	00	0	Paper roll end sensor : paper present.
	On	08	8	Paper roll end sensor : paper not present.
4	Off	00	0	Fixed
5	Off	00	0	Reserved.
6	Off	00	0	Reserved.
7	Off	00	0	Fixed.

■ The paper roll end sensor is unstable when the cover is open.

- Fourth byte (paper sensor information)

Bit	Off/On	Hex	Decimal	Function
0	On	01	1	Reserved.
1	On	02	2	Reserved.
2	On	04	4	Reserved.
3	On	05	8	Reserved.
4	Off	00	0	Fixed.
5	Off	00	0	Reserved.
6	Off	00	0	Reserved.
7	Off	00	0	Fixed.

GS f

[Name] Select font for HRI characters

[Format]

ASCII	GS	f	**n**
Hex	1D	66	**n**
Decimal	29	102	**n**

[Range] **n =** 0, 1, 48, 49

[Default] **n** = 0

[Description]

Selects a font for the Human Readable Interpretation (HRI) characters when printing a bar code, using **n** as follows:

n	**Font of HRI characters**
0, 48	Font A
1, 49	Font B

[Notes]

■ The font set by this command is effective only for HRI character.
■ The composition of the character of each font is different depending on the model.
■ Configurations of Font A and Font B are different, depending on the printer model.
■ HRI characters are printed at the position specified by **GS H.**
■ HRI character is Human Readable Interpretation character indicated with bar code.

GS h	[Name]	Set bar code height			
	[Format]	ASCII	GS	h	**n**
		Hex	1D	68	**n**
		Decimal	29	104	**n**
	[Range]	1 ≤ **n** ≤ 255			
	[Description]	Sets the height of a bar code to **n** dots.			
	[Notes]				
		■ The units for **n** depend on the printer model.			
		■ This command setting is effective until performing of **ESC** @, reset or power-off.			

GS k

[Name] Print bar code

[Format]

(A)	ASCII	GS	k	**m**	**d1 ... dk**		**NUL**
	Hex	1D	6B	**m**	**d1 ... dk**		**NUL**
	Decimal	29	107	**m**	**d1 ... dk**		**NUL**
(B)	ASCII	GS	k	**m**	**n**	**d1 ... dn**	
	Hex	1D	6B	**m**	**n**	**d1 ... dn**	
	Decimal	29	107	**m**	**n**	**d1 ... dn**	

[Range] (A) 0 ≤ **m** ≤ 6 (**k** and **d** depend on the bar code system used)

(B) 65 ≤ **m** ≤ 73 (**n** and **d** depend on the bar code system used)

[Description]

Prints the bar code using the bar code system specified by **m**.

m		**Bar code system**	**Bar code data (“SP” in the table indicates space.)**			
			Amount of data	**The range of k**	**Characters**	**Character code (d)**
(A)	0	UPC-A	Fixed	11 ≤ **k** ≤ 12	0~9	48 ≤ **d** ≤ 57
	1	UPC-E	Fixed	11 ≤ **k** ≤ 12	0~9	48 ≤ **d** ≤ 57
	2	EAN13 (KAN13)	Fixed	12 ≤ **k** ≤ 13	0~9	48 ≤ **d** ≤ 57
	3	EAN8 (KAN8)	Fixed	7 ≤ **k** ≤ 8	0~9	48 ≤ **d** ≤ 57
	4	CODE39	Can be changed	1 ≤ **k**	0~9, A~Z SP, $, %, *, +, -, ., /	48 ≤ **d** ≤ 57, 65 ≤ **d** ≤ 90, **d** = 32,36,37,42,43,45,46, 47
	5	ITF (Interleaved 2 of 5)	Can be changed	1 ≤ **k** (even number)	0~9	48 ≤ **d** ≤ 57
	6	CODABAR (NW7)	Can be changed	1 ≤ **k**	0~9, A~D, a~ d, $, +, -, ., /,:	48 ≤ **d** ≤ 57, 65 ≤ **d** ≤ 68, 97 ≤ **d** ≤ 100 **d** = 36,43,45,46,47,58

