Dot Impact Printer

STAR Command Specifications

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Star Micronics Co., Ltd. Special Products Operating Division

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1. GENERAL DESCRIPTION

This specifications document describes the command specifications for the STAR MODE on dot impact printers. Information contained herein applies to models with the following conditions.

Dot impact printers

• Printer head: 72 DPI (vertical direction)

• Interfaces: Parallel/RS-232C/USB/Ethernet/Wireless LAN

Paper width: 3 inch/2.25 inch/1.75 inch
Paper feed minimum pitch: 1/144 inch (0.176 mm)

< Applicable Models:>

• Individual boards: BD100, BD500

• Complete printer product: SP2000, SP500, SP700



2. COMMAND FUNCTION LIST

Standard Commands

Class	Commands	Name
Font Style and	Specify code page	
Character Set	ESC R	Specify international character set
	ESC /	Specify/cancel slash zero
	ESC 6	Switch to IBM character set #2 (only with standard specifications)
	ESC 7	Switch to IBM character set #1 (only with standard specifications)
	ESC M	Specify 7 x 9 font (half dots)
	ESC P	Specify 5 x 9 font (2P-1)
	ESC:	Specify 5 x 9 font (3P-1)
	ESC SP	Set character space
Character	SO	Specify double-wide expanded characters
Expansion	DC4	Cancel double wide printing
Settings	ESC W	Specify/cancel double-wide printing
	ESC h	Specify/cancel double-tall printing
Print Modes	ESC E	Select emphasized printing
	ESC F	Cancel emphasized printing
	ESC -	Select/cancel underline mode
	ESC	Select/cancel upperline mode
	ESC 4	Specify white/black inversion and red color printing
	ESC 5	Cancel white/black inversion/specify black color printing
	ESC GS 4	Select red/black substitute function [ESC 4/5 setting]
	SI	Select upside-down printing
	DC2	Cancel upside-down printing
	ESC RS i	Specify/cancel rotating print mode
Line Spacing	LF	Line feed
. 0	CR	Line feed (according to memory switch settings)
	ESC a	Feed paper n lines
	ESC 0	Set line feed to 1/8 inch
	ESC 1	Set line feed to 7/72 inch
	ESC z 0	Set line feed to 1/12 inch
	ESC z 1	Set line feed to 1/6 inch
	ESC A	Define n/72 inch pitch line feed
	ESC 2	Set ESC A line feed pitch
	ESC 3	Set line feed to n/216 inch line feed pitch (approximate value)
	ESC y	Set line feed to n/144 inch line feed pitch
	ESC J	Execute n/72 inch paper feed one time
	ESC I	Execute n/144 inch paper feed one time
	FF	Form feed
Page Control	ESC C	Set page length to n lines
_	ESC C 0	Set page length to n inches
	VT	Feed paper to vertical tab position
	ESC B	Set vertical tab position
	ESC N	Set bottom margin to n lines
	ESC O	Cancel bottom margin



Class	Commands	Name
Horizontal	ESC RS A	Set print region
Direction	ESC I	Set left margin
Position	ESC Q	Set right margin
	HT	Move print position to horizontal tab position
	ESC D	Set/cancel horizontal tab position
	ESC GS a	Specify position alignment
	ESC GS A	Specify absolute position
	ESC GS R	Specify relative position
Download	ESC &	Register download characters
	ESC %	Specify/cancel download characters
Bit Image	ESC K	Standard density bit image
Graphics	ESC L	Double density bit image
·	ESC ^	9 Dot bit image
Logos	ESC FS q	Register logo
· ·	ESC FS p	Print logo
Cutter Control	ESC d	Paper cut instruction
External	ESC BEL	Set pulse width for external device drive
Device Drive	BEL	External device 1 drive instruction
	FS	External device 1 drive instruction (real time)
	SUB	External device 2 drive instruction (real time)
	EM	External device 2 drive instruction (real time)
	ESC GS EM DC1	Set external buzzer drive pulse condition
	ESC GS EM DC2	Execute external buzzer drive
Status	ENQ	Inquire ENQ status
	EOT	Inquire EOT status
	ESC ACK SOH	Inquire automatic status
	ESC RS a	Set automatic status transmission conditions
	ETB	Update ETB status (check after printing)
	ESC RS E	Clear ETB counter, ETB status
Kanji characters (Note 1)	ESC p	Set to JIS Chinese character mode (Japanese specifications only)
,	ESC q	Cancel JIS Japanese character mode (Japanese specifications only)
	ESC\$	Set/cancel JIS Japanese character mode (Japanese specifications only)
	ESC s	Set two byte Kanji characters left/right spaces
	ESC t	Set 1 byte Kanji characters left/right spaces (Japanese specifications only)
	ESC r	Register Chinese download characters
	ESC u 1	Specify 16 x 16 dot [single density] Kanji characters.
	ESC u 0	Specify 16 x 16 dot [Double Density] Kanji characters
	ESC x 1	Specify two byte Kanji characters (cancel expanded Kanji characters)
	ESC x 0	Specify expanded Kanji characters (Double tall/Double high/Double high & wide)
	ESC w 1	Specify 2-byte 16 x 16 dot [Single Density] Kanji characters (Default)
	ESC w 0	Specify double high & wide Kanji characters



Class	Commands	Name
Others	RS	Ring buzzer
	CAN	Cancel print data and initialize commands
	DC3	Printer deselect
	DC1	Select printer
	ESC @	Command initialization
	ESC U	Select printing direction
	ESC GS#	Set memory switch
	ESC#	Set memory switch
	ESC?LFNUL	Reset printer and execute self print

Note 1 Kanji characters

- Japanese character control commands are ignored on models not installed with Japanese character fonts.
- All Japanese character control commands are ignored if the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

• Black Mark Related Commands

Class	Commands	Name	
Black mark	ESC d (Note 2)	Paper cut instruction	
Related	FF (Note 2)	Performs TOF operation	
commands	ESC FF	Set top of form amount after detecting black mark	
	ESC GS (F	Set top of form amount in black mark control	
	ESC RS m	Enable, disable black mark detection	

Note 2 These are commands whose operation specifications vary when the black mark function is enabled by the memory switch.

• USB Related Commands

Class	Commands	Name
USB		
Related com-		
mands		

• 2-Color Printing Related Commands

Class	Commands	Name
2-Color Printing	ESC RS C	Select/cancel 2-color printing mode
Related	ESC 4	Specify red printing
Commands	ESC 5	Specify black printing



3. COMMAND DETAILS

3-1 Explanation of Terms

· Reception buffer

The buffer for storing data (reception data) received from the host, as it is called the reception buffer.

Reception data is temporarily stored in the reception buffer, then processed sequentially.

· Line buffer

The buffer for storing image data for printing is called the line buffer.

· Line buffer full

The state in which the buffer has no more space available is called line buffer full. When the buffer is full, data in the line buffer is printed and a line feed is performed when new print data is processed. This is the same as a Line Feed.

· Top of line

The top of line is a state that satisfies the following conditions.

- A. There is currently no print data in the line buffer.
- B. The position is not specified with the horizontal direction position command.

· Printable region

This is the maximum printable area with the printer's specifications.

Print region

This is the printing area specified by a command. (Print Region ≤ Printable Region)

SBCS

This is an abbreviation of Single Byte Character Set. These are characters in languages that are displayed using the information in one byte.

In this specifications manual, it refers to the standard specifications (destination: single byte countries).

DBCS

This is an abbreviation of Double Byte Character Set. These are characters in languages that are displayed using the information in two bytes.

In this specifications manual, it refers to the Chinese character specifications such as Japan, China and Taiwan (destination: double byte countries).

• Inch

This is a unit of length. 1 inch = 25.4 mm

• MSB

This is an abbreviation of Most Significant Bit.

LSB

This is an abbreviation of Least Significant Bit.



3-2 Exception processing

1) Undefined codes

Codes from <00>H to <1F>H are targeted. When codes not defined as commands in this region are received, they are discarded.

(Ex.) If processing the data string of <30>H<31>H<03>H<32>H<0A>H<33>H, the printer will discard <03>H as an undefined code.

2) Undefined commands

When data continuing the codes of ESC and FS are codes not defined as commands, ESC and FS and subsequent codes are discarded.

(Ex.) If processing the data string of <30>H<1B>H<22>H<31>H<32>H, the printer will read and discard <1B>H<22>H as an undefined command.

3) Settings outside of the defined area

Processing values outside of the defined area in commands accompanying arguments, those commands are ignored and the preset values are unchanged. The processing of commands is terminated at the point values outside of the defined region are processed in arguments having a plurality of commands.

(Ex.) If processing the data string of <1B>H<52>H<15>H, the printer will discard the data string of <1B>H<52>H<15>H because although <1B>H<52>H is defined as a commands (ESC R), the argument <15>H is outside of the definition. Therefore, the international character set that is already set experiences no change.



3-3 Standard Command Details

3-3-1 Font style and character set

ESC GS t n

[Name] Select code page

[Code] ASCII ESC GS t n Hexadecimal 1B 1D 74 n Decimal 27 29 116 n

[Defined Area] n differs depending on the specifications. (See the table below.)

[Initial Value] Memory switch setting

[Function] Specifies the code page according to the value of n.

When installed with Japanese, Chinese and Taiwanese language charaters and DBCS setting, this

commandis ignored.

Specifications		n		
Spec. 1	0 <u>≤</u> n <u>≤</u> 21	32 <u>≤</u> n <u>≤</u> 34	64 <u>≤</u> n <u>≤</u> 79	
Spec. 2	0 <u>≤</u> n <u>≤</u> 21	32 <u>≤</u> n <u>≤</u> 34	64 <u>≤</u> n <u>≤</u> 79	96 ≦ n ≦ 102

	Code Doge
n	Code Page
0	Normal*
1	CodePage437 (USA,Std. Europe)
	/ IBM Character Set #2
2	Katakana
3	IBM Character Set #1
4	Codepage 858 (Multilingual)
5	Codepage 852 (Latin-2)
6	Codepage 860 (Portuguese)
7	Codepage 861 (Icelandic)
8	Codepage 863 (Canadian French)
9	Codepage 865 (Nordic)
10	Codepage 866 (Cyrillic Russian)
11	Codepage 855 (Cyrillic Bulgarian)
12	Codepage 857 (Turkish)
13	Codepage 862 (Israel (Hebrew))
14	Codepage 864 (Arabic)
15	Codepage 737 (Greek)
16	Codepage 851 (Greek)
17	Codepage 869 (Greek)
18	Codepage 928 (Greek)
19	Codepage 772 (Lithuanian)
20	Codepage 774 (Lithuanian)
21	Codepage 874 (Thai)

n	Code Page
32	Codepage 1252 (Windows Latin-1)
33	Codepage 1250 (Windows Latin-2)
34	Codepage 1251 (Windows Cyrillic)
64	Codepage 3840 (IBM-Russian)
65	Codepage 3841 (Gost)
66	Codepage 3843 (Polish)
67	Codepage 3844 (CS2)
68	Codepage 3845 (Hungarian)
69	Codepgae 3846 (Turkish)
70	Codepage 3847 (Brazil-ABNT)
71	Codepage 3848 (Brazil-ABICOMP)
72	Codepage 1001 (Arabic)
73	Codepage 2001 (Lithuanian-KBL)
74	Codepage 3001 (Estonian-1)
75	Codepage 3002 (Estonian-2)
76	Codepage 3011 (Latvian-1)
77	Codepage 3012 (Latvian-2)
78	Codepage 3021 (Bulgarian)
79	Codepage 3041 (Maltese)
96	Thai Character Code 42 (Thai)
97	Thai Character Code 11 (Thai)
98	Thai Character Code 13 (Thai)
99	Thai Character Code 14 (Thai)
100	Thai Character Code 16 (Thai)
101	Thai Character Code 17 (Thai)
102	Thai Character Code 18 (Thai)

See each printer's product specifications manual for details on the memory switch settings.



ESC R n

[Name] Specify international character set [Code] ASCII **ESC** Hexadecimal 1B 52 n n

Decimal 27 82

[Defined Area] $0 \le n \le 14$

n = 64

[Initial Value] Memory switch setting

[Function] Specifies international characters according to the value of n.

n	International Characters		
0	USA		
1	France		
2	Germany		
3	UK		
4	Denmark		
5	Sweden		
6	Italy		
7	Spain		
8	Japan		
9	Norway		
10	Denmark II		
11	Spain II		
12	Latin America		
13	Korea		
14	Ireland		
64	Legal		

See each printer's product specifications manual for details on the memory switch settings.

Note that if the code page 3041 (Maltese) is selected for the code page, international characters are disabled and the specified characters of code page 3041 are printed.

ESC / N

[Name] Specify/cancel slash zero [Code] ASCII ESC n

Hexadecimal 1B 2F n Decimal 27 47

[Defined Area] n = 0, 1, 48, 49[Initial Value] Memory switch setting

[Function] Specifies/cancels slash zero according to the value of n.

n	Setting	
0, 48	Cancels slash zero	
1, 49	Specifies slash zero	

See each printer's product specifications manual for details on the memory switch settings.



ESC₆

[Name] Switch to IBM character set #2

[Code] ASCII ESC 6 Hexadecimal 1B 36

Decimal 27 54

[Defined Area] ---[Initial Value] ----

[Function] Switches from IBM character set #1 to #2.

The subsequent <80> H to <9F> H codes are handled as character data.

When the character code table settings are for the IBM character set #1, this command is ignored.

This command is only effective in the standard mode.

ESC₇

[Name] Switch to IBM character set #1

[Code] ASCII ESC 7 Hexadecimal 1B 37

Decimal 27 55

[Defined Area] ---[Initial Value] ---

[Function] Switches from IBM character set #2 to #1.

The subsequent <80> H to <9F> H codes are handled as control codes.

When the character code table settings are for the IBM character set #2, this command is ignored.

This command is only effective in the standard mode.



ESC M

[Name] Specify 7 x 9 font (half dots) (default)

[Code] ASCII ESC M

Hexadecimal 1B 4D Decimal 27 77

[Defined Area] ---[Initial Value] ---

[Function] Specifies 7 x 9 (half) dot font.

Sets the number of printable digits in one line to [total half dot count/(10 + character right space amount).

ESC P

[Name] Specify 5 x 9 font (2P-1) [Code] ASCII ESC F

> Hexadecimal 1B 50 Decimal 27 80

[Defined Area] ---[Initial Value] ---

[Function] Specifies 5×9 (2 pulse = 1) dot fonts.

Sets the number of printable digits in one line to [total half dot count/(12 + character right space amount).



ESC:

[Name] Specify 5 x 9 font (3P-1) [Code] ASCII ESC :

Hexadecimal 1B 3A Decimal 27 58

[Defined Area] ---[Initial Value] ----

[Function] Specifies 5×9 (3 pulse = 1) dot fonts.

Sets the number of printable digits in one line to [total half dot count/(18 + character right space amount).

ESC SP n

[Name] Specify character space

[Code] ASCII ESC SP n

Hexadecimal 1B 20 n Decimal 27 32 n

[Defined Area] $0 \le n \le 15$ [Initial Value] n = 0

[Function] Sets right space of characters with n half dots.

When in horizontal double-wide printing, the right space is also double.



3-3-2 Character Expansion Settings

SO

[Name] Specify double-wide expanded characters

[Code] ASCII SO

Hexadecimal 0E Decimal 14

[Defined Area] ---

[Initial Value] Cancel double-wide expanded characters

[Function] Prints ANK characters and Kanji characters with characters expanded twice the normal width.

This command is equivalent to ESC W n (n = 1).

DC4

[Name] Cancel double wide printing

[Code] ASCII DC4

Hexadecimal 14 Decimal 20

[Defined Area] ---

[Initial Value] Cancel double-wide expanded characters

[Function] Cancels horizontal double-wide printing if the following commands specify horizontal double-wide printing.

• Double horizontal double-wide printing specifying command (SO)

• Specify/cancel the horizontal double-wide printing (ESC W)

This command is equivalent to ESC W n (n = 0).



ESC W n

[Name] Specify/cancel expanded double-wide printing

[Code] ASCII ESC W n

Hexadecimal 1B 57 n Decimal 27 87 n

[Defined Area] n = 0, 1, 48, 49

[Initial Value] n = 0 (Horizontal double-wide printing cancelled)

[Function] Specifies/cancels horizontal double-wide printing for ANK characters and Kanji characters, according to an n

∕alue.

n	Function	
0, 48 Cancel double wide printing		
1, 49	Specify double-wide expanded printing	

ESC h n

[Name] Specify/cancel expanded double-tall printing

[Code] ASCII ESC h n

Hexadecimal 1B 68 n Decimal 27 104 n

[Defined Area] n = 0, 1, 48, 49

[Initial Value] n = 0 (vertical double-tall printing cancelled)

[Function] Specifies/cancels vertical double-tall printing for ANK characters, according to an n value.

n	Function	
0, 48	Cancel printing double high expanded character height	
1, 49	Specify double-tall expanded printing	

Double high & wide expanded character printing is possible by combining the double-wide and double-tall expanded character commands.

The line feed amount including the expanded double-tall characters is twice the normal amount. However, in standard specifications, only the line feed amount is doubled for font configurations of 6 x 12 IBM block graphic characters.

When double-tall expanded characters and normal printing are mixed in the same line, they are aligned at the bottom. Double-tall expanded is effective only for ANK characters, and not effective for Kanji characters.



