Line Thermal/Dot Printer

STAR Line Mode
Command Specifications

Rev. 0.00

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Special Products Operating Division

Contents

1. GENERAL DESCRIPTION

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

- Hybrid printers
- Interfaces:
- Parallel
- RS-232C
- USB
- Ethernet

< Applicable Models:>

- HSP7000

2. COMMAND FUNCTION LIST

• Standard Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Font style and character set	ESC RS F	Select font	-
	ESC GS t	Select code page	←
	ESC GS =	Write blank code page data	←
	ESC R	Specify international character set	←
	ESC /	Specify/cancel slash zero	←
	ESC SP	Set ANK right space	←
	ESC M	Specify 12 dot pitch	Specify 7 x 9 font (half dots)
	ESC P	Specify 15 dot pitch	Specify 5 x 9 font (2P-1)
	ESC :	Specify 16 dot pitch	Specify 5 x 9 font (3P-1)
	ESC g	Specify 14 dot pitch	-
	ESC 6	-	-
	ESC 7	-	-
Character expansion settings	ESC i	Set/cancel the double wide/high	-
	ESC W	Specify/cancel expanded wide	←
	ESC h	Specify/cancel expanded high	←
	SO	Set double wide printing	←
	DC4	Cancel expanded wide	←
	ESC SO	Set double high	-
	ESC DC4	Cancel expanded high	-
Print modes	ESC E	Select emphasized printing	←
	ESC F	Cancel emphasized printing	←
	ESC -	Select/cancel underline mode	←
	ESC _	Select/cancel upperline mode	←
	ESC 4	Selects white/black inversion	Select white/black inversion red/ black colors (substitute function)
	ESC 5	Cancel white/black inversion	Cancel white/black inversion red/ black colors (substitute function)
	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 character rotated mode
Line spacing	LF	Line feed	←
	CR	Line feed	←
	ESC a	Feed paper n lines	←
	ESC z	Select line feed amount	←
	ESC 0	Specify line feed to 3 mm	Specify line feed amount of 1/8 inch
	ESC 1	Specify line feed to 3 mm	Specify line feed amount of 7/72 inch
	ESC J	n/4 mm line feed	n/72 inch paper feed
	ESC j	-	Reverse paper feed
	ESC l	n/8mm line feed	n/144 inch paper feed
	ESC A	Specify line feed amount of 3 mm/4mm	Define n/72 inch pitch line feed
	ESC 2	Specify line feed amount (Defined by ESC A n)	←
	ESC 3	-	Specify n/216 inch paper feed
	ESC y	-	Specify n/144 inch paper feed

Class	Commands	Name	
		Thermal	Slip, Validation
Page control	FF	Form feed	-
	ESC C	Set page length to n lines	-
	ESC C 0	Set page length in n x 24 mm units	-
	VT	Feed paper to vertical tab position	-
	ESC B	Set vertical tab position	-
Horizontal direction position	ESC I	Set left margin	←
	ESC Q	Set right margin	←
	HT	Move horizontal tab	←
	ESC D	Set/cancel horizontal tab	←
	ESC GS A	Move absolute position	←
	ESC GS R	Move relative position	←
	ESC GS a	Specify position alignment	←
Download	ESC &	Register/delete download characters	←
	ESC %	Set/cancel download characters	←
Bit image Graphics	ESC K	Standard density bit image	←
	ESC L	High density bit image	←
	ESC k	Fine bit image	-
	ESC X	Fine bit image	-
	ESC ^	-	9 Dot bit image
Logos	ESC FS q	Register logo	←
	ESC FS p	Print logo	←
	ESC RS L	Logo batch control	←
Bar Codes	ESC b	Print bar code	
Cutter control	ESC d	Auto-cutter	-
External device drive	ESC BEL	Set external drive device 1 pulse width	←
	BEL	External device 1 drive instruction	←
	FS	External device 1 drive instruction	←
	SUB	External device 2 drive instruction	←
	EM	External device 2 drive instruction	←
	ESC GS BEL	Ring buzzer	-
	ESC GS EM DC1	Set external buzzer drive pulse condition	←
	ESC GS EM DC2	Execute external buzzer drive	←
Print Setting	ESC RS d	Set print density	-
	ESC RS r	Set printing speed	-
Status	ESC RS a	Set status transmission conditions	←
	ESC ACK SOH	Real-time printer status (ASB Status)	←
	ENQ	Real-time printer status (1)	←
	EOT	Real-time printer status (2)	←
	ETB	Update of ETB status	←
	ESC RS E	Clear ETB counter, initialize ETB status	←

Class	Commands	Name	
		Thermal	Slip, Validation
Kanji Character	ESC p	Set JIS Kanji Character mode	←
	ESC q	Cancel JIS Kanji Character mode	←
	ESC $	Set/cancel JIS Kanji Character mode	←
	ESC s	Set two-byte Kanji characters left/ right spaces	←
	ESC t	Set single-byte Kanji characters left/right spaces	←
	ESC r	Register Chinese download characters	←
	ESC u	-	Specify two-byte 16 x 16 dot Kanji Character (Single density/double density)
	ESC x	-	Specify expanded Kanji characters (Double tall/double high & wide)
	ESC w	-	Specify expanded Kanji characters (batch double tall/double high & wide)
Others	RS	-	Ring buzzer
	CAN	Cancel print data and initialize commands	←
	ESC @	Initialize commands	←
	ESC U	-	Select printing direction
	ESC GS #	Set memory switch	←
	ESC # @	Initialize all memory switches	←
	ESC # N ?	Inquire memory switch setting contents	←
	ESC # *	Inquire printer version	←
	ESC ?	Reset printer	←
	DC3	Printer deselect	←
	DC1	Select printer	←

(*) Kanji character commands
• Kanji character control commands are ignored on printers not installed with Kanji character fonts (those intended for overseas).
• All Kanji control commands are ignored if the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

• Raster Related Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Raster commands	ESC * r R	Initialize raster mode	-
	ESC * r A	Enter raster mode	-
	ESC * r B	Quit raster mode	-
	ESC * r C	Clear raster data	-
	ESC * r D	Drawer drive	-
	ESC * r E	Set raster EOT mode	-
	ESC * r F	Set raster FF mode	-
	ESC * r P	Set raster page length	-
	ESC * r Q	Set raster print quality	-
	ESC * r m l	Set raster left margin	-
	ESC * r m r	Set raster right margin	-
	ESC * r T	Set raster top margin	-
	ESC * r K	Set raster print color	-
	b n1 n2 d1 … dk	Transfer raster data (auto line feed)	-
	k n1 n2 d1 … dk	Transfer raster data	-
	ESC * r Y	Move vertical direction position (Line feed for specified dots)	-
	ESC FF NUL	Execute form feed mode	-
	ESC FF EOT	Execute EOT mode	-
	ESC * r N	Discard specified byte count of data	-
	ESC * r V	Execute external buzzer drive	-

• Black Mark Related Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Black mark Related commands	ESC d	Auto-cutter:	-
	FF	Execute top of form	-
	ESC C	Set page length to n lines	-
	ESC C 0	Set page length in n x 24 mm units	-
	VT	Feed paper to vertical tab position	-
	ESC B	Set vertical tab position	-

• 2-Color Printing Related Commands

Class	Commands	Name	
		Thermal	Slip, Validation
2-Color Printing Related commands	ESC RS c	Specify printing color in 2 color printing mode	-
	ESC RS C	Select/cancel 2-color printing mode	-
	ESC 4	Specify white/black inversion or printing color red	Select white/black inversion red/ black colors (substitute function)
	ESC 5	Cancel white/black inversion or specify printing color black	Cancel white/black inversion red/ black colors (substitute function)
	ESC RS d	Set print density	-
	ESC RS r	Set printing speed	-
	ESC FS q	Register logo	←
	ESC FS p	Print logo	←

• Mark Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Mark Commands	ESC GS * 0	Print mark	-
	ESC GS * 1	Specify mark height and line feed	-
	ESC GS * 2	At each mark number Specify mark color, mark horizontal width	-
	ESC GS * W	Register mark format to non-volatile memory	-
	ESC GS * C	Initialize mark format from non-volatile memory	-