(B)	65	UPC-A	Fixed	11 ≤ **n** ≤ 12	0~9	48 ≤ **d** ≤ 57
	66	UPC-E	Fixed	11 ≤ **n** ≤ 12	0~9	48 ≤ **d** ≤ 57
	67	EAN13 (KAN13)	Fixed	12 ≤ **n** ≤ 13	0~9	48 ≤ **d** ≤ 57
	68	EAN8 (KAN8)	Fixed	7 ≤ **n** ≤ 8	0~9	48 ≤ **d** ≤ 57
	69	CODE39	Can be changed	1 ≤ **n** ≤ 255	0~9, A~Z SP, $, %, *, +, -, ., /	48 ≤ **d** ≤ 57, 65 ≤ **d** ≤ 90, **d** = 32,36,37,42,43,45,46, 47
	70	ITF (Interleaved 2 of 5)	Can be changed	1 ≤ **n** ≤ 255 (even number)	0~9	48 ≤ **d** ≤ 57
	71	CODABAR (NW7)	Can be changed	1 ≤ **n** ≤ 255	0~9, A~D, a~ d, $, +, -, ., /,:	48 ≤ **d** ≤ 57, 65 ≤ **d** ≤ 68, 97 ≤ **d** ≤ 100 **d** = 36,43,45,46,47,58
	72	CODE93	Can be changed	1 ≤ **n** ≤ 255	00H~7FH	0 ≤ **d** ≤ 127
	73	CODE128	Can be changed	1 ≤ **n** ≤ 255	00H~7FH	0 ≤ **d** ≤ 127

• **k** of (A) indicates the number of bytes of bar code data . **k** is an explanation parameter; therefore it does not need to be transmitted.
• **n** of (B) specifies the number of bytes of bar code data.
• **d** specifies the character code data of the bar code data to be printed.

[Notes]

■ When standard mode is selected, this command is enabled only when the print position is the head of a line or when no data exists in the print buffer.
■ When page mode is selected, this command develops the bar code data in the print buffer but the printer does not print the bar code data.
■ The bar code width that exceeds the print area cannot be specified.

■ This command feeds as much paper as is required to print the bar code, regardless of the line spacing specified by line space setting commands.

■ The bar code is not affected by print mode (emphasized, underline, or 90° clockwise-rotated), except for upside-down print mode.

■ After bar code printing, the print position moves to the left end of the print area. The printer enters the status of print position at the head of a line or no data exists in the print buffer.

■ The values of **m** from 0 to 6 in (A) and from 65 to 71 in (B) select the same bar code system, respectively. The printing results are the same.

■ This command specifies **m** = 0 to 6 and ends with a **NUL** code.

■ When an odd number of data is processed for ITF bar code system (**m** = 5), the printer ignores the last received data.

■ The printer processes **n** bytes from the next data as bar code data by this command specifying **m** = 65 to 71.

■ Print area does not include quiet zone (left/right margin) of bar code. Make sure to secure the quiet zone, using this command.

[Notes for UPC-A (**m** = 0, 65) process]

■ Modular check character (1 character) is processed as follows:

- Automatically added when processing data is 11 byte.
- The 12th byte data is processed as a modular check character when processing data is 12 byte. In this case, modular check character is not checked.

■ Left guard bar/center bar/right guard bar are added automatically.

[Notes for UPC-E (**m** = 66) process]

■ The first data (**d1**) is processed as number system character (NSC) so 0 must be specified.

■ If **n** is out of the specified range or if **n** is an odd number when ITF bar code system (**m** = 70) is selected, this command is canceled and the following data is processed as normal data.

■ Modular check character (1 character) is processed as follows:

• Automatically added when processing data is 11 byte.

• The 12th byte data is processed as a modular check character when processing data is 12 byte. In this case, modular check character is not checked.

• Modular check characters are data to decide bar code pattern, they are not included printing data.

■ Prints a 6-column short code from 10 digit (**d2...d11**) except NSC and modular check characters.

Data of transmitted by host PC										**Printing data**					
d2	***d3***	***d4***	***d5***	***d6***	***d7***	***d8***	***d9***	***d10***	***d11***						
0 ~ 9	0 ~ 9	0	0	0	-	-	0 ~ 9	0 ~ 9	0 ~ 9	***d2***	***d3***	***d9***	***d10***	***d11***	0
0 ~ 9	0 ~ 9	1	0	0	-	-	0 ~ 9	0 ~ 9	0 ~ 9	***d2***	***d3***	***d9***	***d10***	***d11***	1
0 ~ 9	0 ~ 9	2	0	0	-	-	0 ~ 9	0 ~ 9	0 ~ 9	***d2***	***d3***	***d9***	***d10***	***d11***	2
0 ~ 9	0 ~ 9	3 ~ 9	0	0	-	-	-	0 ~ 9	0 ~ 9	***d2***	***d3***	***d4***	***d10***	***d11***	3
0 ~ 9	0 ~ 9	0 ~ 9	1 ~ 9	0	-	-	-	-	0 ~ 9	***d2***	***d3***	***d4***	***d5***	***d11***	4
0 ~ 9	0 ~ 9	0 ~ 9	0 ~ 9	1 ~ 9	-	-	-	-	0 ~ 9	***d2***	***d3***	***d4***	***d5***	***d6***	***d11***

Specify 0 at indicated data by "-" in the table.