Print mode

ESC E

[Name] Select emphasized printing [Code] **ESC**

Hexadecimal 1B 45 69 Decimal 27

[Defined Area]

[Initial Value] Emphasized printing cancelled.

[Function] Specifies emphasized printing for subsequent data.

When in emphasized printing, data is printed in two passes.

This command is effective for both ANK characters and Kanji characters (prints with four passes for 2 pass Kanji characters, and with 8 passes for 4 pass Kanji characters).

ESC F

[Name] Cancel emphasized printing [Code] **ESC** ASCII F

Hexadecimal 1B 46 Decimal 27 70

[Defined Area]

[Initial Value] Emphasized printing cancelled.

[Function] Cancels emphasized printing for subsequent data.



ESC - n

[Name] Specify/cancel underling mode [Code] ASCII ESC - n

Hexadecimal 1B 2D n Decimal 27 45 n

[Defined Area] n = 0, 1, 48, 49

[Initial Value] n = 0 (Underline cancelled)

[Function] Specifies underline according to the value of n.

n	Function	
0, 48	Cancels underline	
1, 49	Specifies underline	

Underlines are applied to the 9th dot of the character.

Underlines are not applied to horizontal tabs and to specified horizontal direction positions.

When double-wide expanded characters have been specified, the underline is also expanded, but if double-tall expanded characters have been selected, the underline does not expand in the vertical direction. It remains a one-dot line. This command is enabled for ANK characters and Kanji characters and is ineffective for block graphic characters.

ESC n

[Name] Specify/cancel upperline

[Code] ASCII ESC _ n

Hexadecimal 1B 5F n Decimal 27 95 n

[Defined Area] n = 0, 1, 48, 49

[Initial Value] n = 0 (Upperline cancelled)

[Function] Specifies upperline according to the value of n.

n	Function	
0, 48	Cancels upperline	
1, 49	Specifies upperline	

Upperlines are applied to the 1st dot of the character.

Upperlines are not applied to horizontal tabs and to specified horizontal direction positions.

When double-wide expanded characters have been specified, the upperline is also expanded, but if double-tall expanded characters have been selected, the upperline does not expand in the vertical direction. It remains a one-dot line. This command is enabled for ANK characters and Kanji characters and is ineffective for block graphic characters.



ESC 4

[Name] Specify white/black inversion and red color printing

[Code] ASCII ESC 4

Hexadecimal 1B 34 Decimal 27 52

[Defined Area]

[Initial Value] White/black inversion cancelled/black color printing specified

[Function] The following shows the details of this command. They vary according to the model.

Spec. 1

• Specifies white/black inverted printing (only on models that do not handle two color printing) Subsequent characters are printed, including the character pitch, with white and black inverted.

Printing is uni-directional. (SP2000, BD100) Precautions for Use of This Command

(1) This command is enabled for ANK characters only. White/black is not inverted for Kanji characters and block graphic characters.

- (2) Do not use this command when ANK fonts are set to 5 x 9 (3P=1) (Print quality is not guaranteed.)
- (3) When the ANK font setting is 5×9 (2P=1), and character spacing is set to an odd number, the gap between characters will open, so set the character space to an even value.
- Specifies red color printing (only on models that handle two color printing)

Subsequent characters are printed in red.Red and black characters can be mixed on the same line.

This command is enabled for all print data (ANK characters, Kanji characters and bit images).

When switched to red colored, printing is uni-directional.

Spec. 2

This command function is based on the selection of red/black substitute function.

The red/black substitute function is selected by the memory switch or the command <ESC> <GS> "4" m n. For details on selecting the red/black substitute function using a command, see the explanation of <ESC> <GS> "4" m n below, and for details on selecting the red/black substitute function using the memory switch, see the printer specifications manual.

ESC 5

[Name] Cancel white/black inversion/specify black color printing

[Code] ASCII ESC 5

Hexadecimal 1B 35 Decimal 27 53

[Defined Area] ---

[Initial Value] Cancel white/black inverted printing/specify black printing

[Function] The following shows the details of this command. They vary according to the model.

Spec. 1

Cancels white/black inverted printing (only on models that do not handle two color printing)

Cancels white/black inverted printing

Specifies black printing (only on models that handle two color printing)

Cancels red color printing and prints subsequent data in black.

Spec. 2

This command function is based on the selection of red/black substitute function.

The red/black substitute function is selected by the memory switch or the command <ESC> <GS> "4" m n. For details on selecting the red/black substitute function using a command, see the explanation of <ESC> <GS> "4" m n below, and for details on selecting the red/black substitute function using the memory switch,

see the printer specifications manual.



ESC GS 4 m n

[Name] Select red/black substitute function [ESC 4/5 setting]

[Code] ASCII ESC GS 4 m n

Hexadecimal 1B 1D 34 m n Decimal 27 29 52 m n

[Defined Area] m = 1, 2, 49, 50

When $m = 1, 49 \quad n = 0 \text{ to } 3, 255$ When $m = 2, 50 \quad n = 0, 2 \text{ to } 5$

When m = 83 n = 0, 1

[Initial Value] Memory switch setting

[Function] Selects red/black substitute function

Selects characters targeted for adornment with m = 1 (ANK) or m = 2 (Kanji characters), and selects the

<ESC> "4"/<ESC> "5" command functions with n.

Sets the handling of adornment to space characters (ASCII 20Hex) with m = 83 ("S").

This command is enabled only when in a state where adornment is cancelled by <ESC> "4" (when <ESC> "5"

was specified).

When m = 1, 48 ("1") Targeted characters = ANK

m	n	<esc> "4"/<esc> "5" Command Functions (ANK)</esc></esc>	
1,49	0	White/black inverted printing (1 Pass)	
1,49	1	<option 1=""> White/black inversin (5 x 9 font print) + enhancing (2 passes)</option>	
1,49	2	<option 2=""> Upper line + Underline + enhancing (2 passes)</option>	
1,49	3	<option 3=""> Upper line + Underline + double tall expanded + enhancing (4 passes)</option>	
1,49	255	No adornment	

When m = 2, 50 ("2") Targeted characters = Kanji characters

m	n	<esc> "4"/<esc> "5" Command Functions (Kanji characters)</esc></esc>	
2,50	0	No adornment	
2,50	2	<option 2=""> Upper line + Underline + enhancing (4 passes)</option>	
2,50	3	<option 3=""> Upper line + Underline + double tall expanded + enhancing (4 passes)</option>	
2,50	4	<option 4=""> White/Black Inverted + Double-Tall (2 passes)</option>	
2,50	5	<pre><option 5=""> White/Black Inverted + 4 X Expanded (2 passes)</option></pre>	

When using <ESC> "5" to cancel adornments, it returns to the previously set adornments. (Adornments such as underline, upper line, double-tall expanded and enhancing are cancelled if there is no command to set them (for example the <ESC> "-" 1 specification for underlines).

Precautions for selecting < Option 1>

- 1. Prints white/black inverted characters using 5 x 9 fonts regardless of the current font size setting.
- 2. Inserts a one dot string of black printing to the head of the white/black inverted characters
- 3. Printing data created on a conventional red/black printer, using 1 and 2 above, there are cases in which the printing position will shift to the right and a line of printable characters reduced.
- 4. Download registered characters defined with 5 x9 fonts are printed regardless of the current font setting (7x9/5x9).
- 5. Must not set "ANK default dot count = many" with the memory switch. (This will cause a white line to appear between characters.)

Precautions for selecting < Option 2> and < Option 3>

Do not apply an upper line or an underline when rotating 90 or 270 degrees.



When m = 83 ("S") Red/black adornment of ANK space characters (20H).

m	n	Red adornment of ANK space characters (20H).	
83	0	Adorn	
83	1	Do not adorn	

This parameter specifies whether to adorn red/black for ANK space characters in red printing mode (black/white inverted).

The ANK space characters are limited to ASCII code 20H in this setting. In the character code table, if 7FHex is a space character, 7FHex is a target for this setting.

The following is an example of each setting. It is possible to avoid unnecessary adornment in printing patterns that provide spacing of printing positions with ANK space characters (20H) when red is specified.

(Print Example)

<Condition 1> ANK adornment = "black/white inverted printing," ANK space characters = "red/black adornment"



<Condition 1> ANK adornment = "black/white inverted printing," ANK space characters = "no red/black adornment"



\$1234



SI

[Name] Select upside-down printing

[Code] ASCII SI

Hexadecimal 0F Decimal 15

[Defined Area] ---

[Initial Value] Upside-down printing cancelled

[Function] Specifies upside-down printing

This command is enabled only when at the top of the line. Therefore, upside down and right-side up

characters cannot both exist in the same line.

This command is enabled for following.

ANK charactersKanji charactersBit images

DC₂

[Name] Cancel upside-down printing

[Code] ASCII DC2

Hexadecimal 12 Decimal 18

[Defined Area] ---

[Initial Value] Upside-down printing cancelled

[Function] Cancels upside-down printing

This command is enabled only when at the top of the line.



ESC RS i n

[Name] Specify/cancel character rotated mode [Code] ASCII **ESC** RS Hexadecimal 1E 1B 69 n Decimal 27 105 30 n

[Defined Area] $0 \le n \le 2$

 $48 \le n \le 50 \text{ ("0"} \le n \le "2")$

[Initial Value] Character rotation cancelled (n = 0)

[Function] Specifies direction to rotate print (clockwise) or to cancel rotation for subsequent data, according to the n

/alue.

n	Set rotation		
0, 48	Cancelled (0° rotation)		
1, 49	270° rotation		
2, 50	270° rotation		

Rotated characters cannot be applied with underlines or upperlines.

The relationship between double-tall and double-wide is reverse to when cancelled when rotating.

When in Japanese character mode, rotation is effective for both ANK characters and Kanji characters.

Chinese character spacing is always applied with the two-byte Chinese character spacing value.

In standard specifications, rotating IBM block graphic characters is changed to vertical 8 dot fonts.

The following are precautions for 7 x 9 font character font specification.

- Characters are printed with 5 x 9 fonts (2P=1).
- Download characters registered with 5 x 9 fonts are printed.
- When rotation is cancelled, the characters return to 7 x 9 fonts. (When there is not 5 x 9 specification while rotation is specified.)

This command is effective only a font other than the Thai font is selected as the character code table.

(Rotation is automatically cancelled when the Thai character code is selected while this command is selected.)



3-3-4 Line Spacing

LF

[Name] Line feed

[Code] ASCII LF

Hexadecimal 0A Decimal 10

[Defined Area] --

[Initial Value] Set line feed to 1/6 inch

[Function] After printing data in the line buffer, paper is fed according to the currently set line feed amount.

CR

[Name] Carriage return (Print line feed)

[Code] ASCII CR

Hexadecimal 0D Decimal 13

[Defined Area] --

[Initial Value] Set line feed to 1/6 inch

[Function] Specifies the function according to the memory switch value.

Memory SW Function		Function	
	Condition (1)	Ignored	
	Condition (2)	Same as the <lf> code.</lf>	
	Condition (3)	Executes only printing, with no paper feed.	

See each printer's product specifications manual for details on the memory switch settings.



ESC a n

[Name] Feed paper n lines

[Code] ASCII ESC a n

Hexadecimal 1B 61 n Decimal 27 97 n

[Defined Area] $1 \le n \le 127$

[Initial Value] ---

[Function] After printing data in the line buffer, paper is fed according to (currently set line feed amount x n).

This paper feed amount is unaffected even if there are vertical expanded characters and double high and

wide expanded characters in one line.

ESC₀

[Name] Set line feed to 1/8 inch [Code] ASCII ESC 0

> Hexadecimal 1B 30 Decimal 27 48

[Defined Area] ---[Initial Value] 1/6 inch

[Function] Sets subsequent line feed amounts to 1/8 inch.

ESC₁

[Name] Set line feed to 7/72 inch [Code] ASCII ESC 1

Hexadecimal 1B 31

Decimal 27 49

[Defined Area] ---[Initial Value] 1/6 inch

[Function] Sets subsequent line feed amounts to 7/72 inch.



ESC_z0

[Name] Set line feed to 1/12 inch

[Code] ASCII ESC z 0 Or ESC z "0"

 Hexadecimal
 1B
 7A
 00
 1B
 7A
 30

 Decimal
 27
 122
 0
 27
 122
 48

[Defined Area] ---[Initial Value] 1/6 inch

[Function] Sets subsequent line feed amounts to 1/12 inch.

ESC_z1

[Name] Set line feed to 1/6 inch

[Code] ASCII ESC z 1 Or ESC z "1"

 Hexadecimal
 1B
 7A
 01
 1B
 7A
 31

 Decimal
 27
 122
 1
 27
 122
 49

[Defined Area] ---[Initial Value] 1/6 inch

[Function] Sets subsequent line feed amounts to 1/6 inch.



ESC An

[Name] Define n/72 inch pitch line feed [Code] **ASCII ESC** Hexadecimal 1B 41 n Decimal 27 65

[Defined Area] $0 \le n \le 85$

[Initial Value] n = 12 (1/6 inch line feed)

[Function] Defines line feed amount for one line as n/72 inch.

n

To enable this code, ESC 2 (line feed pitch setting) must be sent.

ESC₂

[Name] Set ESC A line feed pitch [Code] **ASCII ESC**

Hexadecimal 1B 32 Decimal 27 50

[Defined Area] [Initial Value]

[Function] Sets one line feed amount to the value defined by ESC A (n/72 inch pitch line feed definition).

Line feed amount is set to 1/6 inch if executing this command when ESC A (n/72 inch pitch line feed

definition) is not set.



ESC 3 n

[Name] Set line feed to n/216 inch line feed pitch (approximate value)

[Code] ASCII ESC 3

Hexadecimal 1B 33 n Decimal 27 51 n

[Defined Area] $0 \le n \le 255$ [Initial Value] n = 36 (1/6 inch)

[Function] Sets subsequent line feed amounts to a value approximate to n/216 inch.

Because the minimum pitch for the paper feed mechanism is 1/144 of an inch, the setting value will be

approximated according to the following equation.

INT (n x 2/3 + 0.5)/144 of an inch

ESC y n

[Name] Set line feed to n/144 inch line feed pitch

[Code] ASCII ESC y r Hexadecimal 1B 79 r

Hexadecimal 1B 79 n Decimal 27 121 n

[Defined Area] $0 \le n \le 255$ [Initial Value] n = 24 (1/6 inch)

[Function] Sets subsequent line feed amounts to n/144 inch.



ESC J n

[Name] Execute n/72 inch paper feed one time

[Code] ASCII ESC J n

Hexadecimal 1B 4A n Decimal 27 74 n

[Defined Area] $1 \le n \le 255$

[Initial Value] ---

[Function] After printing data in the line buffer, paper is fed n/72 of an inch in the forward paper feed direction.

This paper feed amount is unaffected even if there are vertical expanded characters and double high and

wide expanded characters in one line.

The single line feed amount setting value is not changed by this command.

ESC I n

[Name] Execute n/144 inch paper feed one time

[Code] ASCII ESC I n

Hexadecimal 1B 49 n Decimal 27 73 n

[Defined Area] $1 \le n \le 255$

[Initial Value] ---

[Function] After printing data in the line buffer, paper is fed n/144 of an inch in the forward paper feed direction.

This paper feed amount is unaffected even if there are vertical expanded characters and double high and

wide expanded characters in one line.

The single line feed amount setting value is not changed by this command.



3-3-5 Page Control Commands

FF

[Name] Form feed

[Code] ASCII FF

Hexadecimal 0C Decimal 12

[Defined Area] ---[Initial Value] ---

[Function] This command performs the following operations after the printer prints the printing data in the line buffer.

Operations are set by the memory switch.

Memory SW	Cutter Model	Tear Bar Model
Condition (1)	Executes a form feed	Executes a form feed.
Condition (2)	Feeds paper to the cutting position and performs a full cut. (*1)	Paper is fed to the tear-bar position. (*2)
Condition (3)	Executes a form feed.	Executes a form feed.
Condition (4)	Feeds paper to the cutting position and performs a partial cut. (*1)	Paper is fed to the tear-bar position. (*2)

(*1) Paper feed to cutting position: Executes a 1 inch paper feed.(*2) Paper feed to tear-bar position: Executes a 7/6 inch paper feed.

See each printer's product specifications manual for details on the memory switch settings.



ESC C n

[Name] Set page length to n lines

[Code] ASCII ESC C n

Hexadecimal 1B 43 n Decimal 27 67 n

[Defined Area] $1 \le n \le 255$ [Initial Value] 1/6 inch x 42

[Function] This command sets the length of one page to [currently set line feed amount x n] lines

The current position is the top position of the page.

The page length set using this command is unaffected by changing the form feed amount later.

Moving to the top of the page is performed using the FF (form feed) command.

If a page length is set less than the bottom margin setting value that is currently set, the page length setting

value is valid and the bottom margin setting value is cleared.

ESC C NUL n

[Name] Set page length to n inches

[Code] ASCII ESC C NUL n

Hexadecimal 1B 43 00 n Decimal 27 67 0 n

[Defined Area] $1 \le n \le 127$ [Initial Value] n = 7

[Function] This command sets the length of one page to n inches. The current position is the top position of the page.

The page length set using this command is unaffected by changing the form feed amount later.

Moving to the top of the page is performed using the FF (form feed) command.

If a page length is set less than the bottom margin setting value that is currently set, the page length setting

value is valid and the bottom margin setting value is cleared.