• Auto Logo Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Auto Logo Commands	ESC GS / W	Register Auto Logo setting to non-volatile memory	-
	ESC GS / C	Initialize Auto Logo setting from non-volatile memory	-
	ESC GS / 1	Set ON/OFF for Auto Logo function	-
	ESC GS / 2	Set command characters	-
	ESC GS / 3	Set user macro 1	-
	ESC GS / 4	Set user macro 2	-
	ESC GS / 5	Set command character switching method	-
	ESC GS / 6	Set partial cut just prior to Auto Logo printing	-

• PDF417 Commands

Class	Commands	Name	
		Thermal	Slip, Validation
PDF417 Commands	ESC GS x S 0	Set PDF417 bar code size	-
	ESC GS x S 1	Set PDF417 ECC (security level)	-
	ESC GS x S 2	Set PDF417 module x direction size	-
	ESC GS x S 3	Set PDF417 module aspect ratio	-
	ESC GS x D	Set PDF417 bar code data	-
	ESC GS x P	Print PDF417 bar code	-
	ESC GS x I	Get PDF417 bar code expansion information	←

• Print Start Trigger Control Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Print starting trigger	ESC GS g 0	Print starting trigger	-
	ESC GS g 1	Set print start timer	-

• QR Code Commands

Class	Commands	Name	
		Thermal	Slip, Validation
QR Code	ESC GS y S 0	Set QR code model	-
	ESC GS y S 1	Set QR code mistake correction level	-
	ESC GS y S 2	Set QR code cell size	-
	ESC GS y D 1	Set QR code data (auto setting)	-
	ESC GS y D 2	Set QR code data (manual setting)	-
	ESC GS y P	Print QR code	-
	ESC GS y I	Get QR code expansion information	←

• Page Function Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Page Function	ESC GS h 0	180˚ inversion function	-
	ESC GS h 1	Water mark function	-

• Slip/Validation Function Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Slip Function	ESC SI	-	-
	ESC FF	-	Slip/Validation Function
	ESC VT	-	-
	ESC EM	-	Set slip/validation automatic clamp
	ESC US		

• Page Mode Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Page mode	FF	-	Batch print page data
	ESC n	-	Select page mode
	ESC !	-	Select line mode
	ESC *	-	Set page mode print region
	ESC T	-	Sets page mode print direction

• Station Selection Command

Class	Commands	Name	
		Thermal	Slip, Validation
Station Selection	ESC + A	Station Selection	←

• Presenter Related Commands

Class	Commands	Name	
		Thermal	Slip, Validation
Presenter Related commands	ESC SYN 0	-	-
	ESC SYN 1	-	-
	ESC SYN 3	-	-
	ESC SYN 4	-	-

• MICR Related Command

Class	Commands	Name	
		Thermal	Slip, Validation
MICR	ESC FS M	MICR function	←

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 in line mode, 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. When the line buffer is full in the page mode, the printer move the print position to the head of the next line then starts with the new print data.

• 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.

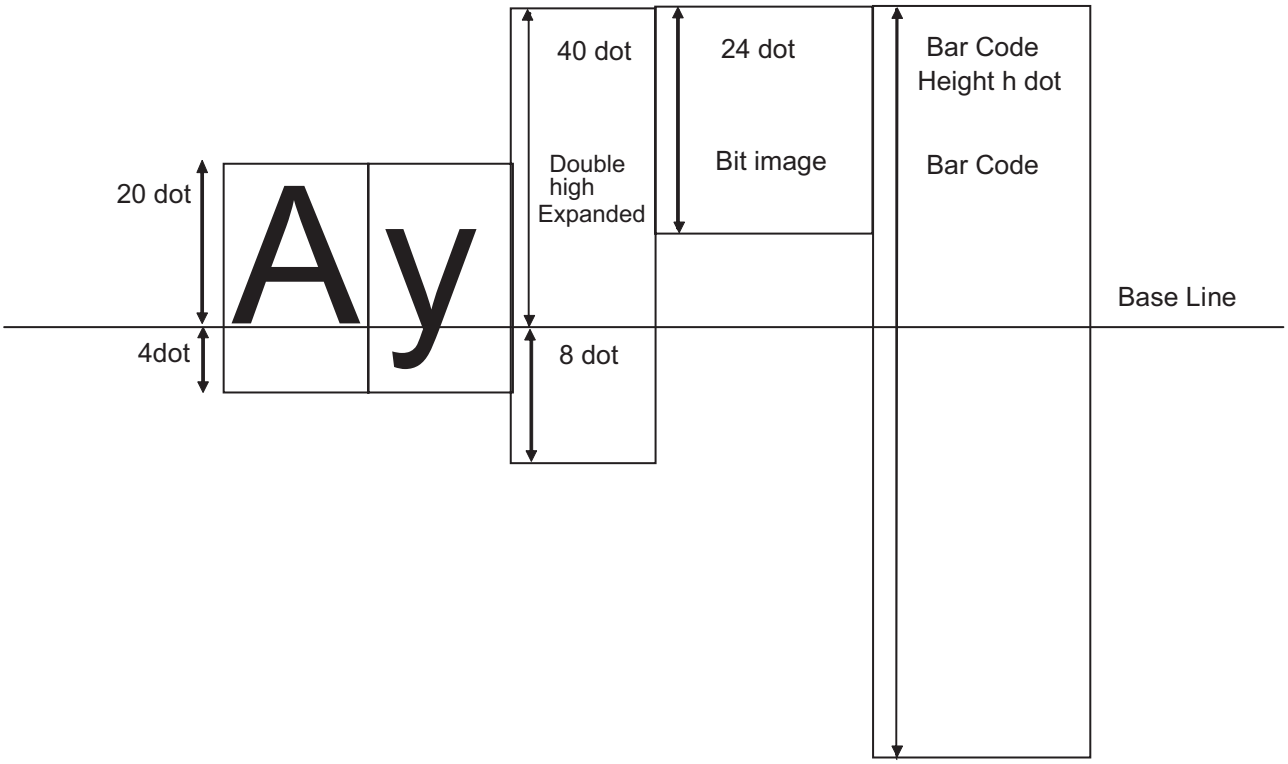
• Printable region

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)

• Print data expansion position



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, FS, GS, DLE are codes not defined as commands, ESC, FS,GS 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.

(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 RS F n

[Name] Select font

[Code]					
	ASCII	ESC	RS	F	n
	Hexadecimal	1B	1E	46	n
	Decimal	27	30	70	n

[Defined Area]	Thermal	:	0 ≦ n ≦ 1, n = 16
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Select font

n	Font
0	Font-A (12 x 24 dots)
1	Font-B (9 x 24 dots)
16	OCR-B (16 x 24 dots)

When OCR-B font is selected, the following functions are invalid.
- Code Pages
- Blank Code Pages
- International Characters
- Slashed Zero

When using the OCR-B font to read characters using a scanner, cancel adornment, expansion and external character settings. Also, check the OCR-B font by actual use.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

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]
Thermal : 0 ≦ n ≦ 21, 32 ≦ n ≦ 34, 64 ≦ n ≦ 79, n = 255
Slip : 0 ≦ n ≦ 21, 32 ≦ n ≦ 34, 64 ≦ n ≦ 79, n = 255
Validation : 0 ≦ n ≦ 21, 32 ≦ n ≦ 34, 64 ≦ n ≦ 79, n = 255

[Initial Value]
Thermal : Memory switch setting, when set to DBCS, Japanese characters normal katakana are fixed.
Slip : Memory switch setting, when set to DBCS, Japanese characters normal katakana are fixed.
Validation : Memory switch setting, when set to DBCS, Japanese characters normal katakana are fixed.

[Function] Specifies code page
When installed with Japanese language characters and DBCS setting, this command is ignored.

n	Code Page
0	Normal
1	CodePage437 (USA,Std. Europe)
2	Katakana
3	CodePage437 (USA, Std. Europe)
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	Code Page 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)
255	Empty page

(Note) The settings using this command are valid for all stations and modes.

ESC GS = n1 n2 da1 da2 … dak db1 db2 … dbk

[Name] Write blank code page data

[Code]														
ASCII	ESC	GS	=	n1	n2	da1	da2	..	dak	db1	db2	..	dbk
Hexadecimal	1B	1D	3D	n1	n2	da1	da2	..	dak	db1	db2	..	dbk
Decimal	27	29	61	n1	n2	da1	da2	..	dak	db1	db2	..	dbk

[Defined Area] Thermal : n1 = 0, n2 = 48, 1 ≦ (n1 + n2 x 256)

0 ≦ da ≦ 255 (Font-A data), db = 0 (Star mode does not have Font-B), k = (n1 + n2 x 256)

Slip : -

Validation : -

[Initial Value] Thermal : -

Slip : -

Validation : -

[Function] A blank code page indicates a character code table where character codes from 80h to FFh are all blank.