When 1 ≤ **d6** ≤ 9, be sure to specify (5 ≤ **d11** ≤ 9).

■ Left guard bar/right guard bar are added automatically.

[Notes for JAN13/EAN13 (**m** = 2, 67) process]

■ Modular check character (1 character) is processed as follows:

• Automatically added when processing data is 13 byte.

• The 13th byte data is processed as a modular check character when processing data is 13 byte. In this case, modular check character is not checked.

■ Left guard bar/center bar/right guard bar are added automatically.

[Notes for JAN8/EAN8 (**m** = 3, 68) process]

■ Modular check character (1 character) is processed as follows:

• Automatically added when processing data is 7 byte.

• The 8th byte data is processed as a modular check character when processing data

is 8 byte. In this case, modular check character is not checked.

■ Left guard bar/center bar/right guard bar are added automatically.

[Notes for CODE39 (**m** = 4, 69) process]

■ The printer processes the start character (ASCII = ***/**Hex = 2Ah/Decimal = 42) as follows:

• When the first bar code (**d1**) is "*****", the printer processes the data as a first character.

• If the first bar code (**d1**) is not "*****", the printer adds a start character (*****) automatically.

■ The printer processes the start character (ASCII = ***/**Hex = 2Ah/Decimal = 42) as follows:

• When the last bar code (**dk** or **dn**) is "*****", the printer processes the data as a last character.

• If the last bar code (**dk** or **dn**) is not "*****", the printer adds a last character (*****) automatically.

• When "*****" is processed during bar code data processing, the printer processes "*****" as a stop character. The printer prints data preceding "*****" and finishes command processing. Therefore, data following "*****" are processed as normal data.

■ Check digits are not calculated and added.

[Notes for ITF (Interleaved 2 of 5) (**m** = 5, 70) process]

■ Start code and stop code are added automatically.

■ Check digits are not calculated and added.

[Notes for CODABAR (NW-7) (**m** = 6, 71) process]

■ Start character and stop character are not added automatically. Transmit data including the codes.

• Specify the start character (ASCII = "A" ~ "D," / "a" ~ "d,"/ Hex = 41H ~ 44H, 61H ~ 64H, / Decimal = 65~ 68,/ 97 ~ 100) at beginning of the data (***d1***).

• Specify the stop character (ASCII = "A" ~ "D," / "a" ~ "d,"/Hex = 41H ~ 44H, 61H ~ 64H, / Decimal = 65 ~ 68,/ 97 ~ 100) at end of the data (***dk*** or ***dn***).

• Start character or stop character (ASCII = "A" ~ "D," / "a" ~ "d,"/Hex = 41H ~ 44H, 61H ~ 64H,/ Decimal= 65 ~ 68, / 97 ~ 100) cannot be specified in bar code data.

• The character (ASCII = "a" ~ "d,"/Hex = 61H ~ 64H,/ Decimal = 97 ~ 100) is supported

by some printer models.

■ Check digits are not calculated and added.

[Notes for CODE93 (**m** = 72) process]

■ Start code and stop code are added automatically.

■ Check digits (2 character) are calculated and added automatically.

■ Special character HRI is processed as follows:

• The printer prints an HRI character "□" as start and stop character.

• The printer prints HRI characters "■ + an alphabetic character" as a control character (unprinted character).

[Notes for CODE128 (**m** = 73) process]

■ Make sure to specify start character. The start character must be code set selection character (any of CODE A, CODE B, or CODE C) which selects the first code set.

■ Stop character is added automatically.

■ In CODE A, following data can be used.

Character data: It is specified by ASCII code [in hexadecimal: 20H ~ 5FH / in decimal: 32~95]

Control character data: It is specified by ASCII code [in hexadecimal: 00H ~ 1FH / in decimal: 0~31]

Special character data: (FNC 1, FNC 2, FNC 3, FNC 4, SHIFT, CODE B, CODE C)

It is specified “{+ character code" as 2 byte. (It is described separately.)

■ In CODE B, following data can be used.

Character data: It is specified by ASCII code [in hexadecimal: 20H ~ 7FH / in decimal: 32~127]

when specify "{", transmit “{{“ as 2 byte data. (It is described separately.)