VT

[Name] Feed paper to vertical tab position

[Code] ASCII VT

Hexadecimal 0B Decimal 11

[Defined Area] ---[Initial Value] ----

[Function] This command performs paper feeds up to the next vertical tab position after the printer prints the data in the

line buffer.

This command is ignored if there are no tabs set.

If a vertical tab is set, and the current position is the same as the vertical tab position, or if it is below that

position, it feeds paper to the top of the next page.

ESC B n1 n2 ... nk NUL

[Name] Set vertical tab

[Code] ASCII ESC B n1 n2 .. nk NUL

[Defined Area] $1 \le n \le 255$

1 <u>≤</u> k <u>≤</u> 16

[Initial Value] (Not set)

[Function] Sets the vertical tab to (current form feed amount x n) position.

All other vertical tabs set before setting the vertical tab using this command are cancelled

A maximum of 16 vertical tabs can be set. However, the tab position must satisfy the condition of $1 \le n1 \le n2$... $\le nk$. When receiving the illegal codes that do not satisfy the condition, tabs up to the illegal code are set, but those after the illegal code are discarded up to the NUL code so illegal code tab are not set.

The vertical tab set using this command is unaffected by changing the form feed amount later.

All vertical tabs are cleared by inputting ESC B NUL.

Double high and double high & wide character specifications are unaffected when using this setting.



ESC N n

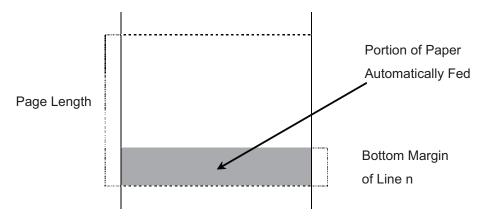
[Name] Set bottom margin to n lines [Code] ASCII ESC N n

Hexadecimal 1B 4E n Decimal 27 78 n

[Defined Area] $0 \le n \le 255$ (Not full page length)

[Initial Value] n = 0

[Function] This command sets the bottom margin position to (current line feed amount x n).



The current position when setting is effective from the next page when within the bottom margin.

The bottom margin set using this command is unaffected by changing the form feed amount later.

The set bottom margin is cleared using the "ESC N NUL" or the "ESC O" commands.

The bottom margin setting value must be a value smaller than the length of one page. If a value higher the length of the page is specified, this setting is ignored.

ESC O

[Name] Cancel bottom margin

[Code] ASCII ESC O

Hexadecimal 1B 4F Decimal 27 79

[Defined Area] --[Initial Value] Not set

[Function] This command clears the bottom margin set using the ESC N (set bottom margin to n lines).



3-3-6 Horizontal Direction Printing Position

ESC RS An

[Name] Set print region

[Code] ASCII ESC RS A n Hexadecimal 1B 1E 41 n

Decimal 27 30 65 n

[Defined Area] Specification 1 $0 \le n \le 3$

Specification 2 $0 \le n \le 5$

[Initial Value] MSW Setting

[Function] After printing data in the line buffer, this sets the printable region in the horizontal direction according to the n

value.

Setting this command partway will print the data in the line buffer at that time, perform a line feed and then take affect from the next line.

n	Print Region (Number of Dots)	Spec. 1	Spec. 2
0	210 Dots	0	0
1	160 Dots	0	0
2	200 Dots	0	0
3	150 Dots	0	0
4	190 Dots	-	0
5	180 Dots	-	0

The next horizontal position settings are all initialized.

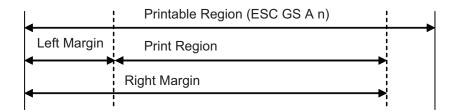
- · Left margin
- · Right margin
- · Current horizontal position
- · Horizontal tab position

The setting of this command is not initialized by <ESC> "@", <CAN>.

The horizontal position parameters are initialized by this command. Execute the commands related to position settings in the horizontal position after sending this command.

Sending example: <ESC> "@" \rightarrow <ESC> <RS> "A" n \rightarrow each command setting \rightarrow print data

The following illustrates the relationship between the printable region, and the left and right margins.





ESC I n

[Name] Set left margin

[Code] ASCII ESC I n

Hexadecimal 1B 6C n Decimal 27 108 n

[Defined Area] $0 \le n \le (right margin -2) \le 255 [Initial Setting] n = 0$

[Function]

This command sets the left margin (current ANK character pitch x n) using the left edge as a reference after printing data in the line buffer. The left edge is also the reference for upside-down printing.

Setting this command partway will print the data in the line buffer at that time, perform a line feed and then take affect from the next line.

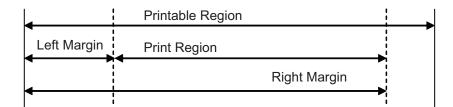
Character spacing is included in the character pitch but is unaffected by expansion settings.

The left margin set using this command is unaffected by changing the character pitch after being set.

The left margin must be at least a minimum of 18 dots. (*1)

If the printable region as set by the left and right margins is smaller than one character, including the space between characters, printing is not possible. A question mark (?) is printed instead of the character.

(*1) More than four characters of 7 x 9 fonts; more than three characters of 5 x 9 fonts (2P=1) (when character spacing = 0)





ESC Q n

[Name] Set right margin

[Code] ASCII ESC Q r

Hexadecimal 1B 51 n Decimal 27 81 n

[Defined Area] $2 \le n \le \text{maximum printable digits} \le 255$

[Initial Value] Maximum printable digits

[Function]

This command sets the printable region (current ANK character pitch x n) using the left edge as a reference after printing data in the line buffer. The left edge is also the reference for upside-down printing.

Setting this command partway will print the data in the line buffer at that time, perform a line feed and then take affect from the next line.

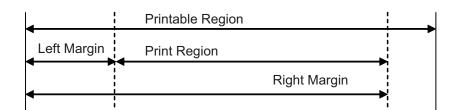
Character spacing is included in the character pitch but is unaffected by expansion settings.

The right margin set using this command is unaffected by changing the character pitch.

The print region within the defined range must be at least a minimum of 18 dots for the right margin.

If the printable region as set by the left and right margins is smaller than one character, including the space between characters, printing is not possible. A question mark ("?") is printed instead of the character.

(*1) More than four characters of 7 x 9 fonts; more than three characters of 5 x 9 fonts (2P=1) (when character spacing = 0)





HT

[Name] Move horizontal tab [Code] ASCII HT Hexadecimal 09

Hexadecimal 09 Decimal 9

[Defined Area] ---[Initial Value] ----

[Function]

Move print position to next horizontal tab position.

The current position moves to the next tab position when at the horizontal tab position.

This command is ignored with under the following conditions.

- · When there is no horizontal tab set.
- When the current position is the same as the furthest right horizontal tab position or to the right of it. In the underline/upperline modes, underlines and upperlines are not printed in the spaces created by a horizontal tab.

ESC D n1 n2 ... nk NUL

[Name] Set horizontal tab

[Code] ASCII ESC D n1 n2 .. nk NUL

Hexadecimal 1B 44 n1 n2 .. nk 00 Decimal 27 68 n1 n2 .. nk 0

[Defined Area] $1 \le n \le \text{maximum printable digits} \le 255$

 $0 \le k \le 32$

[Initial Value] Not set

[Function]

Uses the left edge as a standard to set the horizontal tab to the position of (current ANK character pitch x n).

The horizontal tab reference point is the left edge, regardless of the left and right margin settings.

The right edge is also the reference for upside-down printing.

ANK character pitches, including right spaces, are unaffected by expansion settings.

All other horizontal tabs set before setting the horizontal tab using this command are cancelled A maximum of 32 horizontal tabs can be set, but the tab position must satisfy the following conditions. If the following conditions are not met, data up to the NUL code is discarded. Normal tabs that meet the

conditions below are set and tabs after errors occur are not set.

- 1 < n1 < n2 ... < nk
- $nk \leq Printable region$

The horizontal tab set using this command is unaffected by changing the character pitch.

All horizontal tabs are cleared by inputting ESC D NUL.



ESC GS a n

[Name] Specify position alignment

[Code] ASCII ESC GS a n

 Hexadecimal
 1B
 1D
 61
 n

 Decimal
 27
 29
 97
 n

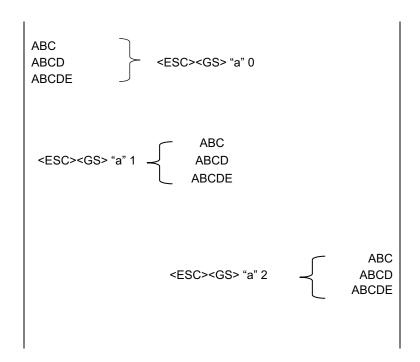
[Defined Area] $0 \le n \le 2$

 $48 \leq n \leq 50 \ (\text{``0"} \leq n \leq \text{``2"})$

[Initial Value] n = 0

[Function] This specifies position alignment for all data in one line, in the set print region.

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





ESC GS A n1 n2

[Name] Specify absolute position

[Code] ASCII ESC GS A n1 n2

 Hexadecimal
 1B
 1D
 41
 n1
 n2

 Decimal
 27
 29
 65
 n1
 n2

[Defined Area] $0 \le n1 \le 255$

 $0 \le n2 \le 255$

[Initial Value] --

[Function] Moves the printing position to the (n1 + n2 x 256) position based on the left margin.

The right margin is also the reference for upside-down printing.

This command is ignored if the print region is exceeded.

When print data is duplicated, the new print data is overwritten by the old print data. (the portion duplicated in

the new data is deleted.) However, bit image data is OR processed for the old print data.

ESC GS R n1 n2

[Name] Specify relative position

[Code] ASCII ESC GS R n1 n2

Hexadecimal 1B 1D 52 n1 n2 Decimal 27 29 82 n1 n2

[Defined Area] $0 \le n1 \le 255$

 $0 \le n2 \le 255$

[Initial Value] ---

[Function] Moves the printing position from the current position to the $(n1 + n2 \times 256)$ position.

This command is ignored if the print region is exceeded.

When $(n1 + n2 \times 256) \ge 32768$, it moves $\{65536 - (n1 + n2 \times 256)\}$ dots in the left direction.

When $(n1 + n2 \times 256) < 32768$, it moves $(n1 + n2 \times 256)$ } dots in the right direction.

When print data is duplicated, the new print data is overwritten by the old print data. (the portion duplicated in

the new data is deleted.) However, bit image data is OR processed for the old print data.



3-3-7 Download

ESC & NUL n1 n2 [m d1 d2 d3 d4 d5 (d6 d7)] n2 - n1 + 1

[Name] Register download characters (vertical 1 byte font)

[Code] ASCII ESC & NUL n1 n2 [m d1 d2 d3 d4 d5 (d6 d7)] n2 - n1 + 1

Hexadecimal 1B 26 00 n1 n2 [m d1 d2 d3 d4 d5 (d6 d7)] n2 - n1 + 1 Decimal 27 38 0 n1 n2 [m d1 d2 d3 d4 d5 (d6 d7)] n2 - n1 + 1

[Defined Area] $33 \le n1 \le n2 \le 127 (21h \le n1 \le n2 \le 7Fh)$

m = 0, 128 (00h, 80h)

 $0 \le d1$ to $d7 \le 255$

[Initial Value]

[Function] Registers download characters to the specified character code.

A maximum of 10 download characters can be registered for 7 x 9 and 5 x 9 fonts.

The range of the location to write download characters is specified by n1 and n2. When the registered

character is 1 character, n1 = n2.

If one has been already registered to an address, it is overwritten.

This command registers download characters independent to each font.

m indicates the relationship of the character pattern and the print head (see figure below).

Definition data (d1 to d7) set the bits that correspond to the dots to print to "1," and the bits that correspond to the dots that are not printed to "0."

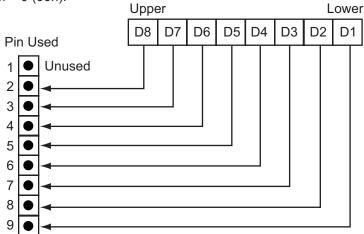
Even if ESC @ (command initialization) is executed, the registered download character is not cleared.

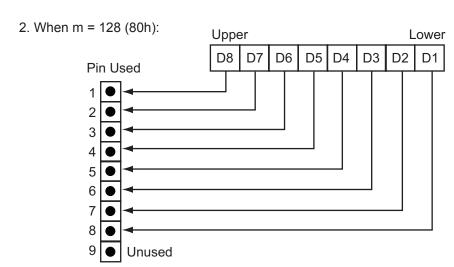
This command is effective only a font other than the Thai font is selected as the character code table.

(Composed of vertical 1 byte except for the Thai font.)

Relationship of character pattern data and print head.

1. When m = 0 (00h):



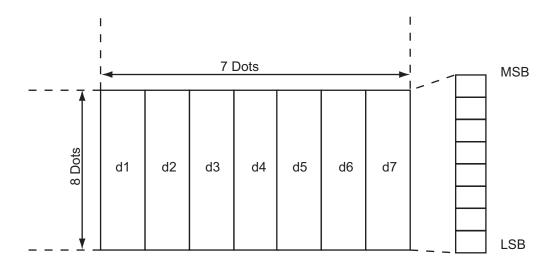


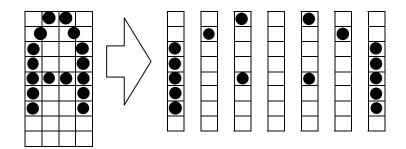
Note • When registering 7 x 9 fonts, dots adjacent in the horizontal direction do not print.

• When character rotation is specified, 7 x 9 font registered characters cannot be printed. 5 x 9 font characters are always printed.



[Ex.] When selecting 7 x 9 fonts, and defining the character to 21H:

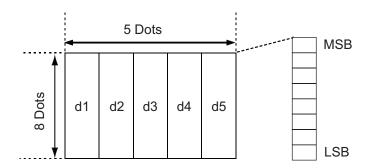


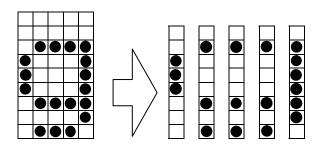


(1 when printing corresponding bits, and 0 for no print)



[Ex.] When selecting 5 x 9 fonts, and defining the character to 21H:





ESC & NUL n1 n2 m d1 d2 d3 d4 d5 Code (Hexadecimal) 1B 26 00 21 21 00 38 45 45 45 7E

(1 when printing corresponding bits, and 0 for no print)



ESC & m n1 n2 [d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 ak dk] n2 - n1 + 1

[Name] Define download characters (vertical 2 byte font)

[Code] ASCII ESC & m n1 n2 [d1 d2 d3 d4......dk-1 dk..] n2 - n1 + 1

Hexadecimal 1B 26 m n1 n2 [d1 d2 d3 d4dk-1 dk] n2 - n1 + 1Decimal 27 38 m n1 n2 [d1 d2 d3 d4dk-1 dk] n2 - n1 + 1

[Defined Area] • 7 x 9 Mode

m = 1

 $33 \le n1 \le n2 \le 127$ ($21h \le n1 \le n2 \le 7Fh$) $0 \le 1$ to 8 pins ($d1 \ d3 \ d5 \ d7 \dots dk - 1$) ≤ 255 9 pin ($d2 \ d4 \ d6 \dots dk$) = 0, 128 (00h, 80h)

k = 14 • 9 x 9 Mode

m = 2

 $33 \le n1 \le n2 \le 127 (21h \le n1 \le n2 \le 7Fh)$ $0 \le 1$ to 8 pins (d1 d3 d5 d7 ... dk -1) ≤ 255 9 pin (d2 d4 d6 ... dk) = 0, 128 (00h, 80h)

k = 18

[Initial Value] [Function]

Registers download characters to the specified character code.

Specify 1 row of data with 1 byte of 1 to 8 pins, and 1 byte of 9 pin.

It is possible to specify the ON dot up to 1 to 9 pins in the vertical direction. However, it is prohibited to specify the ON dot continuously in the horizontal direction.

A maximum of 10 download characters can be registered for 7 x 9 and 9 x 9 fonts.

The range of the location to write download characters is specified by n1 and n2. When the registered character is 1 character, n1 = n2.

If one has been already registered to an address, it is overwritten.

This command registers download characters independent to each font.

Indicates the relationship of the character pattern and the print head (see figure below).

Definition data (d1 to d7) set the bits that correspond to the dots to print to "1," and the bits that correspond to the dots that are not printed to "0."

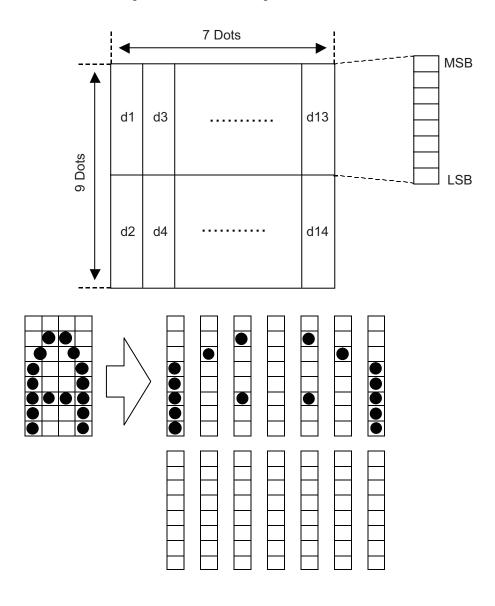
Even if ESC @ (command initialization) is executed, the registered download character is not cleared.

This command is effective only a font other than the Thai font is selected as the character code table. (Composed of vertical 2 byte when using the Thai font.)