A blank code page can be selected using the ESC GS t n command n = 255.

The printer is reset when writing with this command is completed.

[Font-A Data Format Vertical 24 dots x Horizontal 12 dots]

• = Data region/ ○= Zero data

(Font - A Data Format Vertical 24 dot x Horizontal 12 dot)

	MSB							LSB		MSB				LSB			
Da1	●	●	●	●	●	●	●	●	Da2	●	●	●	●	○	○	○	○
Da3	●	●	●	●	●	●	●	●	Da4	●	●	●	●	○	○	○	○
Da5	●	●	●	●	●	●	●	●	Da6	●	●	●	●	○	○	○	○
Da7	●	●	●	●	●	●	●	●	Da8	●	●	●	●	○	○	○	○
Da9	●	●	●	●	●	●	●	●	Da10	●	●	●	●	○	○	○	○
Da11	●	●	●	●	●	●	●	●	Da12	●	●	●	●	○	○	○	○
Da13	●	●	●	●	●	●	●	●	Da14	●	●	●	●	○	○	○	○
Da15	●	●	●	●	●	●	●	●	Da16	●	●	●	●	○	○	○	○
Da17	●	●	●	●	●	●	●	●	Da18	●	●	●	●	○	○	○	○
Da19	●	●	●	●	●	●	●	●	Da20	●	●	●	●	○	○	○	○
Da21	●	●	●	●	●	●	●	●	Da22	●	●	●	●	○	○	○	○
Da23	●	●	●	●	●	●	●	●	Da24	●	●	●	●	○	○	○	○
Da25	●	●	●	●	●	●	●	●	Da26	●	●	●	●	○	○	○	○
Da27	●	●	●	●	●	●	●	●	Da28	●	●	●	●	○	○	○	○
Da29	●	●	●	●	●	●	●	●	Da30	●	●	●	●	○	○	○	○
Da31	●	●	●	●	●	●	●	●	Da32	●	●	●	●	○	○	○	○
Da33	●	●	●	●	●	●	●	●	Da34	●	●	●	●	○	○	○	○
Da35	●	●	●	●	●	●	●	●	Da36	●	●	●	●	○	○	○	○
Da37	●	●	●	●	●	●	●	●	Da38	●	●	●	●	○	○	○	○
Da39	●	●	●	●	●	●	●	●	Da40	●	●	●	●	○	○	○	○
Da41	●	●	●	●	●	●	●	●	Da42	●	●	●	●	○	○	○	○
Da43	●	●	●	●	●	●	●	●	Da44	●	●	●	●	○	○	○	○
Da45	●	●	●	●	●	●	●	●	Da46	●	●	●	●	○	○	○	○
Da47	●	●	●	●	●	●	●	●	Da48	●	●	●	●	○	○	○	○

● = Data Region / ○ = Zero Data

<Slip>, <Validation>

Only registration is possible.

Registration data is printable after switching to thermal.

ESC R n

[Name] Specify international character set

[Code]

ASCII	ESC	R	n
Hexadecimal	1B	52	n
Decimal	27	82	n

[Defined Area]
Thermal : 0 ≦ n ≦ 14, n = 64, 48 ≦ N ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 69 (”A” ≦ n ≦ “E”)
Slip : 0 ≦ n ≦ 14, n = 64, 48 ≦ N ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 69 (”A” ≦ n ≦ “E”)
Validation : 0 ≦ n ≦ 14, n = 64, 48 ≦ N ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 69 (”A” ≦ n ≦ “E”)

[Initial Value]
Thermal : Memory switch setting
When installed with Japanese language characters and DBCS setting: Fixed at n = 8
Slip : Memory switch setting
When installed with Japanese language characters and DBCS setting: Fixed at n = 8
Validation : Memory switch setting
When installed with Japanese language characters and DBCS setting: Fixed at n = 8

[Function] Specifies international characters
See each printer’s product specifications manual for details on the memory switch settings.

n	International Characters
0, 48	USA
1, 49	France
2, 50	Germany
3, 51	UK
4, 52	Denmark
5, 53	Sweden
6, 54	Italy
7, 55	Spain
8, 56	Japan
9, 57	Norway
10, 65	Denmark II
11, 66	Spain II
12, 67	Latin America
13, 68	Korea
14, 69	Ireland
64	Legal

When installed with Japanese language characters and DBCS setting, this command is ignored.

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.
At that time, the specified international character setting is valid when changed to a different code page.

(Note) The settings using this command are valid for all stations and modes.

ESC / N

[Name] Specify/cancel slash zero

[Code]

ASCII	ESC	/	n
Hexadecimal	1B	2F	n
Decimal	27	47	n

[Defined Area]
Thermal : n = 0, 1, 48, 49
Slip : n = 0, 1, 48, 49
Validation : n = 0, 1, 48, 49

[Initial Value]
Thermal : Memory switch setting
Slip : Memory switch setting
Validation : Memory switch setting

[Function] Specifies and cancels slash zeros.
See each printer's product specifications manual for details on the memory switch settings.

n	International Characters
0, 48	Cancels slash zero
1, 49	Specifies slash zero

Note that if the code page 3041 (Maltese) is selected for the code page, slash zero is invalid, and normal zeros will be printed.
At that time, the specified slash zero setting is valid when changed to a different code page.

(Note) The settings using this command are valid for all stations and modes.

ESC SP n

[Name] Set ANK right space

[Code]

ASCII	ESC	SP	n
Hexadecimal	1B	20	n
Decimal	27	32	n

[Defined Area]
Thermal : 0 ≦ n ≦ 15, 48 ≦ N ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 70 (”A” ≦ n ≦ “F”)
Slip : 0 ≦ n ≦ 15, 48 ≦ N ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 70 (”A” ≦ n ≦ “F”)
Validation : 0 ≦ n ≦ 15, 48 ≦ N ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 70 (”A” ≦ n ≦ “F”)

[Initial Value]
Thermal : Memory switch setting
Slip : n = 0
Validation : n = 0

[Function]
<Thermal>
Specifies the right space for ANK 12 x 24 dot fonts in n dots.
Character spacing can be specified also with the following commands.
- Specify 12 dot pitch (ESC M)
- Specify 14 dot pitch (ESC g)
- Specify 15 dot pitch (ESC P)
- Specify 16 dot pitch (ESC :)

<Slip>, <Validation>
Specifies right space of characters with n half dots.
When in horizontal double-wide printing, the right space is also double.

(Note) The settings by this command are valid for all stations.
Setting value is shared when thermal and slip, validation line mode is selected.
The setting value when slip, validation page mode is selected is shared only when slip, validation page mode is selected.

ESC M

[Name] (Thermal) Specify 12 dot pitch/(Slip) specify 7 x 9 font (half dots) (default)

[Code]	ASCII	ESC	M
	Hexadecimal	1B	4D
	Decimal	27	77

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Memory switch setting
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Specifies the right space for ANK 12 x 24 dot fonts in 0 dots.

<Slip>, <Validation>

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).
When page mode is selected, it is fixed at 5 x 9 fonts, and only the setting is valid.
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

ESC P

[Name] (Thermal) Specify 15 dot pitch/(Slip) specify 5 x 9 font (2P-1)

[Code]	ASCII	ESC	P
	Hexadecimal	1B	50
	Decimal	27	80

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Memory switch setting
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Specifies the right space for ANK 12 x 24 dot fonts in 3 dots.

<Slip>, <Validation>

Specifies 5 x 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).

(Note) The settings by this command are valid for all stations.

ESC :

[Name] (Thermal) Specify 16 dot pitch/(Slip) specify 5 x 9 font (3P-1)

[Code]			
	ASCII	ESC	:
	Hexadecimal	1B	3A
	Decimal	27	58

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Memory switch setting
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Specifies the right space for ANK 12 x 24 dot fonts in 4 dots.

<Slip>, <Validation>

Specifies 5 x 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).

(Note) The settings by this command are valid for all stations.