Special character data: (FNC 1, FNC 2, FNC 3, FNC 4, SHIFT, CODE A, CODE C)

It is specified “{+ character code" as 2 byte. (It is described separately.)

■ In CODE C, following data can be used.

Numerical data: It is specified each 2 digit as 1 byte by ASCII code

[in hexadecimal: 00H ~ 63H / in decimal: 0~99]

Example: When specify "012345", specify [in hexadecimal:

01H, 17H, 2DH.in decimal: 1, 23, 45] as 3 byte.
Special character data: (FNC 1, CODE A, CODE B)
It is specified “{+ character code" as 2 byte. (It is described separately.)
■ Special characters are defined by combining two characters "{ + an alphanumeric 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

■ Check digit (1 character) is calculated and added automatically.
■ Special character HRI is processed as follows:
- The printer does not print HRI characters that correspond to the shift character or code set selection character (CODE A, CODE B, or CODE C).
- HRI characters of the function characters (FNC1, FNC2, FNC3, or FNC4) and control characters (00H to 1FH and 7FH) are printed as spaces.

GS r

[Name] Transmit status

[Format]

ASCII	GS	r	**n**
Hex	1D	72	**n**
Decimal	29	114	**n**

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

[Description]

Transmits the status using **n** as follows:

n	**Function**
1, 49	Transmits paper sensor status
2, 50	Transmits drawer kick-out connector status

[Notes]

■ Each status is 1 byte.

■ The status to be transmitted is as follows:

• Paper sensor status (**n** = 1, 49)

Bit	**Binary**	**Hex**	**Decimal**	**Status**
0, 1	00	00	0	Roll paper near-end sensor: paper adequate.
	11	03	3	Roll paper near-end sensor: paper not present.
2, 3	00	00	0	Roll paper end sensor: paper present.
	11	0C	12	Roll paper end sensor: paper not present.
4	0	00	0	Not used. Fixed to Off.
5,6	—	—	—	Undefined.
7	0	00	0	Not used. Fixed to Off.

• Some paper sensors are not present, depending on the printer model.

The names of some paper sensors are different, depending on the printer model.

■ The status to be transmitted is as follows:

• Drawer kick-out connector status (**n** = 2, 50)

Bit	Binary	Hex	Decimal	Status
0	0	00	0	Drawer kick-out connector pin 3 is LOW.
	1	01	1	Drawer kick-out connector pin 3 is HIGH.
1-3	—	—	—	Undefined.
4	0	00	0	Not used. Fixed to Off.
5, 6	—	—	—	Undefined.
7	0	00	0	Not used. Fixed to Off.

■ When you use this command, obey the following rules.

• After the host PC transmits the function data, the printer will send response data or status data back to the PC. Do not transmit more data from the PC until the response data or status data are received from the printer.

• When operating with a serial interface, be sure to configure operation so that the host computer uses the printer only when it is READY.

• With a parallel interface, a real-time status is stored in the transmission buffer of the printer temporarily the same as the other transmission data (except for ASB status), and when the host enters reverse mode, data is transmitted in order from the beginning of the transmission buffer. The transmission buffer is 99 bytes; therefore, data that exceeds 99 bytes is ignored. When using this command, the host should be changed to the reverse mode immediately and execute a receive processing of status.

■ After the print changing line operation ends, paper sensor status (**n** = 1, 49) is transmitted. Therefore if use **GS r 1** according to the printing instruction, host recognizes the print completion by receiving paper sensor status.

■ Normal status can be differentiated by the information of bits 4, and 7 from other transmission data. If the data transmitted from the printer after outputting **GS r** to the printer is “0xx1xx10”(x = 0 or 1), process the data as a normal status.

■ Paper sensor status (**n** = 1, 49)

	When the roll paper end sensor detects a paper-end, the printer goes offline and does not execute this command. Therefore, bits 2 and 3 of the paper sensor status do not transmit a paper-end status. When the roll paper cover is open, paper detection (detected by the roll paper end sensor) may be incorrect.