Relationship of character pattern data and print head.

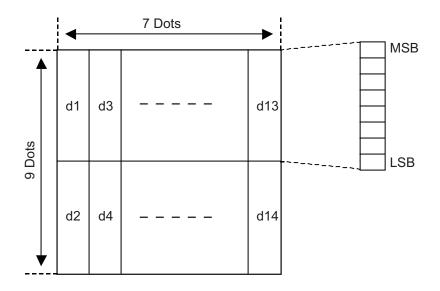
[Ex.] When selecting 7 x 9 fonts, and defining the character to 21H:

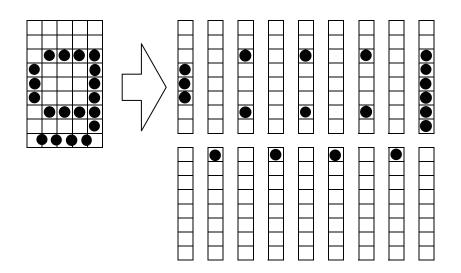


(1 when printing corresponding bits, and 0 for no print)



[Ex.:] When selecting 9 x 9 fonts, and defining the character to 21H:





ESC & m c1 c2 x d1 d2 d3 d4 d5 d6 d7 d8 d9 d10 d11 d12 d13 d14 d15 d16 d17 d18 Code (Hex.) 1B 26 02 21 21 1C 00 00 80 22 00 00 80 22 00 00 80 3F 00

(1 when printing corresponding bits, and 0 for no print)



ESC % N

[Name] Specify/cancel download characters [Code] ASCII ESC % n Hexadecimal 1B 25 n

[Defined Area] n = 0, 1, 48, 49

Decimal

[Initial Value] Cancel download character

[Function] Specifies/cancels download character according to n value.

37

n

27

n	
0, 48	Cancel download characters
1, 49	Specify download characters

<Print example of download characters>

- 1. Register download character (ESC & NUL n1 n2 m0 m1 m2...)
- 2. Specify download characters (ESC % n (n = 1))
- 3. Print download characters



Bit Image Graphics

ESC K n NUL d1 d2 ... dn

Standard density bit image [Name]

[Code] **ASCII ESC** Κ NUL d1 d2 dn n Hexadecimal 1B 4B 00 d1 d2 dn Decimal 27 75 d1 n d2 dn

[Defined Area] 1 <u>≤</u>n <u>≤</u>total dot count

 $0 \le d \le 255$

[Initial Value]

[Function] This command prints bit images with only the data count determined by n.

The amount of data that can be printed in one line is limited to the total dot count. Data that exceeds the total

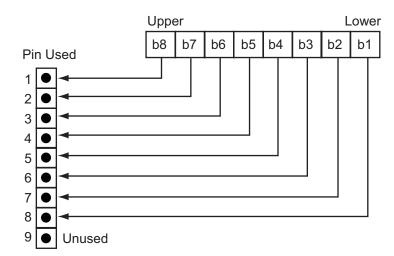
dot count or the right margin is ignored.

See each printer's product specifications manual for details regarding the total dot count.

The printing of this command is a uni-directional print (SP2000, BD100).

After printing the bit image, the printer automatically returns to the character mode.

The following drawing shows the relationship of the print head needle wires and the data.





ESC L n1 n2 d1 d2 ... dk

[Name] Double density bit image

[Code] ASCII ESC L n1 n2 d1 d2 .. dk

Hexadecimal 1B 4C d1 dk n1 n2 d2 Decimal 27 76 n1 n2 d1 d2 dk

[Defined Area] $1 \le (n1 + n2 \times 256) \le \text{total half dot count}$

 $k = n1 + n2 \times 256$

 $0 \le d \le 255$

[Initial Value] ---

[Function] This command executes the bit image of a density doubled (half dot printing) for just the data count

determined by n1 and n2.

The amount of data that can be printed in one line is only the total half-dot count. Data that exceeds the total half-dot count or the right margin is ignored. See each printer's product specifications manual for details

regarding the total half-dot count.

The relationship of the print head needle wires and the data is the same as ESC K (standard density bit image)

mage).

When printing double-density bit images, dots adjacent in the horizontal direction do not print.

The printing of this command is a uni-directional print (SP2000, BD100).

After printing the bit image, the printer automatically returns to the character mode.



ESC ^ m n1 n2 d1 d2 ... dk

[Name] 9/16/18 bit image graphics

 $[Code] \quad ASCII \qquad \quad ESC \quad ^{\wedge} \quad m \quad n1 \quad n2 \quad d1 \quad d2 \quad ... \quad dk$

Hexadecimal 1B 5E n2 d1 d2 dk m n1 Decimal 27 94 n1 n2 d1 d2 m

[Defined Area] Spec. 1

 $0 \le m \le 1 \text{ ("0"} \le m \le "1")$

Spec. 2 [9W Printer]

 $0 \le m \le 1 \text{ ("0"} \le m \le "1")$

[18W Printer]

 $0 \le m \le 5 ("0" \le m \le "5")$

 $1 \le (n1 + n2 \times 256) = printable region$

 $0 \le d \le 255$

[Initial Value]

itiai vaidoj

[Function]

This command prints bit images with only the data count determined by n1, and n2 at standard or double density.

Specify the horizontal print dot count (row) using n1 + n2 x 256 dots.

• m = 0: Print standard density 9 dot bit images.

The maximum number of dots in the horizontal direction is the total number of dots.

• m = 1: Print double density 9 dot bit images.

The maximum number of dots in the horizontal direction is the total number of half dots.

Dots adjacent in the horizontal direction do not print.

• m = 2: Print standard density 16 dot bit images.

The maximum number of dots in the horizontal direction is the total number of dots.

• m = 3: Print double density 16 dot bit images.

The maximum number of dots in the horizontal direction is the total number of half dots.

Dots adjacent in the horizontal direction do not print.

• m = 4: Print standard density 18 dot bit images.

The maximum number of dots in the horizontal direction is the total number of dots.

• m = 5: Print double density 18 dot bit images.

The maximum number of dots in the horizontal direction is the total number of half dots.

Dots adjacent in the horizontal direction do not print.

Note • Data exceeding the maximum number of dots or the right margin is ignored.

- Total number of dots and total number of half-dots follows the memory switch setting. (See the specifications manual)
- When m is outside the defined area, the following process occurs.

Spec. 1

• Data after n1 is processed as normal data.

Spec. 2

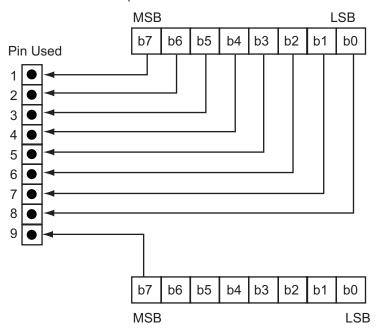
- The dots for the horizontal print dot count (row) n1 + n2 x 256 are discarded.
- When printing of the bit image is ended, the system returns to normal data processing.



The following drawing shows the relationship of the print head needle wires and the data.

1. When m = 0, 1 (9-dot bit image)

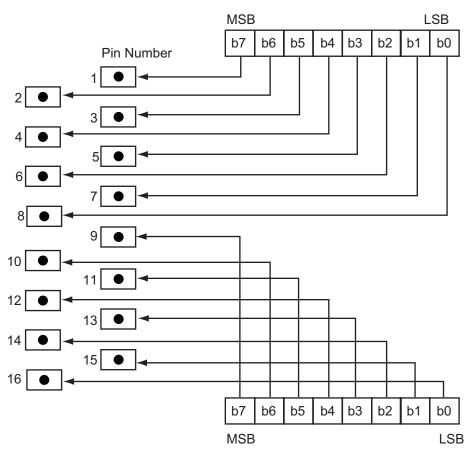
dn: 1 to 8 pin data



dn + 1: 9 pin data

2. When m = 2, 3 (16-dot bit image)

dn: 1 to 8 pin data

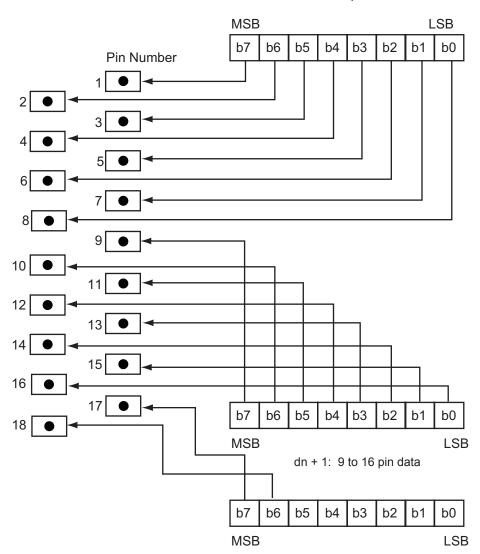


dn + 1: 9 to 16 pin data



3. When m = 4, 5 (18-dot bit image)

dn: 1 to 8 pin data



dn +2: 17 to 18 pin data



3-3-9 Logo

ESC FS q n [x11 x12 y11 y12 d1...dk]1...[xn1 xn2 yn1 yn2 d1...dk] n

[Name] Register logo

[Code] **ASCII** x12 y12 dk]1 [xn1 xn2 yn1 yn2 dk]n y11 dk]1 Hexadecimal 1B 1C 71 x12 y12 dk]n n [x11 d1 [xn1 xn2 yn1 yn2 d1 Decimal 27 28 n x12 y11 y12 dk]1 [xn1 xn2 yn1 yn2 dk]n

[Defined Area] $1 \le n \le 255$

 $0 \le xn1 \le 255, 0 \le xn2 \le 3$ $1 \le (xn1 + xn2 \times 256) \le 1023$ $0 \le yn1 \le 255, 0 \le yn2 \le 1$ $1 \le (yn1 + yn2 \times 256) \le 288$

 $0 \le d \le 255$

 $k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

[Initial Value]

[Function] Parameter details

• n: Specifies registered logo count

xn1, xn2: Horizontal size of registered logo {(xn1 + xn2 x 256) x 8} dots
 yn1, yn2: Vertical size of registered logo {(yn1 + yn2 x 256) x 8} dots

d: Registered logo datak: Logo data count

This command should be specified at the top of the line.

If there is unprinted data in the line buffer, this command is executed after printing that data at the point up to where ESC FS q is procssed.

- When the first parameter is determined to be free of error, the printer starts processing this command.
- When logo register processing starts, all previously defined data is deleted.

(It is not possible to reregister a portion of a plurality of defined logo data.)

- · Logo registration numbers are defined in rising order from 1.
- If the defined area specified by the parameter is not empty, or if there is an error in the parameter specification, register processing is exited. (The pre-registered and complete data is effective.)
- The printer should be reset if logo registration is completed or register processing is aborted.
- If an error occurs while performing register processing (the time from when the first parameter is OK until the printer initialization is completed after registering a logo), error processing, mechanical operation and status processing cannot be performed. Also, data must not be sent from the host during that time.
- This command is executed only for logo registration and does not accompany the printing operation. Logos are printed using the ESC FS p (print NV logo) command.
- The NV memory capacity is 2 Mbits (256 Kbytes = 262,144 bytes). However, 4 Kbytes (4,096 bytes) are kept as parameter information separate to the data so the data region memory capacity is 258,048 Bytes. Ex.: When the registered data size per each one is 6 Kbytes (6,144 bytes), it is possible to register 258,048/6144 = 42.

Note • If this command is used frequently, there is the possibility of damaging the non-volatile memory. Write to the non-volatile memory less than 10 times in one day.

The relationships between input data and the actual print are shown on the next page.



Relationships of logo and registered data $xn = xn1 + xn2 \times 256$, $yn = yn1 + yn2 \times 256$

 $\{(xn1 + xn2 \times 256) \times 8\}$ dots

				ļ
	d[11]	d[21]		d[n1]
(yn1 + yn2 x 256) bytes (yn1 + yn2 x 256) x 8 dots	d[12]	d[22]		d[n2]
	d[x1]	d[x2]		d[xn]

Data	
MSB	
LSB	

Data specification order (example of the above) $d[11] \; d[12] \; \cdots \quad d[x1] \; d[21] \; d[22] \; \cdots \quad d[x2] \; \cdots \cdots \quad d[n1] \; d[n2] \; \cdots \quad d[xn]$



ESC FS p n m

[Name] Print logo

[Code] ASCII ESC FS p n m

Hexadecimal 1B 1C 70 n m Decimal 27 28 112 n m

[Defined Area]

 $1 \le n \le 255$ (When printing normally)

 $0 \le m \le 3$

 $48 \le m \le 51 \text{ ("0"} \le m \le "3")$

[Initial Value]

[Function] Prints the logo of the number n registered using the logo registration command according to the print mode

m.

n: Logo Specification

n	Function	Remarks
1 to 255	Specified logo number	

m: Print Mode

m	Print Size	Horizontal Direction Dot Density	Vertical Direction Dot Density	Remarks
		(DPI) *1	(DPI)	
0, 48	Normal	Double density (169.3)	Double density (144)	
1, 49 Horizontal double size Standard density (84.7)		Double density (144)		
2, 50	Vertical double size	Double density (169.3)	Standard density (72)	
3, 51	Double high/wide	Standard density (84.7)	Standard density (72)	

- *1: The actual value of the dot pitch in the horizontal direction is 0.30 mm for standard density and 0.15 mm for double density .
- If the parameter is within the defined region, execute this command after printing the unprinted data in the line buffer.

(Unprinted data is printed regardless of whether the specified logo was registered by n.)

Therefore, it is not possible to print with other data in the same line (characters, bit images, bar codes).

• For horizontal double density, logo data that is continuously ON in the horizontal direction, the printer automatically thins out the data.

In such cases, right side data of the data that is continuously ON is forced OFF.

- Print modes, excluding upside-down printing (enhanced, double, underline, character size, black/white inverted, and 90° right rotation) are unaffected.
- · If the logo horizontal print size exceeds the print region, the portion exceeding the area is not printed.
- This command is affected by the following command settings.
 - Left margin (ESC I n)
 - Right margin (ESC Q n)
 - Position alignment (ESC GS a n)
 - Absolute position movement (ESC GS A n1 n2)
 - Absolute position movement (ESC GS R n1 n2)
 - Print region setting (ESC RS A n)
 - · Horizontal tab (HT)
 - Upside-down printing (SI)



3-3-11 Cutter Control

ESC d n

[Name] Paper cut instruction

[Code] ASCII ESC d n

Hexadecimal 1B 64 n Decimal 27 100 n

[Defined Area] $0 \le n \le 3$

 $48 \le n \le 51 \text{ ("0"} \le n \le "3")$

[Initial Value] ---

[Function] This command executes the auto-cut according to the n specification, after printing data in the line buffer.

After auto-cutter is executed, the printer considers that position to be the top of the page.

n	Auto-cutter			
0, 48	Full cut at the current position.			
	This command is ignored on tear-bar models.			
1, 49	Partial cut at the current position.			
	This command is ignored on tear-bar models.			
2, 50	Paper is fed to cutting position, then a full cut is executed. (*!)			
	On tear-bar models, paper is fed to the tear-bar position. (*2)			
3, 51	Paper is fed to cutting position, then a partial cut is executed. (*1)			
	On tear-bar models, paper is fed to the tear-bar position. (*2)			

(*1) Paper feed to cutting position: Executes a 1 inch paper feed.(*2) Paper feed to tear-bar position: Executes a 7/6 inch paper feed.

The auto-cutter function operates in the following ways on models that only have a full cut or a partial cut.

Models that perform only a full cut.
 Executes a full cut when for instructions calling

for a partial cut.

Models that perform only a partial cut.
 Executes a partial cut when for instructions calling.

for a full cut.



3-3-12 External Device Drive

ESC BEL n1 n2

[Name] Set external drive device 1 pulse width [Code] **ASCII ESC** BEL n1 n2 n2 Hexadecimal 1B 07 n1 Decimal 27 n2 n1

[Defined Area] $1 \le n1 \le 127$

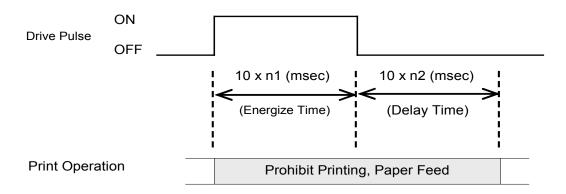
1 ≤ n2 ≤ 127

[Initial Value] n1 = 20 (Energizing time: 200 msec)

n2 = 20 (Delay time: 200 msec)

[Function] Sets the energizing and delay times for drive of the external device (such as cash drawers).

- Energizing time = 10 x n1 (ms)
- Delay time = $10 \times n2 \text{ (ms)}$



After printing, this is executed by BEL (External device 1 drive instruction) or FS (External device 1 drive instruction (real time)).

Handled in the following way when n1 and n2 are out of range.

- When n1 = 0, or n2 = 0, this command is ingored.
- When n1 > 128, n = 128, when n2 > 128, n = 128.



BEL

[Name] External device 1 drive instruction

[Code] ASCII BEL

Hexadecimal 07 Decimal 7

[Defined Area] ---[Initial Value] ---

[Function] Executes the external device drive conditions set according to the ESC BEL (external device drive pulse

width setting command).

As with other commands, this command temporarily stores data in the data buffer, then executes in the order

received.

Note External device 1 and external device 2 cannot be executed simultaneously.