ESC g

[Name] Specify 14 dot pitch

[Code]			
	ASCII	ESC	g
	Hexadecimal	1B	67
	Decimal	27	103

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Memory switch setting
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Specifies rights space for the ANK 12 x 24 dot fonts to 2 dots.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC 6

[Name] Specify IBM character set #2

[Code]

ASCII	ESC	6
Hexadecimal	1B	36
Decimal	27	54

[Defined Area]

Thermal	:	-
Slip	:	-
Validation	:	-

[Initial Value]

Thermal	:	-
Slip	:	-
Validation	:	-

[Function] Two bytes ignored

ESC 7

[Name] Specify IBM character set #1

[Code]

ASCII	ESC	7
Hexadecimal	1B	37
Decimal	27	55

[Defined Area]

Thermal	:	-
Slip	:	-
Validation	:	-

[Initial Value]

Thermal	:	-
Slip	:	-
Validation	:	-

[Function] Two bytes ignored

3-3-2) Character Expansion Settings

ESC i n1 n2

[Name] Set/cancel the double wide/high

[Code]

ASCII	ESC	i	n1	n2
Hexadecimal	1B	69	n1	n2
Decimal	27	105	n1	n2

[Defined Area]
Thermal : 0 ≦ n1 ≦ 5, 48 ≦ n1 ≦ 53(“0” ≦ n1 ≦ “5”), 0 ≦ n2 ≦ 5, 48 ≦ n2 ≦ 53(“0” ≦ n2 ≦ “5”)
Slip : 0 ≦ n1 ≦ 5, 48 ≦ n1 ≦ 53(“0” ≦ n1 ≦ “5”), 0 ≦ n2 ≦ 5, 48 ≦ n2 ≦ 53(“0” ≦ n2 ≦ “5”)
Validation : 0 ≦ n1 ≦ 5, 48 ≦ n1 ≦ 53(“0” ≦ n1 ≦ “5”), 0 ≦ n2 ≦ 5, 48 ≦ n2 ≦ 53(“0” ≦ n2 ≦ “5”)

[Initial Value]
Thermal : n1 = 0 (Double high cancelled), n2 = 0 (Double wide cancelled)
Slip : n1 = 0 (Double high cancelled), n2 = 0 (Double wide cancelled)
Validation : n1 = 0 (Double high cancelled), n2 = 0 (Double wide cancelled)

[Function] Specifies/cancels double high/wide for ANK characters and Kanji characters.
This command is ignored if either n1 or n2 is outside of the defined area.

<Thermal>

n1	Expanded high
0, 48	Cancel expanded high
1, 49	Specifies 2x expansion
2, 50	Specifies 3x expansion
3, 51	Specifies 4x expansion
4, 52	Specifies 5x expansion
5, 53	Specifies 6x expansion

n2	Expanded wide
0, 48	Cancel expanded wide
1, 49	Specifies 2x wide expansion
2, 50	Specifies 3x wide expansion
3, 51	Specifies 4x wide expansion
4, 52	Specifies 5x wide expansion
5, 53	Specifies 6x wide expansion

<Slip>, <Validation>

n1	Expanded high
0, 48	Cancel expanded high
1 ≦ n1 ≦ 5, 49 ≦ n1 ≦ 53	Specifies 2x expansion

n2	Expanded wide
0, 48	Cancel expanded wide
1 ≦ n2 ≦ 5, 49 ≦ n2 ≦ 53	Specifies 2x wide expansion

However, in standard specifications, only the line feed amount is doubled for font configurations of 6 x 12 IBM block graphic characters.

When slip or validation is selected, and more than double is specified, printing is doubled for every setting.
Setting more than triple is valid after switching to thermal.

(Note) The settings using this command are valid for all stations and modes.

ESC W n

[Name] Specify/cancel expanded wide

[Code]

ASCII	ESC	W	n
Hexadecimal	1B	57	n
Decimal	27	87	n

[Defined Area]
Thermal : 0 ≦ n ≦ 5, 48 ≦ n ≦ 53, (“0” ≦ n ≦ “5”)
Slip : 0 ≦ n ≦ 5, 48 ≦ n ≦ 53, (“0” ≦ n ≦ “5”)
Validation : 0 ≦ n ≦ 5, 48 ≦ n ≦ 53, (“0” ≦ n ≦ “5”)

[Initial Value]
Thermal : n = 0 (Double wide cancelled)
Slip : n = 0 (Double wide cancelled)
Validation : n = 0 (Double wide cancelled)

[Function] Specifies/cancels double wide for ANK characters and Kanji characters.

<Thermal>

n	Expanded wide
0, 48	Cancel expanded wide
1, 49	Specifies 2x wide expansion
2, 50	Specifies 3x wide expansion
3, 51	Specifies 4x wide expansion
4, 52	Specifies 5x wide expansion
5, 53	Specifies 6x wide expansion

<Slip>, <Validation>

n	Function
0, 48	Cancels double wide expanded printing
1 ≦ n ≦ 5 49 ≦ n ≦ 53	Specifies double wide expanded printing

When slip or validation is selected, and more than double is specified, printing is doubled for every setting.
Setting more than triple is valid after switching to thermal.

(Note) The settings using this command are valid for all stations and modes.

ESC h n

[Name] Specify/cancel expanded high

[Code]

ASCII	ESC	h	n
Hexadecimal	1B	68	n
Decimal	27	104	n

[Defined Area]
Thermal : 0 ≦ n ≦ 5, 48 ≦ n ≦ 53, (“0” ≦ n ≦ “5”)
Slip : 0 ≦ n ≦ 5, 48 ≦ n ≦ 53, (“0” ≦ n ≦ “5”)
Validation : 0 ≦ n ≦ 5, 48 ≦ n ≦ 53, (“0” ≦ n ≦ “5”)

[Initial Value]
Thermal : n = 0 (Double high cancelled)
Slip : n = 0 (Double high cancelled)
Validation : n = 0 (Double high cancelled)

[Function] Specifies/cancels double high for ANK characters and Kanji characters.
When tall expanded characters and normal printing are mixed in the same line, they are aligned at the bottom.

<Thermal>

n	Expanded high
0, 48	Cancel expanded high
1, 49	Specifies 2x expansion
2, 50	Specifies 3x expansion
3, 51	Specifies 4x expansion
4, 52	Specifies 5x expansion
5, 53	Specifies 6x expansion

<Slip>, <Validation>

n	Function
0, 48	Cancels printing of vertical double-high character printing.
1 ≦ n ≦ 5 49 ≦ n ≦ 53	Specifies 2x expansion printing

However, in standard specifications, only the line feed amount is doubled for font configurations of 6 x 12 IBM block graphic characters, without expanding characters.

When slip or validation is selected, and more than double is specified, printing is doubled for every setting.
Setting more than triple is valid after switching to thermal.
When page mode is selected, the line feed amount including the expanded double-tall characters is 1x the normal amount.

(Note) The settings using this command are valid for all stations and modes.

SO

[Name] Set double wide

[Code]

ASCII	SO
Hexadecimal	0E
Decimal	14

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Cancels 2x wide expansion
	Slip	:	Cancels 2x wide expansion
	Validation	:	Cancels 2x wide expansion

[Function] Specifies double wide for ANK characters and Kanji characters.
This command is equivalent to ESC W 1.

(Note) The settings using this command are valid for all stations and modes.

DC4

[Name] Cancel expanded wide

[Code]

ASCII	DC4
Hexadecimal	14
Decimal	20

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Cancels 2x wide expansion
	Slip	:	Cancels 2x wide expansion
	Validation	:	Cancels 2x wide expansion

[Function] Cancels expanded wide if the following commands specify expanded wide.

- Double wide specifying command (SO)
- Set/cancel double wide (ESC W)
- Set/cancel double wide/high (ESC i)

This command is equivalent to ESC W 0.

(Note) The settings using this command are valid for all stations and modes.

ESC SO

[Name] Set double high

[Code]			
	ASCII	ESC	SO
	Hexadecimal	1B	0E
	Decimal	27	14

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Double high expansion cancelled.
	Slip	:	Double high expansion cancelled.
	Validation	:	Double high expansion cancelled.

[Function] Specifies double high for ANK characters and Kanji characters.
This command is equivalent to ESC h 1.

(Note) The settings using this command are valid for all stations and modes.

ESC DC4

[Name] Cancel expanded high

[Code]			
	ASCII	ESC	DC4
	Hexadecimal	1B	14
	Decimal	27	20

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Double high expansion cancelled.
	Slip	:	Double high expansion cancelled.
	Validation	:	Double high expansion cancelled.