GS v 0

[Name] Print raster bit image

[Format]

ASCII	GS	v	0	**m**	**x_L x_H**	**y_L y_H**	**d1...dk**
Hex	1D	76	30	**m**	**x_L x_H**	**y_L y_H**	**d1...dk**
Decimal	29	118	48	**m**	**x_L x_H**	**y_L y_H**	**d1...dk**

[Range]

$0 \le \mathbf{m} \le 3, 48 \le \mathbf{m} \le 51$

$0 \le \mathbf{x_L} \le 255$

$0 \le \mathbf{x_H} \le 255$

$0 \le \mathbf{y_L} \le 255$

$0 \le \mathbf{y_H} \le 8$

$0 \le \mathbf{d} \le 255$

$\mathbf{k} = (\mathbf{x_L} + \mathbf{x_H} \times 256) \times (\mathbf{y_L} + \mathbf{y_H} \times 256)$ (except for k = 0)

[Default] None

[Description]

Prints a raster bit image using the mode specified by **m**, as follows:

m	**Mode**	**Scaling for horizontal**	**Scaling for vertical**
0, 48	Normal	× 1	× 1
1, 49	Double-width	× 2	× 1
2, 50	Double-height	× 1	× 2
3, 51	Quadruple	× 2	× 2

- **x_L**, **x_H** specifies ($x_L + x_H \times 256$) bytes in horizontal direction for the bit image.
- **y_L**, **y_H** specifies ($y_L + y_H \times 256$) dots in vertical direction for the bit image.
- **d** specifies the bit image data (raster format).
- **k** indicates the number of bit image data. **k** is an explanation parameter; therefore, it does not need to be transmitted.

[Recommended Functions]

This command is supported by only some of the printer models and will not be supported by future models. The graphics function is superior in operating to **GS v 0** for the following reasons:

• Selecting a color for printing is possible.
• Size setting in dot unit is possible.

[Notes]

■ When standard mode is selected, this command is enabled only when there is no data in the print buffer and printer is in the beginning of the line. If data exists in the print buffer, the printer processes **m** and the following data as normal data.
■ In page mode, the bit image is only stored in the print buffer and is not printed.
■ Data (**d**) specifies a bit printed to 1 and not printed to 0.
■ If a raster bit image exceeds one line, the excess data is not printed.
■ The scales for width and height of raster bit images are specified by **m**.
Therefore, in page mode with 90° or 270° clockwise-rotated raster bit image, the printer apply print area and dot density from [width:direction of paper feed, height: perpendicular to direction of paper feed].
■ The raster bit image is not affected by print modes (emphasized, double-strike, underline, character size, white/black reverse printing, upside-down printing, or 90° clockwise-rotated).
■ This command feeds as much paper as is required to print the raster bit image, regardless of the line spacing specified by **ESC 2** or **ESC 3**.
■ If this command is processed while a macro is being defined, the printer cancels macro definition, clears the definition, and prints a raster bit image.
■ After printing a raster bit image, the printer processes normal data.
The print position is set to the left of the print area. Printer is in the beginning of a line and data is not in the print buffer.

■ The relationship between bit image data and the print result is as follows

d1	**d2**	**...**	**dX**

		dX + 1	**dX** + 2	**...**	**dX** × 2	
		:	**:**	**...**	**:**	
		...	**dk-2**	**dk-1**	**dk**	**X** = (**xL** + **xH** × 256)
		MSB LSB	MSB LSB	MSB LSB	MSB LSB	

GS w

[Name] Set bar code width

[Format]

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

[Range] 2 ≤ **n** ≤ 6

[Default] **n** = 3

[Description]

Sets the horizontal size of a bar code.

- **n** specifies the bar code module width.

[Notes]

■ The units for **n** depend on the printer model.

■ This command setting is effective until performing of **ESC** @, reset or power-off.

■ Bar code types are Multi level bar code (UPC-A, UPC-E, EAN13(KAN13), EAN8(KAN8), CODE93, and CODE128) and Binary level bar code (CODE39, ITF, CODABAR(NW7).

■ **The module width differs, depending on the specification. (Unit: mm):**

n	**Module width (mm) for multilevel bar code**	**Binary level bar code**	
		Thin element width (mm)	**Thick element width (mm)**
2	**0.250 {0.010 inch}**	**0.250 {0.010 inch}**	**0.625 {0.025 inch}**
3	**0.375 {0.015 inch}**	**0.375 {0.015 inch}**	**1.000 {0.039 inch}**
4	**0.500 {0.020 inch}**	**0.500 {0.020 inch}**	**1.250 {0.049 inch}**
5	**0.625 {0.025 inch}**	**0.625 {0.025 inch}**	**1.625 {0.064 inch}**
6	**0.750 {0.030 inch}**	**0.750 {0.030 inch}**	**2.000 {0.079 inch}**

GS (k

[Name] Set up and print the symbol

[Format]