FS

[Name] External device 1 drive instruction (real time)

[Code] ASCII FS

Hexadecimal 1C Decimal 28

[Defined Area] ---[Initial Value] ---

[Function] Executes the external device drive conditions set according to the ESC BEL (external device drive pulse

width setting command).

The printer executes this command immediately upon reception.

Note External device 1 and external device 2 cannot be executed simultaneously.



SUB

[Name] External device 2 drive instruction (real time)

[Code] ASCII SUB

Hexadecimal 1A Decimal 26

[Defined Area] ---[Initial Value] ---

[Function] Drives external device 2. The energizing time and delay time are fixed at 200 ms each.

The printer executes this command immediately upon reception.

This command is the same as the EM command.

Note External device 1 and external device 2 cannot be executed simultaneously.

This command is executed in real time only, so even if executed continuously, the drive occurs only once.

EM

[Name] External device 2 drive instruction (real time)

[Code] ASCII EM

Hexadecimal 19 Decimal 25

[Defined Area] ---[Initial Value] ---

[Function] Drives external device 2. The energizing time and delay time are fixed at 200 ms each.

The printer executes this command immediately upon reception.

This command is the same as the SUB command.

Note External device 1 and external device 2 cannot be executed simultaneously.

This command is executed in real time only, so even if executed continuously, the drive occurs only once.



ESC GS EM DC1 m n1 n2

[Name] Set external buzzer drive pulse condition

[Code] ASCII ESC GS EM DC1 m n1 n2

Hexadecimal 1B 1D 19 11 n2 m n1 Decimal 27 29 25 17 n2 m n1

[Defined Area] $1 \le m \le 2$ $49 \le m \le 50$

0 <u>≤</u> n1 <u>≤</u> 255

0 <u>≤</u> n2 <u>≤</u> 255

[Initial Value] n1 = 0, n2 = 0

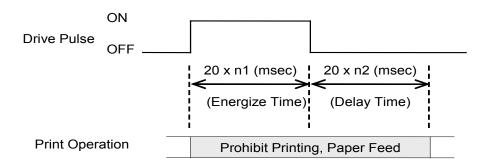
[Function] Set external buzzer drive pulse condition.

m specifies the buzzer drive terminal that sets the condition.

m	Buzzer Drive Terminals	
1, 49	Buzzer drive terminal 1	
2, 50	Buzzer drive terminal 2	

n1 specifies the energizing time; n2 specifies the delay time.

Energizing time = 20 msec x n1Delay time = 20 msec x n2



The drive of the external buzzer set by this command is performed by <ESC> <GS> <DC2> m n1 n2. The set value is not initialized by <ESC> "@", or <CAN>.



ESC GS EM DC2 m n1 n2

[Name] Execute external buzzer drive

[Code] ASCII ESC GS EM DC2 m n1 n2

 Hexadecimal
 1B
 1D
 19
 12
 m
 n1
 n2

 Decimal
 27
 29
 25
 18
 m
 n1
 n2

[Defined Area] $1 \le m \le 2$ $49 \le m \le 50$

1 <u>≤</u> n1 <u>≤</u> 20

n2 = 0

[Initial Value] ---

[Function] Repeatedly drives the buzzer according to the ON/OFF conditions set by the external buzzer drive pulse

condition command <ESC> <GS> <DC1> m t1 t2.

m specifies the buzzer drive terminal to drive.

m Buzzer Drive Terminals		Buzzer Drive Terminals
	1, 49	Buzzer drive terminal 1
	2, 50	Buzzer drive terminal 2

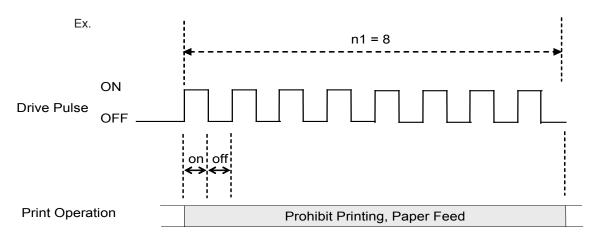
Specifies the number of times to repeat buzzer drive with (n2 x 256 + n1).

Buzzer cannot ring whle printer is printing.

This command is prohibited for use for anything other than ringing the buzzer.

(When this command is used for the drawer drive on models equipped with an external device terminal, it will be damaged, so it is absolutely prohibited.)

The buzzer can be stopped by pressing the paper feed switch while it is ringing.



(Note) When off time = 0, it is possible to ring the buzzer continuously for only the amount of n1. For example, if on = 5 seconds, and off = 0, n1 = 20 times, the buzzer will ring for 100 seconds.



3-3-13 Status

ENQ

[Name] Inquire ENQ status [Code] ASCII ENQ

Hexadecimal 05 Decimal 5

[Defined Area] ---[Initial Value] ---

[Function] This command is effective only when using an interface capable of bi-directional data communications.

When this command is received, the printer sends the 1-byte of ENQ status in real time to the host (not taking

it from the reception buffer, but executing it immediately upon reception from the host).

Bi-directional parallel interfaces enter a "data present" state. See Appendix ENQ Command Status for details regarding status.

When this command is sent once to the printer, do not send the next ENQ command until the ENQ status has

been received.

This command is not used when auto-status is valid.

EOT

[Name] Inquire EOT status [Code] ASCII EOT

Hexadecimal 04 Decimal 4

[Defined Area] ---[Initial Value] ---

[Function] This command is effective only when using an interface capable of bi-directional data communications.

When this command is received, the printer sends the 1-byte of EOT status in real time to the host (not taking

it from the reception buffer, but executing it immediately upon reception from the host).

Bi-directional parallel interfaces enter a "data present" state.

See Appendix EOT Command Status for details regarding status.

When this command is sent once to the printer, do not send the next EOT command until the EOT status has

been received.

This command is not used when auto-status is valid.



ESC ACK SOH

[Name] Inquire status

[Code] ASCII ESC ACK SOH

Hexadecimal 1B 06 01 Decimal 27 6 1

[Defined Area] ---[Initial Value] ---

[Function] This command is effective only when using an interface capable of bi-directional data communications.

When this command is received, the printer sends the status in real time to the host (not taking it from the

reception buffer, but executing it immediately upon reception from the host).

Bi-directional parallel interfaces enter a "data present" state.

See the Appendix Auto Status for details regarding status.

When in the serial interface DTR mode, and using a parallel interface, set so that the status can be inquired even when offline for errors, etc.

This command is not used when auto-status is valid.

When this command is sent once to the printer, do not send the next ESC ACK SOH command until the final

auto status has been received.

ESC RS a n

[Name] Set automatic status transmission conditions

[Code] ASCII ESC RS a n

Hexadecimal 1B 1E 61 n Decimal 27 30 97 n

[Defined Area] $0 \le n \le 3$

 $48 \le n \le 51 \text{ ("0"} \le n \le "3")$

[Initial Value] DIP switch or memory switch setting

[Function] This command is effective only on printers that have an interface capable of bi-directional data

communications.

When using serial, parallel or USB (vendor class), use is possible.

The command is ignored (set to enable auto-status) when using Ethernet or wireless LAN.

The command is ignored when using USB (printer class).

Spec. 1

Set the automatic status transmission conditions of the table below. Sends the automatic status one time.

Spec. 2

The function of this command obeys the setting of the memory switch, as shown below.

Memory switch condition (1): Set the automatic status transmission conditions of the table below.

Memory switch condition (2): Sends the automatic status one time.

Automatic Status Transmission Conditions

n	Status transmission conditions	
0, 48 Automatic status invalid		
1, 49	Automatic status valid	

See Appendix 2 for details regarding auto-status.

Settings of this command are unaffected by the ESC @ (command initialization) command.

See each printer's product specifications manual for details on the memory switch settings.



ETB

[Name] Update ETB status (check after printing)

[Code] ASCII ETB

Hexadecimal 17 Decimal 23

[Defined Area]

[Initial Value] Spec. 1 ---

Spec. 2 ETB countr = 0

[Function] This command is effective only when using an interface capable of bi-directional data communications.

Spec. 1

This command waits until all printing is completed (the print motor is stopped), and after printing is completed, the auto status printer status 1-1 (ETB command) becomes 1 (ETB execution completed).

Note that when executing this command, and print data remains the line buffer, this command is executed after printing the remaining data.

The hose checks that this bit has changed to "1" thereby making it possible to ascertain that the printing of the sent data is completed.

This ETB status bit is cleared to "0" when returned to host.

The following shows the details of the processing in the printer with this command.

- (1) Reads out the ETB command from the reception buffer. .
- (2) Waits for the printing of data to be completed before the ETB command
- (3) After checking the end of printing, the auto status ETB status is set
- (4) Auto status transmission (only when auto status is valid)

See Appendix for details regarding the auto status.

Spec. 2

This command waits until all printing is completed (the print motor is stopped), and after printing is completed, the auto status printer status 1-1 (ETB command) becomes 1 (ETB execution completed), and the ETB counter is updated (incremented).

Note that when executing this command, and print data remains the line buffer, this command is executed after printing the remaining data.

The hose checks that this bit has changed to "1" thereby making it possible to ascertain that the printing of the sent data is completed.

This ETB status bit is cleared to "0" when returned to host.

Also, ETB is appended to the end of 1 data block and several blocks are sent at once. By getting the ETB counter sequentially, it is possible to confirm the end of printing the several blocks.

Note that the ETB counter is cleared to zero by the ESC RS E command.

The following shows the details of the processing in the printer with this command.

- (1) Reads out the ETB command from the reception buffer.
- (2) Waits for the printing of data to be completed before the ETB command
- (3) After checking the end of printing, the auto status ETB status is set, and the ETB counter is incremented.
- (4) Auto status transmission (only when auto status is valid)

See Appendix for details regarding the auto status.



ESC RS E n

[Name] Initialize ASB ETB counter, and ETB status.

[Code] ASCII ESC RS E n

 Hexadecimal
 1B
 1E
 45
 n

 Decimal
 27
 30
 69
 n

[Defined Area] n = 0

n = 48 ("0")

[Initial Value] ---

[Function] Clears the ASB ETB counter to zero and clears the ETB status of the auto-status 1-1.



3-3-14 Kanji Characters (only on models that carry Kanji characters)

ESC p

[Name] Specify JIS Japanese character mode (Japanese specifications only)

[Code] **ESC ASCII** р 1B Hexadecimal

70 Decimal 27 112

[Defined Area]

[Initial Value] Select JIS Japanese character mode

[Function] Specifies JIS Japanese character mode

> When in JIS Japanese character mode, all character codes are handled as 2 byte Kanji characters (First byte: upper code; second byte: lower code). Even when setting the JIS Kanji mode, the control code is valid. This command is ignored for models not equipped with Japanese characters and when the specification for

the location of use is specified as SBCS (single byte countries) by the memory switch.

Spec. 1

When the lower code is 20h, 7Fh, it is handled as a space code.

Spec. 2

When the lower code is 20h, 7Fh, 2 bytes are ignored.

ESC q

[Name] Cancel JIS Japanese character mode (Japanese specifications only)

[Code] **ASCII ESC** q 71 Hexadecimal 1B

Decimal 27 113

[Defined Area]

[Initial Value] Cancel JIS Japanese character mode

[Function] Cancel JIS Japanese character mode

This command is ignored for models not equipped with Japanese characters and when the specification for

the location of use is specified as SBCS (single byte countries) by the memory switch.



ESC \$ n

[Name] Specify/cancel JIS Japanese character mode (Japanese specifications only)

[Code] ASCII ESC \$ n

Hexadecimal 1B 24 n Decimal 27 36 n

[Defined Area] n = 0, 1, 48, 49

[Initial Value] Memory switch setting

[Function] Specifies and cancels the shift JIS Japanese character mode.

n	JIS Japanese Character Mode	
0, 48	Cancels the shift JIS Japanese character mode (Selection of block graphics mode)	
1, 49	Specify shift JIS Japanese character mode	

When in shift JIS Japanese character mode, if the data is <80>H to <9F>H or <E0>H to <FF>H, this is handled as 2 byte Kanji characters (First byte: upper code; second byte: lower code). Even when setting the shift JIS Japanese character mode, the control code is valid.

When the shift JIS Chinese character mode is canceled, the block graphics mode is selected. At that time, if the data is <80>H to <9F>H or <E0>H to <FF>H, this is handled as 1 byte of block graphic characters.

This command is ignored for models not equipped with Japanese characters and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

See each printer's product specifications manual for details on the memory switch settings.

Spec. 1

When the lower code is 7Fh, it is handled as a space code.

Spec. 2

When the lower code is 7Fh, 2 bytes are ignored.



ESC s n1 n2

[Name] Set two byte Kanji characters left/right spaces

[Code] ASCII ESC s n1 n2

Hexadecimal 1B 73 n1 n2 Decimal 27 115 n1 n2

[Defined Area] $0 \le n1 \le 255$

 $0 \le n2 \le 255$

(However, n1 + n2 + character width ≤ printable region)

[Initial Value]

Japanese specifications
 Memory switch setting

Memory SW	n1	n2
Condition (1)	0	2
Condition (2)	0	4

· For China and Taiwan specifications

Spec. 1: n = 0, n2 = 4

Spec. 2: Memory switch setting

Memory SW	n1	n2
Condition (1)	0	4
Condition (2)	0	2

[Function]

n1, n2 specified spaces are Japanese character spaces. n1 is the left side character; n2 is the right side character.

The values of n1 and n2 when using two-byte 8 x 16, two-byte 16 x 16 and double-tall 8 x 16 characters correspond to 1/2 dots; the n1 and n2 values when using double high and wide 16 x 16 characters correspond to 1 dot.

If the Japanese character size including the right and left spaces (n1 + character width + n2) exceeds the print region, printing will not be possible and a question mark ("?") will be printed instead.

This command is ignored for models not equipped with Chinese fonts (for overseas) and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch. See each printer's product specifications manual for details on the memory switch settings.

ESC t n1 n2

[Name] Set 1 byte Kanji characters left/right spaces (Japanese specifications only)

[Code] ASCII ESC t n1 n2 Hexadecimal 1B 74 n1 n2

Decimal 27 116 n1 n2

[Defined Area] $0 \le n1 \le 255$

0 ≤ n2 ≤ 255

(However, n1 + n2 + character width ≤ printable region)

[Initial Value] Memory switch setting

Memory SW	n1	n2
Condition (1)	0	1
Condition (2)	0	2

[Function]

n1, n2 specified spaces are Japanese character spaces.n1 is the left side character; n2 is the right side character.

The values of n1 and n2 when using two-byte 8 x 16, two-byte 16 x 16 and double-tall 8 x 16 characters correspond to 1/2 dots; the n1 and n2 values when using double high and wide 16 x 16 characters correspond to 1 dot.

If the Japanese character size including the right and left spaces (n1 + character width + n2) exceeds the print region, printing will not be possible and a question mark ("?") will be printed instead.

This command is ignored for models not equipped with Japanese characters and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch. See each printer's product specifications manual for details on the memory switch settings.



ESC r c1 c2 d1...dk

[Name] Register Chinese download characters

[Code] ASCII ESC r c1 c2 d1 .. dk

Hexadecimal 1B 72 c1 c2 d1 .. dk Decimal 27 114 c1 c2 d1 .. dk

[Defined Area] $0 \le d \le 255$

k = 32

c1 and c2 differ according to specifications and code type (see table below).

[Initial Value] All spaces

[Function] Registers Japanese download characters to c1 and c2 addresses, but the following shows the possible code

range.

If one has been already registered to an address, it is overwritten.

Chinese download characters once defined are valid until redefined or the power is turned OFF.

The definition range varies according to model. (Below: Specs. 1, 2, and 3)

Spec. 1

Specifications	c1	c2	Registration count
Japanese Language Characters	c1 = 77h	20h <u>≤</u> c2 <u>≤</u> 29h	10 Characters
Kanji Characters	c1 = F8h	21h ≤ c2 ≤ 2Ah	10 Characters
Taiwan Characters	c1 = FEh	F0h ≤ c2 ≤ F9h	10 Characters

Spec. 2

Specifications	c1	c2	Registration count
Japanese Language Characters	c1 = 77h	20h <u>≤</u> c2 <u>≤</u> 29h	10 Characters
Kanji Characters	c1 = FAh	21h <u>≤</u> c2 <u>≤</u> 2Ah	10 Characters
Taiwan Characters	c1 = FEh	F0h <u>≤</u> c2 <u>≤</u> F9h	10 Characters

Spec. 3

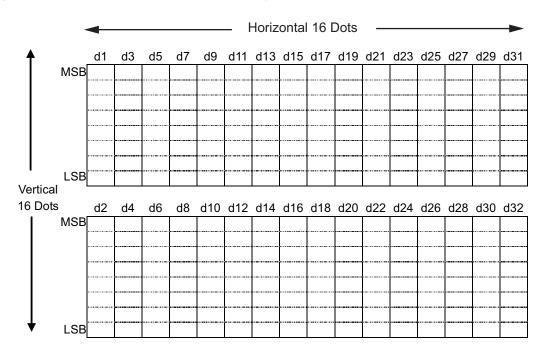
Specifications	c1	c2	Registration count
Japanese Language Characters	c1 = 77h	20h <u>≤</u> c2 <u>≤</u> 7Dh	94 Characters
Kanji Characters	FEh <u>≤</u> c1 <u>≤</u> FFh	A1h <u>≤</u> c2 <u>≤</u> FEh	94 Characters
Taiwan Characters	FEh ≤ c1 ≤ FFh	A1h ≤ c2 ≤ FEh	94 Characters

Defined Japanese download characters are accessed with two-bytes, in the same way as other Kanji characters. At that time, c1 is the first byte, c2 is the second byte.

d1, d2 • • • d32 are character data.