[Function] Cancels expanded high if the following commands specify expanded high.
- Double high specifying command (ESC SO)
- Set/cancel the double high (ESC h)
- Set/cancel double wide/high (ESC i)

This command is equivalent to ESC h 0.

(Note) The settings using this command are valid for all stations and modes.

3-3-3) Print mode

ESC E

[Name] Select emphasized printing

[Code]

ASCII	ESC	E
Hexadecimal	1B	45
Decimal	27	69

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Emphasized printing cancelled.
	Slip	:	Emphasized printing cancelled.
	Validation	:	Emphasized printing cancelled.

[Function]

<Thermal> Specifies emphasized printing for ANK characters.
IBM block ignores emphasized printing.

<Slip>, <Validation>
Specifies emphasized printing for subsequent data.
When in emphasized printing, data is printed in two passes.
This command is valid for ANK and Kanji characters (Kanji).
(* 2-pass Japanese characters are printed with four passes; 4-pass Japanese characters are printed
with 8 passes.)
When page mode is selected, the emphasized printing specification is in page units.

(Note) The settings using this command are valid for all stations and modes.

ESC F

[Name] Cancel emphasized printing

[Code]

ASCII	ESC	F
Hexadecimal	1B	46
Decimal	27	70

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : Emphasized printing cancelled.
Slip : Emphasized printing cancelled.
Validation : Emphasized printing cancelled.

[Function]
<Thermal>
Cancels emphasized printing for ANK characters.

<Slip>, <Validation>
Cancels emphasized printing for subsequent data.
When page mode is selected, the emphasized printing cancel specification is in page units.

(Note) The settings using this command are valid for all stations and modes.

ESC – n

[Name] Specify/cancel underling mode

[Code]

ASCII	ESC	-	n
Hexadecimal	1B	2D	n
Decimal	27	45	n

[Defined Area]
Thermal : n = 0, 1, 48, 49
Slip : n = 0, 1, 48, 49
Validation : n = 0, 1, 48, 49

[Initial Value]
Thermal : n = 0 (Underline cancelled)
Slip : n = 0 (Underline cancelled)
Validation : n = 0 (Underline cancelled)

[Function] Specifies/cancels underline according to n value.

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

Underlines are not applied to horizontal tabs and to specified horizontal direction positions.
This command is valid for ANK characters and Japanese characters and is invalid for IBM blocks.
Underlines are valid for white/black inversion.

<Thermal>

Underlines are composed of 2 dot lines.
When character expansion is specified, underlines are also expanded (when in double-high expansion, underlines are composed of four dots.)

<Slip>, <Validation>

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

(Note) The settings using this command are valid for all stations and modes.

ESC _ n

[Name] Specify/cancel upperline

[Code]				
	ASCII	ESC	_	n
	Hexadecimal	1B	5F	n
	Decimal	27	95	n

[Defined Area]	Thermal	:	n = 0, 1, 48, 49
	Slip	:	n = 0, 1, 48, 49
	Validation	:	n = 0, 1, 48, 49
[Initial Value]	Thermal	:	n = 0 (Upperline cancelled)
	Slip	:	n = 0 (Upperline cancelled)
	Validation	:	n = 0 (Upperline cancelled)

[Function] Specifies/cancels upperline according to n value.

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

Upperlines are not applied to horizontal tabs and to specified horizontal direction positions.
This command is valid for ANK characters and Japanese characters and is invalid for IBM blocks.
Upperlines are valid for white/black inversion.

<Thermal>

Upperlines are composed of 2 dot lines.
When character expansion is specified, upperlines are also expanded (when in double-high expansion, upperlines are composed of four dots.)

<Slip>, <Validation>

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

(Note) The settings using this command are valid for all stations and modes.

ESC 4

[Name] (Thermal) Specify black/white inversion/(Slip) specify black/white inversion, red/black color (substitute function)

[Code]

ASCII	ESC	4
Hexadecimal	1B	34
Decimal	27	52

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : White/black inversion cancelled
Slip : White/black inversion cancelled/black color printing specified
Validation : White/black inversion cancelled/black color printing specified

[Function]
<Thermal>

Specifies white/black inversion for ANK characters and Kanji characters.
IBM block ignores white/black inversion.

<Slip>, <Validation>

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 below, and for details on selecting the red/black substitute function using the memory switch, see the printer specifications manual.

(Note) The settings using this command are valid for all stations and modes.

ESC 5

[Name] (Thermal) Cancel black/white inversion/(Slip) cancel black/white inversion, red/black color (substitute function)

[Code]

ASCII	ESC	5
Hexadecimal	1B	35
Decimal	27	53

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : White/black inversion cancelled
Slip : White/black inversion cancelled/black color printing specified
Validation : White/black inversion cancelled/black color printing specified

[Function]
<Thermal>

Cancels white/black inversion for ANK characters and Kanji characters.

<Slip>, <Validation>

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 below, and for details on selecting the red/black substitute function using the memory switch, see the printer specifications manual.

(Note) The settings using this command are valid for all stations and modes.

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]

Thermal : -

Slip : m = 1, 2, 49, 50

When m = 1, 49 (“1”) :n = 0 to 3, 255

When m = 2, 50 (“2”) :n = 0, 2 to 5

When m = 83 (“S”) :n = 0, 1

Validation : m = 1, 2, 49, 50

When m = 1, 49 (“1”) :n = 0 to 3, 255

When m = 2, 50 (“2”) :n = 0, 2 to 5

When m = 83 (“S”) :n = 0, 1

[Initial Value]

Thermal : -

Slip : Memory switch setting

Validation : Memory switch setting

[Function]

<Thermal>

Only setting is valid

Setting is valid after switching to slip or validation.

<Slip>, <Validation>

Selects red/black substitute function

Selects characters targeted for adornment with m = 1 (ANK) or m = 2 (Japanese 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.

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 Targeted characters = ANK

m	n	ESC 4/ESC 5 command functions (ANK)
1, 49	0	White/black inverted printing (1 Pass)
1, 49	1	<Option 1> White/black inversion (5 x 9 font print) + enhancing (2 passes)
1, 49	2	<Option 2> Upper line + Underline + enhancing (2 passes)
1, 49	3	<Option 3> Upper line + Underline + double tall expanded + enhancing (4 passes)
1, 49	255	No adornment

• When m = 2, 50 Targeted characters = Japanese Characters

m	n	ESC 4/ESC 5 command functions (Japanese characters)
2, 50	0	No adornment
2, 50	2	<Option 2> Upper line + Underline + enhancing (4 passes)
2, 50	3	<Option 3> Upper line + Underline + double tall expanded + enhancing (4 passes)
2, 50	4	<Option 4> White/Black Inverted + Double-Tall (2 passes)
2, 50	5	<Option 5> White/Black Inverted + 4 X Expanded (2 passes)

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 x 9 fonts are printed regardless of the current font setting (7 x 9/5 x 9).
5. Must not set “ANK default dot count = Narrow” with the memory switch. (This will cause a white line to appear between characters.)

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

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

• When m = 83 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)
Print Data: <ESC> “4” “TOTAL” 20H 20H 20H 20H 20H 20H 20H 20H 20H “$1234” <LF>

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

TOTAL $1234

<Condition 2> ANK adornment = “black/white inverted printing,” ANK space characters = “no red/black adornment”

TOTAL $1234

SI

[Name] Select upside-down printing

[Code]

ASCII	SI
Hexadecimal	0F
Decimal	15

[Defined Area]

Thermal	:	-
Slip	:	-
Validation	:	-

[Initial Value]

Thermal	:	Upside-down printing cancelled
Slip	:	Upside-down printing cancelled
Validation	:	Upside-down printing cancelled

[Function]

Specifies upside-down printing
This command is enabled only when at the top of the line.
Upside down and right-side up characters cannot both exist in the same line.

This command is enabled for following.
- ANK characters
- Kanji characters
- Bit images
- Logos
- Bar codes

<Slip>, <Validation>

When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

DC2

[Name] Cancel upside-down printing

[Code]

ASCII	DC2
Hexadecimal	12
Decimal	18

[Defined Area]

Thermal	:	-
Slip	:	-
Validation	:	-

[Initial Value]

Thermal	:	Upside-down printing cancelled
Slip	:	Upside-down printing cancelled
Validation	:	Upside-down printing cancelled

[Function]

Cancels upside-down printing
This command is enabled only when at the top of the line.

(Note) The settings by this command are valid for all stations.