ASCII	GS	(	k
Hex	1D	28	4B
Decimal	29	49	75

[Description] Processes the data for two-dimensional codes. (QR Code)

- Symbol type is specified by cn
- Function code fn specifies the function.

cn	Fn	Function No.	Function name
49	65	**Function 165**	QR Code: Select the model
	67	**Function 167**	QR Code: Set the size of module
	69	**Function 169**	QR Code: Select the error correction level
	80	**Function 180**	QR Code: Store the data in the symbol storage area
	81	**Function 181**	QR Code: Print the symbol data in the symbol storage area
	82	**Function 182**	QR Code: Transmit the size information of the symbol data in the symbol storage area

- **pL**, **pH** specifies (**pL** + **pH** × 256) as the number of bytes after **pH** (**cn**, **fn**, and **[parameters]**).

The [parameters] are described in each function.

[Notes]

■ The function is specified with the function code (fn). Details of the performance differ according to the function.

[Notes for transmission process]

■ Transmission process is performed by <Function 182>.

When you use this command, obey the following rules.

- After the host PC transmits the function data, the printer will send response data

or status data back to the PC. Do not transmit more data from the PC until the corresponding data is received from the printer.

- When operating with a serial interface, be sure to configure operation so that the host computer uses these functions only when it is READY.
- With a parallel interface, a [Header ~ NUL] is stored at first in the transmission buffer of the printer with the other transmission data (except for ASB status). When the host enters Reverse Mode, the data is transmitted in order from the beginning. Data that exceeds the transmission buffer size (99 bytes) is ignored. When using the command, the host should enter Reverse Mode immediately and execute receive processing of status.

■ When communication with the printer uses XON/XOFF control with serial interface, the XOFF code may interrupt the “Header to NUL” data string.

■ The information for each function can be identified to other transmission data according to specific data of the transmission data block. When the header transmitted by the printer is [hex = 37H/decimal =55], treat NUL [hex = 00H/decimal =0] as a data group and identify it according to the combination of the header and the identifier.

[Notes for process of QR Code symbol (when **cn** = 49)]

■ The symbol data specified by Function 180 d1...dk is stored in the printer and is printed by the specification of Function 181. The symbol data in the symbol storage area is reserved until the following processing is performed:

- Function 080 or 180 or 280 is executed
- **ESC** @ is executed
- The printer is reset or the power is turned off

	■ When processing Function 181 or 182, the setting values of Functions 165, 167, 169 are used. If the printable area is not enough, the symbol may not be printed. ■ Executing Function 181 after executing Function 180 repeatedly prints the same symbol data. ■ By using Functions 165, 167, 169 combined with Function 181, the same symbol data d1...dk is printed differently. ■ By using Function 182, the symbol size printed by Function 181 is available.

GS (k <Function 165>

[Name] QR Code: 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 affect the processing of Functions 181 and 182.
- Settings of this function are effective until **ESC** @ is executed, the printer is reset, or the power is turned off.

GS (k <Function 167>

[Name] QR Code: 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 ≤ **n** ≤ 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 181 and 182.
- The setting unit differs, depending on the printer models.
- 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.)

GS (k <Function 169>

[Name] QR Code: 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 ≤ **n** ≤ 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 181 and 182.
- 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.

GS (k <Function 180>

[Name] QR Code: 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 ≤ (**pL** + **pH** × 256) ≤ 7092 (0 ≤ **pL**≤ 255, 0 ≤ **pH** ≤ 27)
cn = 49
fn = 80
m = 48
0 ≤ **d** ≤ 255
k = (**pL** + **pH** × 256) - 3

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

[Notes]

- Data stored in the symbol storage area by this function is processed by Functions 181 and 182. The data in the symbol storage area are reserved after processing Function 181 or 182.
- **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:

- Function 080 or 180 or 280 is executed
- **ESC** @ is executed
- The printer is reset or the power is turned off

GS (k <Function 181>

[Name] QR Code: 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 180>.

[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 180 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.

GS (k <Function 182>

[Name] QR Code: 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 180>.

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

Other information

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

- 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.)

- Size information indicates size of symbol that is printed by Function 181.

- 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 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.

FF

［Name] Print and recover to page mode

[Format]

ASCII	FF
Hex	0C
Decimal	12

[Description]

• When in page mode, this prints all buffered data to the print region collectively, then recovers to the standard mode.
• In standard mode, this prints the data in the print buffer and feeds paper to the TOF position (the black mark).