They are designed as shown below and data is sent sequentially.



The font of Chinese download characters is composed of 16 x 16 dot patterns.

Bits that correspond to the dots to print are "1," and the bits that correspond to the dots that are not printed are "0."



ESC u 1

[Name] Specify 16 x 16 dot [single density] Kanji characters.

[Code] ASCII ESC u 1 Or ESC u "1"

Hexadecimal 1B 75 01 1B 75 31
Decimal 27 117 1 27 117 149

[Defined Area] ---

[Initial Value] Specify two-byte 16 x 16 dot (single density) Kanji characters.

[Function] Specify 16 x 16 dot [single density] Kanji characters.

When two-bytes is selected, they become two-pass characters (state (B) to state (A))Dots continuous

horizontally are thinned for printing.

This command sets to the double-tall expanded character mode by combining with ESC x 0 (Specify

expanded Kanji characters) (state (B) \rightarrow state (C)) See "Relationship of Kanji Character Size Selection."

ESC u 0

[Name] Specify 16 x 16 dot [Double Density] Kanji characters

[Code] ASCII ESC u 0 Or ESC u "0"

 Hexadecimal
 1B
 75
 00
 1B
 75
 30

 Decimal
 27
 117
 0
 27
 117
 148

[Defined Area] ---

[Initial Value] Specify two-byte 16 x 16 dot (single density) Kanji characters.

[Function] Specify 16 x 16 dot [double density] Kanji characters.

When two-bytes is selected, they become four-pass characters (state (A) to state (B))Dots continuous

horizontally are printing.

This command sets to the 4 x expanded character mode by combining with ESC x 0 (Specify expanded Kanji

characters) (state (A) \rightarrow state (D))

See "Relationship of Kanji Character Size Selection."



ESC x 1

[Name] Specify two byte Kanji characters (cancel expanded Kanji characters)

[Code] ASCII ESC x 1 Or ESC x "1"

 Hexadecimal
 1B
 78
 01
 1B
 78
 31

 Decimal
 27
 120
 1
 27
 120
 49

[Defined Area] ---

[Initial Value] Specify two-byte 16 x 16 dot (single density) Kanji characters.

[Function] Cancels specify Chinese character expansion, and sets to two-byte Kanji characters

When 16 x 16 dot Kanji characters [single density] are selected, they become two-pass characters (state (C)

to state (A))

When 16 x 16 dot Kanji characters [double density] are selected, they become four-pass characters (state (D)

to state (B))

See "Relationship of Kanji Character Size Selection."

ESC x 0

[Name] Specify expanded Kanji characters (Double high/double high & wide)

[Code] ASCII ESC x 0 Or ESC x "0"

Hexadecimal 1B 78 00 1B 78 30 Decimal 27 120 0 27 120 48

[Defined Area] ---

[Initial Value] Specify two-byte 16 x 16 dot (single density) Kanji characters.

[Function] Sets Chinese character expansion.

When 16 x 16 dot Kanji characters [double density] are selected, they become two-pass characters (double-

tall size: state (A) to state (C))

When 16 x 16 dot Kanji characters [double density] are selected, they become horizontally and vertically

expanded characters (double high & wide size: state (B) to state (D))

See "Relationship of Kanji Character Size Selection."



ESC w 1

[Name] Specify two-byte 16 x 16 dot Kanji characters [Single Density] (Default)

[Code] ASCII ESC w 1 Or ESC w "1"

 Hexadecimal
 1B
 77
 01
 1B
 77
 31

 Decimal
 27
 119
 1
 27
 119
 49

[Defined Area] ---

[Initial Value] Specify two-byte 16 x 16 dot (single density) Kanji characters.

[Function] Cancels specify Japanese character expansion, and sets to two-byte 16 x 16 dot Kanji characters [single

density]

Kanji characters become two-pass characters (to state (A))

When the power is turned off, this is set.

See "Relationship of Kanji Character Size Selection."

ESC w 0

[Name] Specify double high & wide Kanji characters

[Code] ASCII ESC w 0 Or ESC w "0"

 Hexadecimal
 1B
 77
 00
 1B
 77
 30

 Decimal
 27
 119
 0
 27
 119
 48

[Defined Area] ---

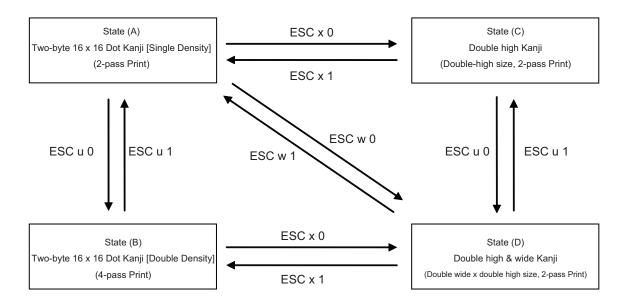
[Initial Value] Specify two-byte 16 x 16 dot (single density) Kanji characters.

[Function] Sets double high & wide (double-wide/double-high) 16 x 16 Kanji characters. (to state (D))

See "Relationship of Kanji Character Size Selection."



<Relationship of Chinese Character Size Selection>



^{*} See 5. Appendix 5-2 Expansion Position for details on the differences of dot configurations of [single density] and [double density] in two-byte 16 x 16 dot Kanji characters. This section uses a Japanese character to illustrate the difference.



3-3-15 Others

RS

[Name] Ring buzzer

[Code] ASCII RS

Hexadecimal 1E Decimal 30

[Defined Area] ---[Initial Value] ---

[Function] Issues a short buzzer sound from the printer.

CAN

[Name] Cancel print data and initialize commands

[Code] ASCII CAN

Hexadecimal 18 Decimal 24

[Defined Area] ---[Initial Value] ---

[Function] When the reception buffer and line buffer are cleared, the set commands are initialized.

Immediately executed not when taking out from the reception buffer, but when received from the host.

DIPSW and memory switch re-read is not performed.

The following shows the specifications that are not initialized by this command.

- DC1 and DC3 select/deselect status
- ESC BEL external device drive conditions
- · Auto status valid/invalid conditions



DC3

[Name] Printer deselect

[Code] ASCII DC3

Hexadecimal 13 Decimal 19

[Defined Area] ---

[Initial Value] Select printer

[Function] Deselects printer.

All received data is discarded until the next DC1 (printer select) is received.

DC1

[Name] Select printer

[Code] ASCII DC1

Hexadecimal 11 Decimal 17

[Defined Area] -

[Initial Value] Select printer

[Function] This cancels the deselect state of the DC3 (printer deselect) and selects the printer.



ESC @

[Name] Command initialization [Code] ASCII ESC

> Hexadecimal 1B 40 Decimal 27 64

[Defined Area] ---[Initial Value] ---

[Function] Initializes each command after printing data in the line buffer.

@

DIPSW and memory switch re-read is not performed.

The following shows the specifications that are not initialized by this command.

DC1 and DC3 select/deselect status

- · ESC BEL external device drive conditions
- · Auto status valid/invalid conditions
- · Sets to enable, disable black mark detection

ESC U n

[Name] Select printing direction

[Code] ASCII ESC U n

Hexadecimal 1B 55 n Decimal 27 85 n

[Defined Area] $0 \le n \le 2$

 $48 \le n \le 50 \text{ ("0"} \le n \le "2")$

[Initial Value] Standard Specifications (Memory switch: Sets SBCS) : n = 0

Japanese Character Specifications (Memory switch: Sets DBCS): n = 2 or n = 0 (*1 Depends on the model)

[Function] Executes print direction specified by this command after printing data in the line buffer.

n	Printing Direction
0, 48	Specify bi-directional printing
1, 49	Specify uni-directional printing
2, 50	Specify ANK bi-directional, Japanese character single direction (only on models in-
2, 30	stalled with Kanji characters)

Bi-directional printing is faster than uni-directional printing.

With uni-directional printing, printing is performed only when the print head moves from left to right.

When n=2, the printer prints ANK continuous printing bi-directionally. Continuous printing including Kanji characters is done in multiple passes on the first line only when the head moves from the left to the right. On the next line, it prints in a multiple of passes only when the head moves from the right to the left. However, if there are ruled lines in one line of print, or if the paper feed amount after printing exceeds 1/6 of an inch, printing is uni-directional from the left to the right.

Regarding n = 1, depending on the model, settings can be made valid or invalid using the memory switch. See each printer's product specifications manual for details on the memory switch settings.

(*1) Depends on the model

n = 2: Models that use a DC motor for the carriage motor.

n = 0: Models that use a stepping motor (logical seeking) for the carriage motor.



ESC GS # m N n1 n2 n3 n4 LF NUL

[Name] Set memory switch

[Code] ASCII ESC GS # m N n1 n2 n3 n4 LF NUL

Hexadecimal 1D 00 1B 23 m Ν n1 n2 n3 n4 0A Decimal 0 27 29 35 10 m Ν n1 n2 n3 n4

[Defined Area] m = 87, 84, 44, 43, 45 (m = "W", "T", ",", "+", "-")

 $48 \le N \le 57 \ ("0" \le N \le "9"), 65 \le N \le 70 \ ("A" \le N \le "F")$ $48 \le n1 \le 57 \ ("0" \le n1 \le "9"), 65 \le n1 \le 70 \ ("A" \le n1 \le "F")$ $48 \le n2 \le 57 \ ("0" \le n2 \le "9"), 65 \le n2 \le 70 \ ("A" \le n2 \le "F")$ $48 \le n3 \le 57 \ ("0" \le n3 \le "9"), 65 \le n3 \le 70 \ ("A" \le n3 \le "F")$ $48 \le n4 \le 57 \ ("0" \le n4 \le "9"), 65 \le n4 \le 70 \ ("A" \le n4 \le "F")$

[Initial Value] ---

[Function] Sends command to write after defining memory switch using the definition command specified by the

following classes to set the memory switch. The printer is automatically reset after writing the setting defined

by that command to the non-volatile memory.

Do not turn off the power to the printer while sending commands to the non - volatile memory. Doing so will destroy the memory switch setting. It is also possible for all memory switch settings to become offset to their

initial, default settings.

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

Function	Class	m	N	n1 n2 n3 n4
Data Definition (Data Specification)	Definition	""	N	n1 n2 n3 n4
Data definition (set specified bit)	Definition	"+"	N	n1 n2 n3 n4
Data definition (clear specified bit)	Definition	"_"	N	n1 n2 n3 n4
Definition data write and reset	Write	"W"	Fixed at "0"	Fixed at "0000"
Definition data write and reset and test print	Write	"T"	Fixed at "0"	Fixed at "0000"

• m: Mode Selection

• N: Memory switch number to specify

• n1 n2 n3 n4: Specified data m = "," → Specified data

 $m = "+" \rightarrow Bit$ number to set $m = "-" \rightarrow Bit$ number to clear

Note The status of this command varies according to the model, so check the special appendix.



ESC # N m n1 n2 n3 n4 LF NUL

[Name] Set memory switch

[Code] ASCII ESC # N m n1 n2 n3 n4 LF NUL

Hexadecimal 1B 23 Ν n1 n2 n3 n4 0A 00 m 27 0 Decimal 35 Ν m n1 n2 n3 10

[Defined Area] m = 44, 43, 45 (m = ",", "+", "-")

 $48 \le N \le 57 \ ("0" \le N \le "9"), \ 65 \le N \le 70 \ ("A" \le N \le "F")$ $48 \le n1 \le 57 \ ("0" \le n1 \le "9"), \ 65 \le n1 \le 70 \ ("A" \le n1 \le "F")$ $48 \le n2 \le 57 \ ("0" \le n2 \le "9"), \ 65 \le n2 \le 70 \ ("A" \le n2 \le "F")$ $48 \le n3 \le 57 \ ("0" \le n3 \le "9"), \ 65 \le n3 \le 70 \ ("A" \le n3 \le "F")$ $48 \le n4 \le 57 \ ("0" \le n4 \le "9"), \ 65 \le n4 \le 70 \ ("A" \le n4 \le "F")$

[Initial Value] ---

[Function] Sends command to write after defining memory switch using the definition command specified by the

following classes.

This command is set only and not changed for the current operating environment.

Changed settings are valid after the power is turned on again, or when the printer is reset.

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

Function	Class	m	N	n1 n2 n3 n4
Data Definition (Data Specification)	Definition	""	N	n1 n2 n3 n4
Data definition (set specified bit)	Definition	"+"	N	n1 n2 n3 n4
Data definition (clear specified bit)	Definition	" <u>_</u> "	N	n1 n2 n3 n4

• m: Mode Selection

• N: Memory switch number to specify

• n1 n2 n3 n4: Setting Data $m = "," \rightarrow Specified data$

 $m = "+" \rightarrow Bit$ number to set $m = "-" \rightarrow Bit$ number to clear

Note The status of this command varies according to the model, so check the special appendix.



ESC?LFNUL

[Name] Reset printer and execute self print

[Code] ASCII ESC ? LF NUL

Hexadecimal 1B 3F 0A 00 Decimal 27 63 10 0

[Defined Area] ---[Initial Value] ---

[Function] Hardware resets the printer and executes on self print.

After sending this command, the next data is not sent until the printer is online (in a state wherein it can

receive data).



3-4 Black Mark Related Commands

The Star black mark related commands are to control the top of form (black mark) functions.

This commands are effective only when black mark function is valid.

<Black mark specifications>

1. Top of form (black mark detection) operation

A. Selectable when power is turned on (reset signal is input), when self-print test is completed and by the memory switch.

Memory switch setting	When power is turned on (reset signal is input), when self-print ends
Condition (1)	Maintain
Condition (2)	Top of form (black mark detection) to printing start position

B. Press FEED.

Executes top of form (black mark) to printing start position

C. Command

See the following command details.

D. Other Errors, Detailed Settings

Refer to each printer's specification manual.

2 Black Mark Error

- A. Enter black mark error
- When white is detected when feeding paper (*depends on the model) beyond a predetermined length.

Enter black mark error

• When black is detected when feeding paper (*depends on the model) beyond a predetermined length.

BM/PE dual use model → enter paper out error

BM independent model → enter black mark error

* Depends upon the model

See the Product Specifications Manual for each printer for details on the predetermined length and the BM sensor specifications (dual use and dedicated).

- B. Operation during a black mark error
- Offline
- Only the following commands are valid. Other commands are stored in the reception buffer.

ENQ: Inquire ENQ status
 EOT: Inquire EOT status
 ESC ACK SOH: Inquire automatic status

• Auto status is valid.

C. Black mark error canceling method

Refer to each printer's specification manual.

3. Ignore Commands

When black mark is valid, the following page length control commands are invalid.

Class	Commands	Function			
Page control	ESC C	3 bytes ignored (Set line page length to n lines)			
	ESC C 0	4 bytes ignored (Set line page length to n inches)			
	VT	1 byte ignored (Feed paper to vertical tab position)			
	ESC B Ignored until NUL (Set vertical tab position)				
	ESC N	3 bytes ignored (Set bottom margin to n lines)			
	2 bytes ignored (Cancel bottom margin)				



ESC d n

[Name] Paper cut instruction

[Code] ASCII ESC d n

Hexadecimal 1B 64 n Decimal 27 100 n

[Defined Area] $0 \le n \le 3$

 $48 \le n \le 51 \text{ ("0"} \le n \le "3")$

[Initial Value] ---

[Function] This command executes the auto-cut according to the n specification, after printing data in the line buffer.

After auto-cutter is executed, the printer considers that position to be the top of the page.

n	Auto-cutter
0, 48	Full cut at the current position.
	This command is ignored on tear-bar models.
1, 49	Partial cut at the current position.
	This command is ignored on tear-bar models.
2, 50	Paper is fed to cutting position, then a full cut.
	On tear-bar models, paper is fed to the cutting position.
3, 51	Paper is fed to cutting position, then a partial cut.
	On tear-bar models, paper is fed to the cutting position.

The auto-cutter function operates in the following ways on models that only have a full cut or a partial cut.

- Models that perform only a full cut: Executes a full cut when for instructions calling for a partial cut.
- Models that perform only a partial cut: Executes a partial cut when for instructions calling for a full cut.

The cutting position is the position (after detection of the black mark) set by the ESC GS (F (Set top of form amount in black mark control).

If not set by these commands, paper is fed to the initial position set by the memory switch.

- The cutting position (black mark) varies according to the paper used and to customer specifications.
- Refer to the printer product specifications you use for details regarding the distance to the cutting position (the physical value from the black mark to the print head to the cutter position).



FF

[Name] Performs TOF operation [Code] ASCII FF

Hexadecimal 0C Decimal 12

[Defined Area] ---[Initial Value] ---

[Function] This command performs the following operations after the printer prints the printing data in the line buffer.

Operations are set by the memory switch.

Memory SW	Cutter Model	Tear Bar Model
Condition (1)	Paper feed to printing start position	Paper feed to printing start position
Condition (2)	Feeds paper to the cutting position and performs a full cut. (*)	Paper feed to cutting position
Condition (3)	Paper feed to printing start position	Paper feed to printing start position
Condition (4)	Feeds paper to the cutting position and performs a partial cut. (*)	Paper feed to cutting position

(*) The auto-cutter function operates in the following ways on models that only have a full cut or a partial cut.