ESC RS i n

[Name] Specify/cancel character rotated mode

[Code]

ASCII	ESC	RS	i	n
Hexadecimal	1B	1E	69	n
Decimal	27	30	105	n

[Defined Area]
Thermal : -
Slip : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)
Validation : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)

[Initial Value]
Thermal : -
Slip : Character rotation cancelled (n = 0)
Validation : Character rotation cancelled (n = 0)

[Function]

<Thermal>

Only setting is valid
Setting is valid after switching to slip or validation.

<Slip>, <Validation>

Specifies direction to rotate print (clockwise) or to cancel rotation for subsequent data, according to the n value.

n	Set rotation
0, 48	Cancelled (0° rotation)
1, 49	270° rotation
2, 50	90° 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 Kanji character mode, rotation is effective for both ANK characters and Japanese characters.
Kanji character spacing is always applied with the two-byte Kanji character spacing value.
In standard specifications, rotation of IBM block 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.)
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

3-3-4) Line Spacing

LF

[Name] Line feed
[Code] ASCII LF
Hexadecimal 0A
Decimal 10

[Defined Area] Thermal : -
Slip : -
Validation : -
[Initial Value] Thermal : Memory switch setting
Slip : 1/6 inch line feed
Validation : 1/6 inch line feed

[Function] Feeds the currently specified amount of paper.
If print data exists in the line buffer, it prints that data.

<Thermal>

Initial value of line feed amount is set by the memory switch.

CR

[Name] Carriage return (Print line feed)
[Code] ASCII CR
Hexadecimal 0D
Decimal 13

[Defined Area] Thermal : -
Slip : -
Validation : -
[Initial Value] Thermal : Memory switch setting
Slip : Memory switch setting
Validation : Memory switch setting

[Function] Specifies the function according to the memory switch value.
See each printer's product specifications manual for details on the memory switch settings.

<Thermal>

Memory SW	Function
Condition (1)	Ignored
Condition (2)	Same as the LF code.

<Slip>, <Validation>

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

ESC a n

[Name] Feed paper n lines

[Code]

ASCII	ESC	a	n
Hexadecimal	1B	61	n
Decimal	27	97	n

[Defined Area]
Thermal : 1 ≦ n ≦ 127
Slip : 1 ≦ n ≦ 127
Validation : 1 ≦ n ≦ 127

[Initial Value]
Thermal : Memory switch setting
Slip : 1/6 inch
Validation : 1/6 inch

[Function] Executes paper feed of (currently specified line feed amount x n).
If print data exists in the line buffer, it prints that data.
This paper feed amount is unaffected even if there are vertical expanded characters in one line.

ESC z n

[Name] Select line feed amount

[Code]

ASCII	ESC	z	n
Hexadecimal	1B	7A	n
Decimal	27	122	n

[Defined Area]
Thermal : n = 1, 49
Slip : n = 0, 1, n = 48, 49
Validation : n = 0, 1, n = 48, 49

[Initial Value]
Thermal : Memory switch setting
Slip : 1/6 inch
Validation : 1/6 inch

[Function]

<Thermal> Specifies the line feed amount.

n	Amount of Line Feed
1, 49	Specifies 4 mm line feed amount

<Slip>, <Validation>

Specifies the line feed amount.

n	Amount of Line Feed
0, 48	Specifies 1/12 inch line feed amount
1, 49	Specifies 1/6 inch line feed amount

Line feed amounts can be set independently for both line mode and page mode.

ESC 0

[Name] (Thermal) Specify 3 mm line feed amount/(Slip) specify 1/8 line feed amount

[Code]

ASCII	ESC	0
Hexadecimal	1B	30
Decimal	27	48

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : Memory switch setting
Slip : 1/6 inch
Validation : 1/6 inch

[Function]

<Thermal> Specifies the line feed amount to 3 mm.

<Slip>, <Validation>

Specifies the line feed amount to 1/8 inch.
Line feed amounts can be set independently for both line mode and page mode.

ESC 1

[Name] (Thermal) Specify 3 mm line feed amount/(Slip) specify 7/72 inch line feed amount

[Code]			
	ASCII	ESC	1
	Hexadecimal	1B	31
	Decimal	27	49

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	Memory switch setting
	Slip	:	1/6 inch
	Validation	:	1/6 inch

[Function]
<Thermal>
Specifies the line feed amount to 3 mm.

<Slip>, <Validation>
Specifies the line feed amount to 7/72 in.
Line feed amounts can be set independently for both line mode and page mode.

ESC J n

[Name] (Thermal) n/4 mm line feed/(Slip) execute n/72 line feed one time

[Code]				
	ASCII	ESC	J	n
	Hexadecimal	1B	4A	n
	Decimal	27	74	n

[Defined Area]	Thermal	:	1 ≦ n ≦ 255
	Slip	:	1 ≦ n ≦ 255
	Validation	:	1 ≦ n ≦ 255
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Execute paper feed.
If print data exists in the line buffer, it prints that data.
This paper feed amount is unaffected even if there are vertical expanded characters in one line.
The single line feed amount setting value is not changed by this command.

<Thermal> Executes a n/4mm paper feed.
Using this command will intermittently feed paper, therefore, it is normally recommended that this command not be used.
(Currently set line feed amount –n/4 mm) portion is not printed.

<Slip>, <Validation>
Executes a n/72 in paper feed.

ESC j n

[Name] Reverse paper feed

[Code]

ASCII	ESC	j	n
Hexadecimal	1B	6A	n
Decimal	27	106	n

[Defined Area]
Thermal : -
Slip : 0 ≦ n ≦ 255
Validation : 0 ≦ n ≦ 255

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Three bytes ignored

<Slip>, <Validation>

Executes a n/72 in reverse direction paper feed.
If print data exists in the line buffer, it prints that data.
This paper feed amount is unaffected even if there are vertical expanded characters in one line.
The single line feed amount setting value is not changed by this command.

ESC l n

[Name] Executes (thermal) n/8 mm line feed/(slip) n/144 line feed one time.

[Code]

ASCII	ESC	l	n
Hexadecimal	1B	49	n
Decimal	27	73	n

[Defined Area]
Thermal : 1 ≦ n ≦ 255
Slip : 1 ≦ n ≦ 255
Validation : 1 ≦ n ≦ 255

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function] Executes paper feed.
If print data exists in the line buffer, it prints that data.
This paper feed amount is unaffected even if there are vertical expanded characters in one line.
The single line feed amount setting value is not changed by this command.

<Thermal>

Executes a n/8 mm paper feed.
Using this command will intermittently feed paper, therefore, it is normally recommended that this command not be used.
(Currently set line feed amount –n/8mm) portion is not printed.

<Slip>, <Validation>

Executes a n/144 in paper feed.

ESC A n

[Name] Defines (thermal) a 3 mm/4 mm line feed amount/Defines (slip) n/72 inch pitch line feed

[Code]

ASCII	ESC	A	n
Hexadecimal	1B	41	n
Decimal	27	65	n

[Defined Area]

Thermal	:	0 ≦ n ≦ 255
Slip	:	0 ≦ n ≦ 85
Validation	:	0 ≦ n ≦ 85

[Initial Value]

Thermal	:	-
Slip	:	-
Validation	:	-

[Function] Defines the line feed amount.
The line feed amount defined using this command is specified to the current line feed amount by the ESC 2 command.

<Thermal>

n	Amount of Line Feed
0 ≦ n ≦ 9	Defines a 3 mm line feed amount
10 ≦ n	Defines a 4 mm line feed amount

<Slip>, <Validation>
Defines line feed amount for one line as n/72 inch.
Line feed amounts can be set independently for both line mode and page mode.

ESC 2

[Name] Specify line feed amount (ESC A n)

[Code]

ASCII	ESC	2	
Hexadecimal	1B	32	
Decimal	27	50	

[Defined Area]

Thermal	:	-
Slip	:	-
Validation	:	-

[Initial Value]

Thermal	:	Memory switch setting
Slip	:	1/6 inch line feed
Validation	:	1/6 inch line feed

[Function] Specifies the line feed amount to the value defined by ESC A n.

ESC 3 n

[Name] Specify n/216 inch paper feed

[Code]				
	ASCII	ESC	3	n
	Hexadecimal	1B	33	n
	Decimal	27	51	n

[Defined Area]	Thermal	:	-
	Slip	:	0 ≦ n ≦ 255
	Validation	:	0 ≦ n ≦ 255
[Initial Value]	Thermal	:	-
	Slip	:	1/6 inch line feed
	Validation	:	1/6 inch line feed

[Function]

<Thermal>

Three bytes ignored

<Slip>, <Validation>

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

Line feed amounts can be set independently for both line mode and page mode.