[Notes]

• In page mode, all buffer data is deleted after printing.
• In page mode, the print area set by **ESC W** (Set print region in page mode) is reset to the default setting.
• In page mode, no paper cut is executed.
• In page mode, this sets the print position to the beginning of the next line after execution.
• The TOF position (black mark) varies according to the paper used and to customer specifications.

GS FF	[Name] Top of form of mark paper [Format] ASCII GS FF Hex. 1D 0C Decimal 29 12 [Description] • Top of form of mark paper [Notes] •This command is effective only when BM is valid. This command is ignored when BM is invalid. •This command is enabled only when at the top of the line. •This command moves to the TOF position of BM.

GS 'V' m n

［Name] Paper Cut Position Feed

[Format]

Function A	ASCII	GS	V	**m**		
	Hex	1D	56	**m**		
	Decimal	29	86	**m**		
Function B	ASCII	GS	V	**m**	**n**	
	Hex	1D	56	**m**	**n**	
	Decimal	29	86	**m**	**n**	

[Range]

Function A **m** = 1, 49

Function B **m** = 66, 66; 0 ≤ **n** ≤ 255

[Default] None

[Description] Executes paper cutting specified by m, as follows:

m		**Function**
<A>	0, 48	Executes a full cut (cuts the paper completely).
	1, 49	Executes a partial cut (one point left uncut).
<B>	65	Feeds paper to (cutting position + n × vertical motion unit) and executes a full cut (cuts the paper completely).
	66	Feeds paper to (cutting position + n × vertical motion unit) and executes a partial cut(one point left uncut).

• n of <B> specify paper feed amount executed immediately before a paper cut.

[Notes] • In page mode, all buffer data is deleted after printing.

• In page mode, the print area set by **ESC W** (Set print region in page mode) is reset to the default setting.

• In page mode, no paper cut is executed.

	• In page mode, this sets the print position to the beginning of the next line after execution. • The TOF position (black mark) varies according to the paper used and to customer specifications.

GS <	[Name]	Mechanically initialize printer
	[Format]	
		ASCII GS < Hex. 1D 3C Decimal 29 60
	[Description]	Cuts paper after feeding to the TOF (black mark).
	[Notes]	•Does not affect other settings. •This command is effective in standard mode and page mode. The TOF position (black mark) varies according to the paper used and to customer specifications

GS 'A' m n

[Name] Marked Paper Form Feed Position Correct

[Format]

ASCII	GS	A	**m**	**n**
Hex.	1D	41	**m**	**n**
Decimal	29	65	**m**	**n**

[Range] 0≤**m**≤1, 48≤**m**≤49

0≤**n**≤255

[Description] Sets the amount of correction for the marked paper form feed position in relation to the initial position.

m specifies the correction direction.

M	**Print Position**
0, 48	Forward
1, 49	Reverse
2, 50	Forward, NV memory
3, 51	Reverse, NV memory

n specifies the amount of correction.

The absolute position is [**n** x basic calculation pitch] inches.

[Notes] This command is effective only when the marked paper have been selected.

This command is ignored unless it is input immediately the following marked paper form feed (**FF**,**GS FF**, **GS '<'**, paper feed switch operation, etc.).

The edge of next mark cannot go beyond the mark sensor. If a correction amount that Exceeds the marked paper edge is set, the paper form feed position is set at the end of mark.

The basic calculation pitch is set with **GS 'P'**.

	The vertical basic calculation pitch (y) is used for calculating the correction amount. If the calculation result is a fractional figure, it is compensated using the mechanism's Minimum pitch, and the remainder is discarded. Paper feed is performed to compensate during command execution. The paper feed Distance depends on the set correction amount. If choose the writing to NV memory, initialize the printer after writing to NV memory. When adjusting the paper form feed position, set the distance from the paper edge to the print start position with an enough margin. The print start position for the paper may change depending on the temperature and humidity. If setting with no margin, unprinted area or paper jam may occur. Set a margin of 3 mm or more from the paper edge. When the paper form feed position is corrected forward, note that the next mark does Not overlap with the sensor. A printing defect may occur when the paper form feed performs paper reverse. [Related Commands] **FF**, **GS 'FF'**, **GS '<'**, **GS 'P'**

GS (F pL pH a m nL nH

[Name] Set black mark adjustment value

[Format]

ASCII	GS	(	F	**pL**	**pH**	**a**	**m**	**nL**	**nH**
Hex.	1D	28	46	**pL**	**pH**	61	**m**	**nL**	**nH**
Decimal	29	40	70	**pL**	**pH**	97	**m**	**nL**	**nH**