- Models that perform only a full cut: Executes a full cut when for instructions calling for a partial cut.
- Models that perform only a partial cut: Executes a partial cut when for instructions calling for a full cut.

The printing start position is the position (after detection of the black mark) set by the ESC FF (Set top of form amount after detecting black mark) and ESC GS (F (Set top of form amount in black mark control) commands.

The cutting position is the position (after detection of the black mark) set by the ESC GS (F (Set top of form amount in black mark control).

If not set by these commands, paper is fed to the initial position set by the memory switch.

- The print starting position (black mark) varies according to the paper used and to customer specifications.
- Refer to the printer product specifications you use for details regarding the distance to the print starting position (the physical value from the black mark to the print head to the cutter position).



ESC FF n1 n2

[Name] Set top of form amount after detecting black mark

[Code] ASCII ESC FF n1 n2

 Hexadecimal
 1B
 0C
 n1
 n2

 Decimal
 27
 12
 n1
 n2

[Defined Area] $0 \le n1 \times 256 + n2 \le 2047$ (however, less that the length between marks)

[Initial Value] Memory switch setting

[Function] This command sets the amount for top of form after black mark detection (n1 x 256 + n2) to steps.

(1 step = 1/144 of an inch)

The setting value of this command affects the printer initialization command (ESC @). If the parameter is outside of the defined range, this command is received and discarded.

The settings of top of form by this command are valid in executing the top of form operation using the FF (top of form operation) and pressing the Feed switch. To make the setting value valid, set this command before the execution command.

The paper position varies according to the printer type.

See each printer's product specifications manual for details on the memory switch settings.



ESC GS (F p1 p2 a m n1 n2

[Name] Set top of form amount in black mark control

[Code] **ESC** GS **p1** p2 n1 n2 1B 1D Hexadecimal 28 46 р1 p2 n1 n2 а m

Decimal 27 29 40 70 p1 p2 a m n1 n2

[Defined Area] p1 = 4, p2 = 0

a = 1, 2 m = 0, 48

 $0 \le n1 + n2 \times 256 \le 1700$ (however, less that the length between marks)

[Initial Value] Memory switch setting

[Function] Set top of form position (printing start position and cutting position) when using black mark control.

(p1 + p2 x 256) specifies the subsequent reception byte count.

a selects the target to set.

a = 1: Amount of movement of the printing start position (FF, Feed switch) corresponding to the black mark position.

a = 2: Amount of movement of the cutting position (ESC d) corresponding to the black mark position. m specifies the direction of position movement.m = specifies the direction of paper feed with 0, 48.

n1, n2 specify the actual amount of movement((n1 + n2 x 256) x 1/144 of an inch)

The setting value of this command affects the printer initialization command (ESC @).

If the parameter is outside of the defined range, this command is received and discarded.

The setting (a = 1) of movement to the printing starting position is valid in executing the top of form operation using the FF (top of form operation) and pressing the Feed switch. To make the setting value valid, set this command before the execution command.

The settings of the movement of the cutting position (a = 2) are valid when executing ESC d (paper cut). To make the setting value valid, set this command before the execution command.

The initial value of the set movement amounts abide the memory switch settings. The paper position varies according to the printer type.

See each printer's product specifications manual for details on the memory switch settings.



ESC RS m n

[Name] Enable, disable black mark detection [Code] ASCII ESC RS m

 Hexadecimal
 1B
 1E
 6D
 n

 Decimal
 27
 30
 109
 n

[Defined Area] n = 0, 1, 2, 48, 49, 50

[Initial Value] Memory SW

[Function] Switchest to enable/disable black mark (BM) detection control

When switching the setting, operations are the same as when switching to enable/disable using the memory switch. (However, that excludes the TOF operation that occurs when the power is turned ON.)

n	Black mark detection settings
0, 48	Invalid
1, 49	Valid
2, 50	Executes validate + TOP to the BM cutting position + paper full cut (SP542)
	This command executes a BM TOF + paper full cut only when the current setting is
	specified from invalid to valid using this command. (*)

n

(*) Precautions when specifying n = 2

Normally, when specified from a state where BM is valid to become invalid, the TOF to the BM cutting position + paper full cut is not executed. However, if this command (n = 2) is specified when the BM TOF has not been executed once, the same operation is executed after replacing paper.

For reference, see the functions and commands below that are affected when this setting is switched.

Affected Functions

Function	When BM is Valid (n = 1, 2, 49, 50)	When BM is Invalid (n = 0, 48)
Press FEED	Top of form to printing start position	Feed one line
BM Error	Supported	Invalid
Memory switch (for BM)	Supported	Invalid
EOT status (for BM)	Supported	Invalid
ASB status (for BM)	Supported	Invalid

Affected Commands

Class	Commands	When BM is Valid (n = 1, 2, 49, 50)	When BM is Invalid (n = 0, 48)		
BM Command	FF	Top of form to printing start position	Form feed		
	ESC d 2	TOF to cutting position + full cut	Paper fed to cutting position + full cut		
	ESC d 3	TOF to cutting position + partial cut	Paper fed to cutting position + partial cut		
Page control	ESC C	Ignored	Set page length to n lines		
	ESC C 0	Ignored	Set page length to n inches		
	VT	Ignored	Feed paper to vertical tab position		
	ESC B	Ignored	Set vertical tab position		
	ESC N	Ignored	Set bottom margin to n lines		
			Cancel bottom margin		

Note that at the point that this setting is switched, the current position is cleared to its default value in the same way as turning the power ON.

Also, the auto-status BM sensor detection is also initialized to white.

This command is normally used with black mark detection set to "valid" by the memory switch, and it is recommended to switch to "invalid" just once if necessary. Do not dynamically switch between valid and invalid for each receipt.



3-5 USB Related Commands

The following commands control USB interface functions.



3-6 2-Color Printing Command Details

ESC RS C n

[Name] Select/cancel 2-color printing mode [Code] ASCII ESC RS C n Hexadecimal 1B 1E 43 n

Decimal 27 30 67 n

[Defined Area] $0 \le n \le 1$

 $48 \le n \le 49 \text{ ("0"} \le n \le "1")$

[Initial Value] DIP switch

[Function]

n	Select/cancel 2-color printing mode
0, 48	Cancel 2-color printing mode
	When in two-color print mode, this command cancels 2-color printing mode.
	This command is ignored when the 2-color print mode is already cancelled.
	The specification of this command is not cleared by ESC @ CAN.
	The following processes are executed by canceling the 2-color print mode using this command.
	• Prints data in line buffer in 2-color print mode, if unprinted data exists in the line buffer.
	Waits to stop printing when printing in 2-color print mode.
1, 49	Select 2-color printing mode
	This command selects 2-color print mode, when in single color print mode.
	This command is ignored already in the 2-color print mode.
	The specification of this command is not cleared by ESC @ CAN.
	The following processes are executed by selecting the 2-color print mode using this command.
	• Prints data in line buffer in the single-color print mode, if unprinted data exists in the line buffer.
	Waits to stop printing when printing in single-color print mode.
	Initializes print color setting (2-color print mode setting)



FSC 4

[Name] Specify white/black inversion and red color printing

[Code] ASCII ESC 4

Hexadecimal 1B 34 Decimal 27 52

[Defined Area] --

[Initial Value] White/black inversion cancelled/black color printing specified

[Function] The following shows the details of this command. They vary according to the model.

Spec. 1

• Specifies white/black inverted printing (only on models that do not handle two color printing) Subsequent characters are printed, including the character pitch, with white and black inverted.

Printing is uni-directional. (SP2000, BD100) Precautions for Use of This Command

- (1) This command is enabled for ANK characters only. White/black is not inverted for Kanji characters and block graphic characters.
- (2) Do not use this command when ANK fonts are set to 5 x 9 (3P=1) (Print quality is not guaranteed.)
- (3) When the ANK font setting is 5 x 9 (2P=1), and character spacing is set to an odd number, the gap between characters will open, so set the character space to an even value.
- Specifies red color printing (only on models that handle two color printing)

Subsequent characters are printed in red.Red and black characters can be mixed on the same line.

This command is enabled for all print data (ANK characters, Kanji characters and bit images).

When switched to red colored, printing is uni-directional.

Spec. 2

This command function is based on the selection of red/black substitute function.

The red/black substitute function is selected by the memory switch or the command <ESC> <GS> "4" m n. For details on selecting the red/black substitute function using a command, see the explanation of <ESC> <GS> "4" m n below, and for details on selecting the red/black substitute function using the memory switch,

see the printer specifications manual.

ESC 5

[Name] Cancel white/black inversion/specify black color printing

[Code] ASCII ESC 5

Hexadecimal 1B 35 Decimal 27 53

[Defined Area] ---

[Initial Value] Cancel white/black inverted printing/specify black printing

[Function] The following shows the details of this command. They vary according to the model.

Spec. 1

Cancels white/black inverted printing (only on models that do not handle two color printing)

Cancels white/black inverted printing

Specifies black printing (only on models that handle two color printing)

Cancels red color printing and prints subsequent data in black.

Spec. 2

This command function is based on the selection of red/black substitute function.

The red/black substitute function is selected by the memory switch or the command <ESC> <GS> "4" m n.

For details on selecting the red/black substitute function using a command, see the explanation of <ESC> <GS> "4" m n below, and for details on selecting the red/black substitute function using the memory switch, see the printer specifications manual.



4. CHARACTER CODE TABLE

See the character code specifications



5. APPENDIX

5-1 Status Specifications

This function is effective only when using an interface capable of bi-directional data communications.

Refer to your printer's product specification manual to verify if the interface cable on the printer you use is capable of bi-directional data communications.

5-1-1 ENQ Command Status

This status is the one the printer transmits using the ENQ command.

Bit	Contents	Status		By model						
		"0"	"1"	BD100	SP2000	BD500	SP500	SP700		
7	Compulsion SW	Open	Closed	0	0	0	0	0		
6	Buffer overflow	No error	Overflow	0	0	0	0	0		
5	Reception Buffer	Has Data	Empty							
5	Empty		Empty	0	0	0	0	0		
4	Fixed at "0"		-	-	-	-	-	-		
3	Paper end	Paper	No paper	0	0	0	0	0		
2	Mechanical Error	No Error	Error	0	0	0	0	0		
1	Framing Error	No Error	Error	0	0	0	0	0		
0	Parity Error	No Error	Error	0	0	0	0	0		

Framing error/parity error

These errors occur when using a serial I/F. (For anything other than a serial interface, always Bit 0 = Bit 1 = 0.)

With these errors, the information at that time is held and the error status is sent when there is an inquiry of the status by this command.

Compulsion SW

When the conversion switch is ON, Bit 7 = 1.

5-1-2 EOT Command Status

This status is the one the printer transmits using the EOT command.

Bit	Contents	Status		By model							
DIL	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700			
7				-	-	-	-	-			
6				-	-	-	-	-			
5				-	-	-	-	-			
4	Fixed at "1"		-	-	-	-	-	-			
3	Paper end	Paper	No paper	0	0	0	0	0			
2	Paper near-end	Paper	No paper	х	0	Х	0	0			
1	Black mark detection	No Error	Error								
I	error	INO EITOI	EIIOI	X	Х	0	0	0			
0	Fixed at "0"		-	-	-	-	-	-			

Paper end Same as the ENQ status Bit 3

• Bit 5 to 7 states are unknown



5-1-3 Automatic Status

Auto status is a group of states that are automatically returned from the printer to the host when the printer's status has changed. Automatic status is composed of "Header 1," "Header 2" and "plurality of bytes of the printer status and is continuously returned to the host. The host always uses an identifying method to identify the data for every byte received. (It is possible that Xon/Xoff codes are exceptionally mixed in the auto status in the Xon/Xoff mode (when using a serial I/F), so it is necessary to consider that on the receiving side.) The valid/invalid conditions of the auto status abide by the DIPSW or the memory switch settings for the initial values.

It is possible to change the conditions using the ESC RS an command after turning ON the power.

Also, it is possible to get the auto status using the ESC ACK SOH command, regardless of the valid/invalid conditions.

1. Header 1

Header 1 is the 1 byte length information transmitted at the head of the automatic status.

The table below shows the composition of the Header 1.Header 1 represents the entire status transmission byte count, including Header 1, using bit 1 to bit 3 and bit 5. The host gets the transmission byte information and always receives the status data for that amount transmission bytes. For reference, the table below shows the relationship of actual transmission bytes and the Header 1. Because the bit 0 that indicates that this is the Header 1 is normally 1 (the second byte and beyond is 0), to detect the Header 1, it is acceptable to verify that bit 0 is 1 and bit 4 = 0 for this data. Note that bit 6 is for future expansion and is ignored in host-side processes.

<Header 1 (First Byte)>

Dit	Contento	Sta	tus	By model							
Bit	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700			
7	Fixed at "0"		-	-	-	-	-	-			
6	Reserved (Fixed at 0)		-	-	-	-	-	-			
5	Number of printer status bytes			0	0	0	0	0			
4	Fixed at "0"		-	-	-	-	-	-			
3	Number of printer status bytes			0	0	0	0	0			
2	Number of printer status bytes			0	0	0	0	0			
1	Number of printer status bytes			0	0	0	0	0			
0	Fixed at "1"	-		-	-	-	-	-			

Actual transmission byte count and header 1 table

Transmission Byte Count n $(7 \le n \le 15)$	Header 1
7	00001111B (0F Hex)
8	00100001B (21 Hex)
9	00100011B (23 Hex)
10	00100101B (25 Hex)
11	00100111B (27 Hex)
12	00101001B (29 Hex)
13	00101011B (2B Hex)
14	00101101B (2D Hex)
15	00101111B (2F Hex)



2. Header 2

Header 2 is the 1 byte length information transmitted from the second byte of the auto status. The table below shows the composition of the Header 2.

Header 2 represents the auto status version (called automatic status version below) using bit 1 to bit 3 and bit 5.

For reference, the table below shows the relationship of actual version bytes and the Header 2. The auto status version will be used as new information is added to the printer status bit positions that were empty, by adding new functions in the future.

When the host does not control the auto status version, it is acceptable to ignore Header 2 received.

<Header 2 (Second Byte)>

Bit	Contents	Sta	itus	By model							
DIL	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700			
7	ASB status expansion	No Expansion	Expansion	-	-	-	-	-			
6	Version Number		-	0	0	0	0	0			
5	Version Number			0	0	0	0	0			
4	Fixed at "0"		-	-	-	-	-	-			
3	Version Number			0	0	0	0	0			
2	Version Number			0	0	0	0	0			
1	Version Number			0	0	0	0	0			
0	Fixed at "0"	-		_	_	-	-	-			

Actual automatic status version and header 2 table

Version Number n	Header 2	Contents
1	00000010B (02 Hex)	Up to printer status 5 (7th byte) loaded
2	00000100B (04 Hex)	
3	00000110B (06 Hex)	Up to printer status 7 (9th byte) loaded
4	00001000B (08 Hex)	
5	00001010B (0A Hex)	
6	00001100B (0C Hex)	
7	00001110B (0E Hex)	
8	00100000B (20 Hex)	
9	00100010B (22 Hex)	
	-	
-	-	
-	-	
30	01101100B (6C Hex)	
31	01101110B (6E Hex)	



3. Printer Status

Printer status is the status of the printer sent from the 3rd byte of the automatic status.

For the printer status, (the number of bytes added in Header 1 minus two) is returned.

Printer status is always updated or new information. (No log exists.)

The following shows the composition of the status.

<Printer status 1 Printer status (Third Byte)>

Bit	Contents	Sta	tus	By model						
DIL	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700		
7	Fixed at "0"		-	-	-	-	-	-		
6	OFFLINE By Switch Input	No	Occurs	0	0	0	Х	0		
5	Cover Status	Closed	Open	Х	Х	Х	Х	0		
4	Fixed at "0"		-	-	-	-	-	-		
3	ON-LINE/OFF-LINE Status	ON-LINE	OFF-LINE	0	0	0	0	0		
2	Compulsion SW	Open	Closed	0	0	0	0	0		
1	<etb> Command</etb>	Not Executed	Executed	0	0	0	0	0		
0	Fixed at "0"		-	-	-	-	-	-		

^(*) Bit 1 cleared to zero (0) when received at the host (by clearing bit 1 to 0, auto status is not targeted to occur).

<Printer status 2 Error Information (Fourth Byte)>

Dit	Contento	Sta	tus	By model							
Bit	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700			
7	Fixed at "0"		-	-	-	-	-	-			
6	Stopped by high head temperature	Not stopped	Stopped	0	0	0	0	0			
5	Non-recoverable Error	No Error	Error	х	Х	0	0	0			
4	Fixed at "0"		-	-	-	-	-	-			
3	Auto-cutter Error	No Error	Error	0	0	0	0	0			
2	Mechanical Error	No Error	Error	0	0	0	0	0			
1	Not Used (Fixed at "0")			-	-	-	-	-			
0	Fixed at "0"		-	-	-	-	-	-			

<Printer status 3 Error Information (Fifth Byte)>

Bit	Contents	Sta	itus	By model							
DIL	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700			
7	Fixed at "0"		-	-	-	-	-	-			
6	Buffer overflow	No Error	Error	0	0	0	0	0			
5	Not Used (Fixed at "0")			-	-	-	-	-			
4	Fixed at "0"		-	-	-	-	-	-			
3	Black mark detection error	No Error	Error	х	Х	0	0	0			
2	Not Used (Fixed at "0")			-	-	-	-	-			
1	Not Used (Fixed at "0")			-	-	-	-	-			
0	Fixed at "0"		-	-	-	-	-	-			

(*) Bit 6 is cleared to 0 when sent to the host.