ESC y n

[Name] Specify n/144 inch paper feed

[Code]				
	ASCII	ESC	y	n
	Hexadecimal	1B	79	n
	Decimal	27	121	n

[Defined Area]	Thermal	:	-
	Slip	:	0 ≦ n ≦ 255
	Validation	:	0 ≦ n ≦ 255
[Initial Value]	Thermal	:	-
	Slip	:	1/6 inch line feed
	Validation	:	1/6 inch line feed

[Function]

<Thermal>

Three bytes ignored

<Slip>, <Validation>

Sets subsequent line feed amounts to a n/144 inch.
Line feed amounts can be set independently for both line mode and page mode.

3-3-5) Page Control Commands

FF

[Name] Form feed

[Code]

ASCII		FF
Hexadecimal		0C
Decimal		12

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Executes a form feed.
If the current position is at the top of the page, it form feeds to the top of the next page.
If there is data existing in the line buffer when executing a form feed, it prints that data, then executes the form feed.
However, by printing data remaining in the buffer, and moving to the top of the next page, a form feed is considered to have been executed, so form feed is not performed.

<Slip>, <Validation>

Refer to the “Page Mode Command Details.”

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]
Thermal : 1 ≦ n ≦ 127
Slip : -
Validation : -

[Initial Value]
Thermal : (Form feed amount initial value x 42)
Slip : -
Validation : -

[Function]

<Thermal>

The position whereat this command is processed is considered the top of the page and sets the page length to (current form feed amount x n).
This command cancels the bottom margin setting when setting page length.
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 following commands.
• Form feed command (FF): Execute form feed
• Cutter command (ESC d n): Sets cutter position at top of page.
• Raster command (ESC * r B): Top of page when raster mode ends.
• Error cancel operations: Sets error cancel operation end position at the top of the page.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC C 0 n

[Name] Set n x 24 mm page length

[Code]

ASCII	ESC	C	0	n
Hexadecimal	1B	43	00	n
Decimal	27	67	0	n

[Defined Area]
Thermal : 1 ≦ n ≦ 22
Slip : -
Validation : -

[Initial Value]
Thermal : (Form feed amount initial value x 42)
Slip : -
Validation : -

[Function]

<Thermal>

The position whereat this command is processed is considered the top of the page and sets the page length to (n x 24 mm).
This command cancels the bottom margin setting when setting page length.
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 following commands.

- Form feed command (FF): Execute form feed
- Cutter command (ESC d n): Sets cutter position at top of page.
- Raster command (ESC * r B): Top of page when raster mode ends.
- Error cancel operations: Sets error cancel operation end position at the top of the page.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

VT

[Name] Feed paper to vertical tab position

[Code]

ASCII	VT
Hexadecimal	0B
Decimal	11

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Feeds paper to the next vertical tab position.
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.
If data exists in the line buffer when feeing paper to the vertical tab position, it executes the paper feed to the vertical tab position after printing that data.
However, if moved to the vertical tab position by printing data remaining in the buffer, the move to the vertical tab position is considered to have been executed, so a move to the next vertical tab position is not performed.
There is no initial value for the vertical tab.

<Slip>, <Validation>

One byte ignored

ESC B n1 n2 … nk NUL

[Name] Set vertical tab position

[Code]	ASCII	ESC	B	n1	n2	..	nk	NUL
	Hexadecimal	1B	42	n1	n2	..	nk	00
	Decimal	27	66	n1	n2	..	nk	0

[Defined Area]	Thermal	:	1 ≦ n ≦ 255, 0 ≦ n ≦ 16
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Sets the vertical tab to the (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 ≦ n1 ≦ n2 ... ≦ nk.
When receiving such an illegal code, 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.
Vertical tabs set using the ESC B NUL command are cleared.
There is no initial value for the vertical tab.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC B NUL

[Name] Clear vertical tab position

[Code]	ASCII	ESC	B	NUL
	Hexadecimal	1B	42	00
	Decimal	27	66	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Clears the currently set vertical tab.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

3-3-6) Horizontal Direction Printing Position

ESC l n

[Name] Set left margin

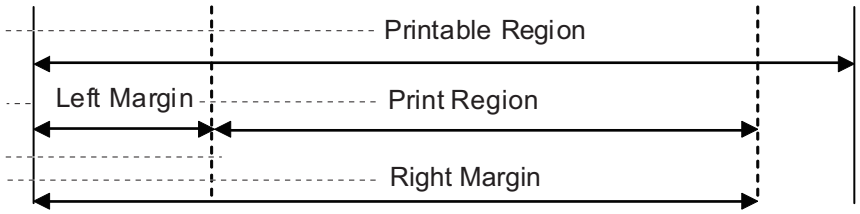
[Code]				
	ASCII	ESC	l	n
	Hexadecimal	1B	6C	n
	Decimal	27	108	n

[Defined Area]	Thermal	:	0 ≦ n ≦ 255
	Slip	:	0 ≦ n ≦ (right margin -2) ≦ 255
	Validation	:	0 ≦ n ≦ (right margin -2) ≦ 255
[Initial Value]	Thermal	:	n = 0
	Slip	:	n = 0
	Validation	:	n = 0

[Function] Uses the left edge as a standard to set the left margin (current ANK character pitch x n).
Setting this command partway will 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.

<Thermal>
The right edge is also the reference for upside-down printing.
This command is ignored if settings are for a printing region less than 36 mm.

<Slip>, <Validation>
The left edge is also the reference for upside-down printing.
The left margin must be at least a minimum of 18 dots therebetween with the right margin. (*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)
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.



ESC Q n

[Name] Set right margin

[Code]

ASCII	ESC	Q	n
Hexadecimal	1B	51	n
Decimal	27	81	n

[Defined Area]
- Thermal : 0 ≦ n ≦ 255
- Slip : 2 ≦ n ≦ maximum printable digits ≦ 255
- Validation : 2 ≦ n ≦ maximum printable digits ≦ 255

[Initial Value]
- Thermal : -
- Slip : Maximum printable digits
- Validation : Maximum printable digits

[Function] Uses the left edge as a standard to set the print region as (current ANK character pitch x n).
Setting this command partway will 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.

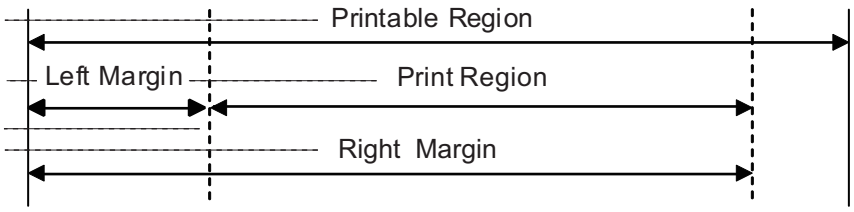
<Thermal>

The right edge is also the reference for upside-down printing.
This command is ignored if settings are for a printing region less than 36 mm.

<Slip>, <Validation>

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

When page mode is selected, only setting is valid
Setting is valid after switching to line mode.



HT

[Name] Move horizontal tab

[Code]

ASCII		HT
Hexadecimal		09
Decimal		9

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[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.
There is no initial value for the horizontal tab.
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]	Thermal	:	1 ≦ n ≦ 255, 0 ≦ n ≦ 32
	Slip	:	1 ≦ n ≦ 255, 0 ≦ n ≦ 32
	Validation	:	1 ≦ n ≦ 255, 0 ≦ n ≦ 32
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[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 right edge of the paper, regardless of the left margin.
ANK character pitches, including right spaces, are unaffected by expansion settings.
The right edge is also the reference for upside-down printing.
All other horizontal tabs set before setting the horizontal tab using this command are cancelled
A maximum of 32 horizontal tabs can be set.
However, 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
The horizontal tab set using this command is unaffected by changing the character pitch.
Horizontal tabs set using the ESC D NUL command are cleared.
There is no initial value for the horizontal tab.

(Note) The settings using this command are valid for all stations and modes.

ESC D NUL

[Name] Clear horizontal tab

[Code]				
ASCII	ESC	D	NUL
Hexadecimal	1B	44	00
Decimal	27	68	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Clears the currently set horizontal tab.

(Note) The settings using this command are valid for all stations and modes.