[Range] (**pL**+**pH**x256) = 4, **pL** = 4, **pH** = 0

$1 \leq \mathbf{a} \leq 2$

m = 0,1,48,49

$0 \leq \mathbf{nL} + \mathbf{nH} \times 256 \leq 65535,\ 0 \leq \mathbf{nL} \leq 255,\ 0 \leq \mathbf{nH} \leq 255$

[Default] All adjustment values = 0

[Description]

Sets the adjustment value of the black mark detection position.

a specifies the type of adjustment value.

a	Function
1	Sets the adjustment value of the black mark detection position.
2	Sets the adjustment value of the paper cutting position after black mark detection.

m specifies the direction of adjustment.

m	Function
0, 48	Forward Direction (Paper Feed Direction)
1, 49	Reverse Direction

nL, nH specify the amount of adjustment.

[Notes] •When processing this command while defining a macro, the macro definition is Immediately terminated and the command commences with processing.

	•The black mark detection position (**a** = 1) is affected by the following command operations. •**FF** •**GS FF** •The paper cutting position after black mark detection (**a** = 2) is affected by the following command operation •**GS V m n** •Because this command is executed when processing a normal command after it is stored once in the reception buffer, there may be a delay between the reception of the command from the reception buffer to the actual operation. •On POSBANK printers, the default value of the black mark detection position is Center from the top edge of the mark so, to make it the different position as on EPSON printers, it is necessary to adjust the position using this command. •A printing defect may occur when the paper form feed performs paper reverse. [Reference] **FF, GS FF, GS V**

GS (M pL pH n m (Function Code: n = 1, 49)

[Name] Save black mark adjustment value

[Format]

ASCII	GS	(	M	**pL**	**pH**	**n**	**m**
Hex.	1D	28	4D	**pL**	**pH**	**n**	**m**
Decimal	29	40	77	**pL**	**pH**	**n**	**m**

[Range] (**pL**+**pH**x256) = 2, **pL** = 2, **pH** = 0

n = 1, 49

1 ≤ **m** ≤ 3, 49 ≤ **m** ≤ 51

[Description]

Saves the black mark adjustment value set by the **GS (F** command to the mth region in the volatile memory.

After saving to a non-volatile memory, the printer is reset.

m	**Function**
1	Saves the adjustment value to the 1st saving region of the non-volatile memory.
2	Saves the adjustment value to the 2nd saving region of the non-volatile memory.
3	Saves the adjustment value to the 3rd saving region of the non-volatile memory.

Consider the life of the non-volatile memory and avoid over-use of this command.

[Reference] **GS (F**

GS (M pL pH n m (Function Code: n = 2, 50)

[Name] Load black mark adjustment value

[Format]

ASCII	GS	(	M	**pL**	**pH**	**n**	**m**
Hex.	1D	28	4D	**pL**	**pH**	**n**	**m**
Decimal	29	40	77	**pL**	**pH**	**n**	**m**

[Range] (**pL**+**pH**x256) = 2, **pL** = 2, **pH** = 0

n = 2, 50

1 ≤ **m** ≤ 3, 49 ≤ **m** ≤ 51

[Description] Loads the m position black mark adjustment value in the volatile memory

m	**Function**
1	Loads the adjustment value from the 1st saving region of the non-volatile memory.
2	Loads the adjustment value from the 2nd saving region of the non-volatile memory.
3	Loads the adjustment value from the 3rd saving region of the non-volatile memory.

[Reference] **GS (F**

GS (M pL pH n m (Function Code: n = 3, 51)

[Name] Set black mark adjustment value auto-load when powering on

[Format]

ASCII	GS	(	M	**pL**	**pH**	**n**	**m**
Hex.	1D	28	4D	**pL**	**pH**	**n**	**m**
Decimal	29	40	77	**pL**	**pH**	**n**	**m**

[Range] (**pL**+**pH**x256) = 2, **pL** = 2, **pH** = 0

n = 3, 51

1 ≤ **m** ≤ 3, 49 ≤ **m** ≤ 51

[Description]

Validates/invalidates the black mark adjustment value auto-load when powering on. After saving the setting to the non-volatile memory, the printer is reset.

m	**Function**
0	Auto-load function invalid
1	Auto-loads the 1st adjustment value of the non-volatile memory when powering on.
2	Auto-loads the 2nd adjustment value of the non-volatile memory when powering on.
3	Auto-loads the 3rd adjustment value of the non-volatile memory when powering on

- Consider the life of the non-volatile memory and avoid over-use of this command.

[Reference] **GS (F**