<Printer status 4 Sensor Information (Sixth Byte)>

Bit	Contents	Sta	tus	By model							
DIL	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700			
7	Fixed at "0"		-	-	-	-	-	-			
6	Not Used (Fixed at "0")		-	-	-	-	-	-			
_	Block Mark Detection Status	White	Black								
5	5 Black Mark Detection Status	detection	detection	_	_	0	0	0			
4	Fixed at "0"		-	-	-	-	-	-			
3	Paper end	Paper	No paper	0	0	0	0	0			
2	Paper near-end	Paper	No paper	х	0	х	0	0			
1	Not Used (Fixed at "0")			-	-	-	-	-			
0	Fixed at "0"		-	-	-	_	-	-			

<Printer status 5 Sensor Information (Seventh Byte)>

Dit	Contento	Stat	us	By model						
Bit	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700		
7	Fixed at "0"		-	-	-	-	-	-		
6	Not Used (Fixed at "0")			-	-	-	-	-		
5	Not Used (Fixed at "0")			-	-	-	-	-		
4	Fixed at "0"		-	-	-	-	-	-		
3	Not Used (Fixed at "0")			-	-	-	-	-		
2	Not Used (Fixed at "0")			-	-	-	-	-		
1	Not Used (Fixed at "0")			-	-	-	-	-		
0	Fixed at "0"		-	-	-	-	-	-		

<Printer status 6 ETB Information (Eighth Byte)>

Dit	Contents	Sta	tus	By model						
Bit	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700		
7	Fixed at "0"		-	-	-	-	-	-		
6	ETB Counter (Bit 4)			-	-	-	0	0		
5	ETB Counter (Bit 3)			-	-	-	0	0		
4	Fixed at "0"		-	-	-	-	-	-		
3	ETB Counter (Bit 2)			-	-	-	0	0		
2	ETB Counter (Bit 1)			-	-	-	0	0		
1	ETB Counter (Bit 0)			-	-	-	0	0		
0	Fixed at "0"		-	-	-	-	-	-		

<Printer status 7 Sensor Information (Ninth Byte)>

Dit	Contents	Sta	atus	By model						
Bit	Contents	"0"	"1"	BD100	SP2000	BD500	SP500	SP700		
7	Fixed at "0"		-	-	-	-	-	-		
6	Not Used (Fixed at "0")			-	-	-	-	-		
5	Not Used (Fixed at "0")			-	-	-	-	-		
4	Fixed at "0"		-	-	-	-	-	-		
3	Not Used (Fixed at "0")			-	-	-	-	-		
2	Not Used (Fixed at "0")			-	-	-	-	-		
1	Not Used (Fixed at "0")			-	-	-	-	-		
0	Fixed at "0"		-	-	-	-	_	-		



4. Cautions

Do not use ENQ, EOT, ESC, ACK and SOH when auto status is valid. Invalidate the automatic status in advance using the DIPSW (memory switch) or the ESC RS an command to query these.

5. How to Identify Statuses

Command/Functions	Status								
Command/Functions	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0	
XON	0	0	0	1	0	0	0	1	
XOFF	0	0	0	1	0	0	1	1	
ENQ	*	*	*	0	*	*	*	*	
EOT	*	*	*	1	*	*	*	0	
Auto Status (Header 1)	0	*	*	0	*	*	*	1	
Auto Status (Other than Header 1)	0	*	*	0	*	*	*	0	

0 = fixed at "0" bits/1 = fixed at "1" bits/* = variable bits.



5-1-4 Printer Status Transmission Specification when using Ethernet and Wireless LAN Interfaces

The following explains the printer status transmission specification when using Ethernet and wireless LAN interfaces.

- 1) Transmission Format:
- · When transmitting only STAR ASB:

• When transmitting printer status other than STAR ASB:

- <Length Details>
- 2 byte value indicating status data byte count (0x0000 ≤ Length ≤ 0x0200)
- When the status data is 10 bytes: Length = 0x000a
- When transmitting only STAR ASB: Add Length = 0x0000
- When STAR ASB Second byte Bit-7, and Length is added, Bit-7 = 1 is set.

For status analysis, the total byte count of ASB is detected using the first byte of STAR ASB, and whether length is added with the second byte Bit-7 of STAR ASB is detected. By getting the byte count of subsequent status data using the length, the status can be analyzed.

2) Status Data Transmission format

A. Status Type (2 byte or 4 byte)

First and second bytes

Indicate a factor of printer status occurring.

• "00": Reserved

• "01" to "09": Star real-time status request command

• "10" to "49": Star status request command

"50": Reserved
 "51" to "59": Reserved
 "60" to "99": Reserved
 "A0" to "FF": Reserved

Third and fourth bytes

If the factor is the command, indicates the n parameter of the command.

If there is no n parameter, the third and fourth bytes can be omitted.



B. Classification character 1 (1 Byte)

Sends ":" (3AH).

C. Data Type (1byte)

Indicates the data type of the printer status, and sends "B" (binary type, 42H).

D. Status length (2 bytes)

2 byte value indicating byte count of printer status

E. Printer status (variable)

Status sent by printer

The content of the status differs according to the cause.

Refer to Commands That are Factors, and Automatic Status for details on the content of the status.

F. Classification character 2 (1 byte)

Send ";" (3BH).

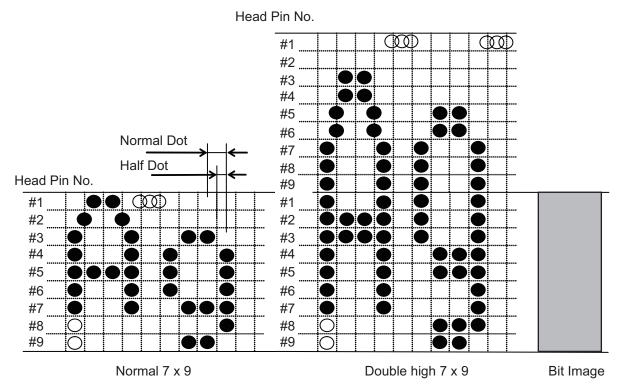
3) Status Transmission Specifications List

Status Factors	STAR	Length			Statu	ıs Data				
	ASB									
			Status	Туре	Break	Data	Status	Printer	Break	
			1st and	3rd and	Character	Type	Length	Status	Character	
			2nd Bytes	4th Bytes	1 (3AH)	(42H)			2 (3BH)	
			Factors	n						
				Parameter						
Automatic Status	ASB	0x0000								
ESC ACK SOH	ASB	0x0000								
Automatic Status										
Request										
ENQ	ASB	0x0008	"01"	Omitted	44 . 27	"B"	0x0001	Status	44 _ 37 7	
ENQ Status										
Request										
EOT	ASB	0x0008	"02"	Omitted	"."	"B"	0x0001	Status	44 _ 33 3	
EOT Status										
Request										

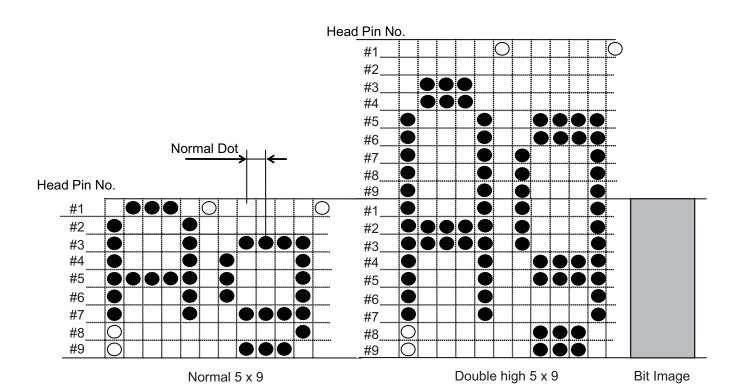


5-2 Expansion Position

5-2-1 7 x 9 Fonts

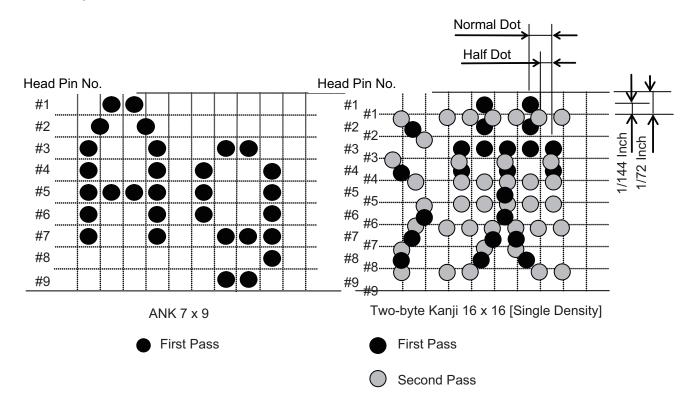


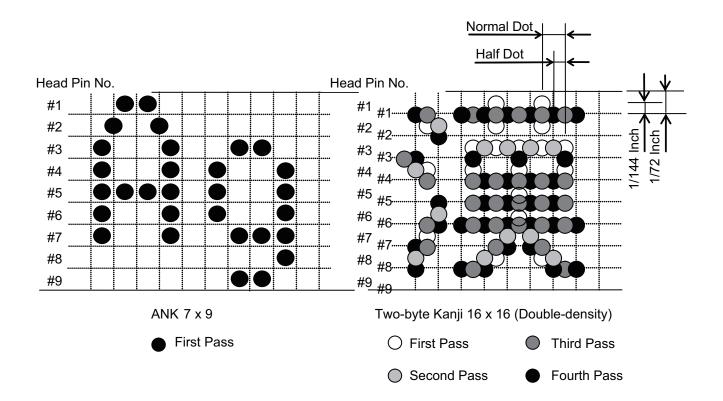
5-2-2 5 x 9 (2P-1) Fonts





5-2-2 Japanese Character Fonts







6. SPECIAL APPENDIX COMMAND LIST BY MODEL

Standard Commands

Standard Comm		Model Name									
Class	Commands	BD100	SP2000	BD500	SP500	SP700					
Font Style	ESC GS t	∘ Spec. 1	o Spec. 1	∘ Spec. 1	∘ Spec. 1	∘ Spec. 2					
and Character	ESC R	0	0	0	0	0					
Set	ESC /	0	0	0	0	0					
	ESC 6	0	0	0	0	0					
	ESC 7	0	0	0	0	0					
	ESC M	0	0	0	0	0					
	ESC P	0	0	0	0	0					
	ESC:	0	0	0	0	0					
	ESC SP	0	0	0	0	0					
Character	SO	0	0	0	0	0					
Expansion	DC4	0	0	0	0	0					
Settings	ESC W	0	0	0	0	0					
	ESC h	0	0	0	0	0					
Print Modes	ESC E	0	0	0	0	0					
	ESC F	0	0	0	0	0					
	ESC -	0	0	0	0	0					
	ESC _	0	0	0	0	0					
	ESC 4	0	0	0	∘(*2)	0					
	ESC 5	0	0	0	∘(*2)	0					
	ESC GS 4	-	-	-	0	0					
	SI	0	0	0	0	0					
	DC2	0	0	0	0	0					
	ESC RS i	0	0	0	0	0					
Line Spacing	LF	0	0	0	0	0					
	CR	0	0	0	0	0					
	ESC a	0	0	0	0	0					
	ESC 0	0	0	0	0	0					
	ESC 1	0	0	0	0	0					
	ESC z 0	0	0	0	0	0					
	ESC z 1	0	0	0	0	0					
	ESC A	0	0	0	0	0					
	ESC 2	0	0	0	0	0					
	ESC 3	0	0	0	0	0					
	ESC y	0	0	0	0	0					
	ESC J	0	0	0	0	0					
	ESC I	-	-	-	0	0					
Page Control	FF	0	0	0	0	0					
	ESC C	0	0	0	0	0					
	ESC C 0	0	0	0	0	0					
	VT	0	0	0	0	0					
	ESC B	0	0	0	0	0					
	ESC N	0	0	0	0	0					
	ESC O	0	0	0	0	0					



		Model Name							
Class	Commands	BD100	SP2000	BD500	SP500	SP700			
Horizontal	ESC RS A	-	-	-	o Spec. 1	o Spec. 2			
Direction	ESC I	0	0	0	0	0			
Position	ESC Q	0	0	0	0	0			
	HT	0	0	0	0	0			
	ESC D	0	0	0	0	0			
	ESC GS a	0	0	0	0	0			
	ESC GS A	-	-	-	0	0			
	ESC GS R	-	-	-	0	0			
Download	ESC &	0	0	0	0	0			
	ESC %	0	0	0	0	0			
Bit Image	ESC K	0	0	0	0	0			
Graphics	ESC L	0	0	0	0	0			
	ESC ^	0	0	0	0	0			
Logos	ESC FS q	-	-	-	-	0			
	ESC FS p	-	-	-	-	0			
Cutter Control	ESC d	0	0	0	0	0			
External	ESC BEL	0	0	0	0	0			
Device	BEL	0	0	0	0	0			
Drive	FS	0	0	0	0	0			
	SUB	Ignored	0	Ignored	0	0			
	EM	Ignored	0	Ignored	0	0			
	ESC GS EM DC1	-	-	-	-	0			
	ESC GS EM DC2	-	-	-	-	0			
Status	ENQ	0	0	0	0	0			
	EOT	0	0	0	0	0			
	ESC ACK SOH	0	0	0	0	0			
	ESC RS a (*9)	o Spec. 1	o Spec. 1	o Spec. 1	o Spec. 2	o Spec. 2			
	ETB	o Spec. 1	o Spec. 1	o Spec. 1	o Spec. 2	o Spec. 2			
	ESC RS E	-	-	-	0	0			
Kanji Characters (*1)	ESC p	Δ	Δ	Δ	Δ	Δ			
	ESC q	Δ	Δ	Δ	Δ	Δ			
	ESC \$	Δ	Δ	Δ	Δ	Δ			
	ESC s	o Spec. 1	o Spec. 1	o Spec. 1	o Spec. 2	o Spec. 2			
	ESC t	Δ	Δ	Δ	Δ	Δ			
	ESC r	o Spec. 1	o Spec. 1	o Spec. 1	o Spec. 2	o Spec. 3			
	ESC u 1	0	0	0	0	0			
	ESC u 0	0	0	0	0	0			
	ESC x 1	0	0	0	0	0			
	ESC x 0	0	0	0	0	0			
	ESC w 1	0	0	0	0	0			
	ESC w 0	0	0	0	0	0			



Class	Commando		Model Name								
Class	Commands	BD100	SP2000	BD500	SP500	SP700					
Others	RS	0	0	0	0	0					
	CAN	0	0	0	0	0					
	DC3	0	0	0	0	0					
	DC1	0	0	0	0	0					
	ESC @	0	0	0	0	0					
	ESC U	0	0	0	0	0					
	ESC GS#	-	-	0	0	0					
	ESC#	0	0	Ignored	Ignored	Ignored					
	ESC?	0	0	0	0	0					

· Black Mark Related Commands

Class	Commando	Model Name								
Class	Commands	BD100	SP2000	BD500	SP500	SP700				
Black mark	ESC d (Note 3)	-	-	0	0	0				
Related Commands	FF (Note 3)	-	-	0	0	0				
	ESC FF	-	_	0	0	0				
	ESC GS (F	-	-	0	0	0				
	ESC RS m	-	-	-	0	0				

USB Related Commands

Class	Commands			М	odel Nam	е	
Class	Commands	BD100	SP2000	BD500	SP500	SP700	
USB							
Related							
Commands							

2-Color Printing Related Commands

Class	Commanda	Model Name								
Class	Commands	BD100	SP2000	BD500	SP500	SP700				
	ESC RS C	-	-	-	-	0				
2-Color Printing	ESC 4	-	-	-	-	0				
Related Commands	ESC 5	-	-	-	-	0				

(Note 1) Kanji characters

- Δ: Enabled only on printer models equipped with Kanji characters.
- Japanese character control commands are ignored on models not installed with Japanese character fonts.
- Japanese character control commands are ignored if the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

(Note 2)

Red/black substitute function can be selected by the memory switch. Refer to each printer's specification manual.

Red/black substitute function can be selected by the command ESC GS 4.

(Note 3)

These are commands whose operation specifications vary when the black mark function is enabled.

(Note 9)

Ignored command when using Ethernet or wireless LAN.



ELECTRONIC PRODUCTS DIVISION STAR MICRONICS CO., LTD.

536 Nanatsushinya, Shimizu-ku, Shizuoka, 424-0066 Japan Tel: (int+81)-54-347-0112, Fax: (int+81)-54-347-0709

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OVERSEAS SUBSIDIARY COMPANIES STAR MICRONICS AMERICA, INC.

1150 King Georges Post Road, Edison, NJ 08837-3729 U.S.A. Tel: (int+1)-732-623-5555, Fax: (int+1)-732-623-5590

STAR MICRONICS U.K. LTD.

Star House, Peregrine Business Park, Gomm Road, High Wycombe, Bucks, HP13 7DL, U.K. Tel: (int+44)-1494-471111, Fax: (int+44)-1494-473333

STAR MICRONICS ASIA LTD.

Rm. 1901-5, 19/F., Enterprise Square Two, 3 Sheung Yuet Road, Kowloon Bay, Hong Kong Tel: (int+852)-2796-2727, Fax: (int+852)-2799-9344

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