ESC GS A n1 n2

[Name] Move absolute position

[Code]						
ASCII	ESC	GS	A	n1	n2
Hexadecimal	1B	1D	41	n1	n2
Decimal	27	29	65	n1	n2

[Defined Area]	Thermal	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
	Slip	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
	Validation	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Moves the printing position from the left margin to the (n1 + n2 x 256) dot position.
This command is ignored if the print region is exceeded.
The right margin is also the reference for upside-down printing.

<Thermal>
The left margin is also the reference for upside-down printing.

<Slip>, <Validation>
The right margin is also the reference for upside-down printing.

ESC GS R n1 n2

[Name] Move relative position

[Code]						
	ASCII	ESC	GS	R	n1	n2
	Hexadecimal	1B	1D	52	n1	n2
	Decimal	27	29	82	n1	n2

[Defined Area]	Thermal	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
	Slip	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
	Validation	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Moves the printing position from the current position to the (n1 + n2 x 256) dot position.
This command is ignored if the print region is exceeded.
When (n1 + n2 x 256) ≧ 32768, it moves {65536 – (n1 + n2 x 256)} dots in the left direction.
When (n1 + n2 x 256) < 32768, it moves (n1 + n2 x 256)} dots in the right direction.
The right margin is also the reference for upside-down printing.

<Thermal>
The left margin is also the reference for upside-down printing.

<Slip>, <Validation>
The right margin is also the reference for upside-down printing.

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]
Thermal : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)
Slip : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)
Validation : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)

[Initial Value]
Thermal : n = 0
Slip : n = 0
Validation : n = 0

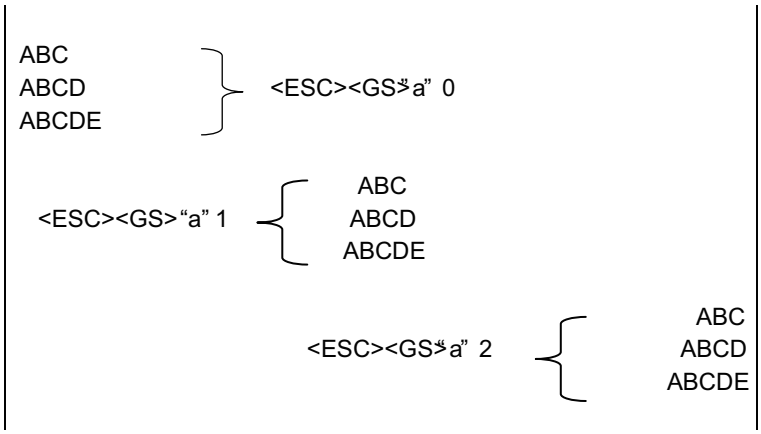
[Function] This specifies position alignment for all print data in one line, in the set print region.

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

<Slip>, <Validation>

When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.



3-3-7) Download

ESC & c1 c2 n d1 . . . d48

[Name] Register 12 x 24 dot font download characters

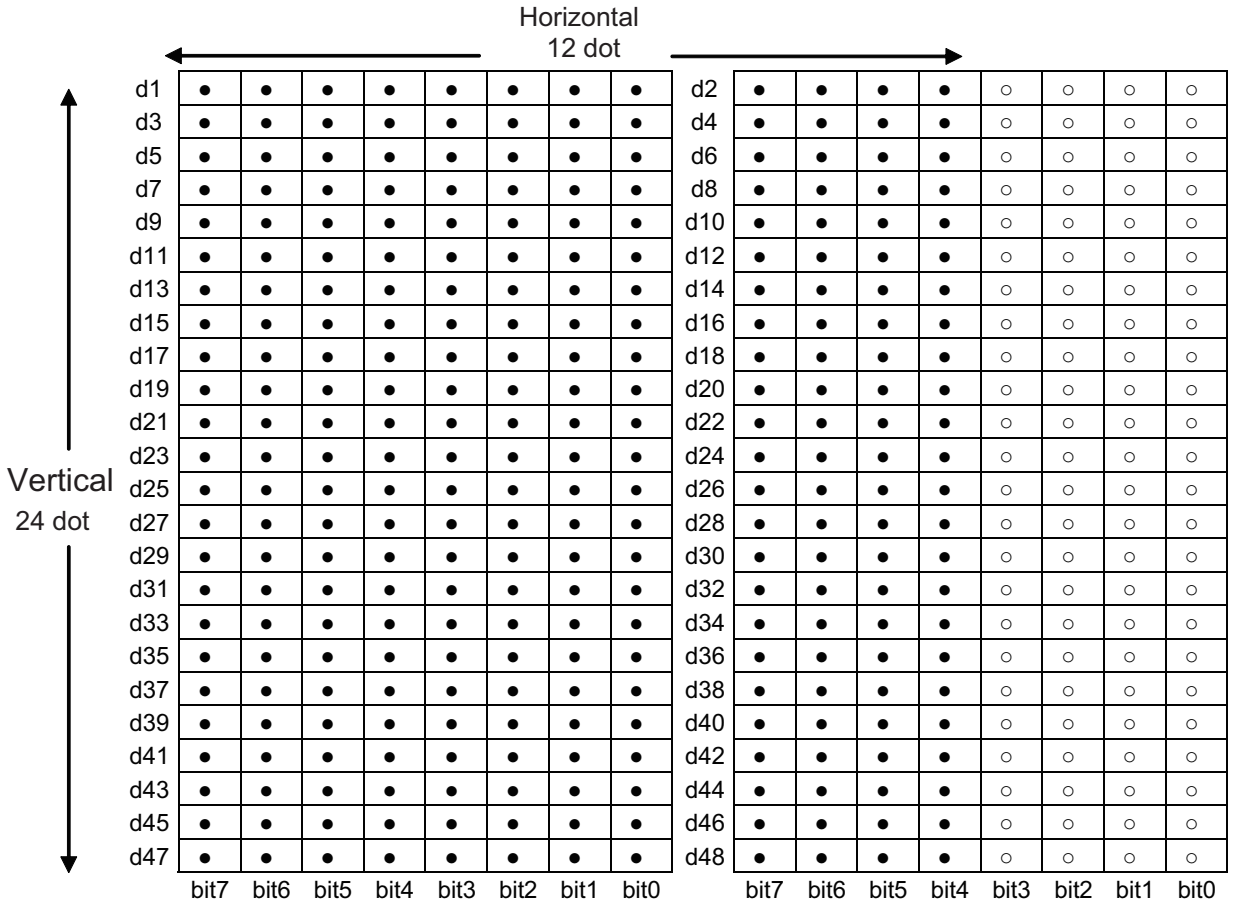
[Code]									
	ASCII	ESC	&	c1	c2	n	d1	..	d48
	Hexadecimal	1B	26	c1	c2	n	d1	..	d48
	Decimal	27	38	c1	c2	n	d1	..	d48

[Defined Area]	Thermal	:	c1 = 1, 49, c2 = 1, 49, 32 ≦ n ≦ 127, 0 ≦ d ≦ 255
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Registers 12 x 24 dot font download characters to the nth address.
Download characters can be registered to <20>H to <7F>H. (96 characters can be registered for each font.)
Those already registered to these addresses are overwritten.
When parameters c1 and c2 and n are outside of the defined area, subsequent data is handled as normal data.



● : Font data
○ : Invalid data

<Slip>, <Validation>

Only registration is possible.
Registration data is printable after switching to thermal.

ESC & c1 c2 n

[Name] Delete 12 x 24 dot font download characters

[Code]

ASCII	ESC	&	c1	c2	n
Hexadecimal	1B	26	c1	c2	n
Decimal	27	38	c1	c2	n

[Defined Area]
Thermal : c1 = 1, 49, c2 = 0, 48, 32 ≦ n ≦ 127
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Deletes 12 x 24 dot font download characters registered to the nth address.

<Slip>, <Validation>

Deleting is possible.

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

[Name] Register download characters

[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] Thermal : -
Slip : 33 ≦ n1 ≦ n2 ≦ 127 (21h ≦ n1 ≦ n2 ≦ 7Fh), m = 0, 128 (00h, 80h), 0 ≦ d1 to d7 ≦ 255
Validation : 33 ≦ n1 ≦ n2 ≦ 127 (21h ≦ n1 ≦ n2 ≦ 7Fh), m = 0, 128 (00h, 80h), 0 ≦ d1 to d7 ≦ 255

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

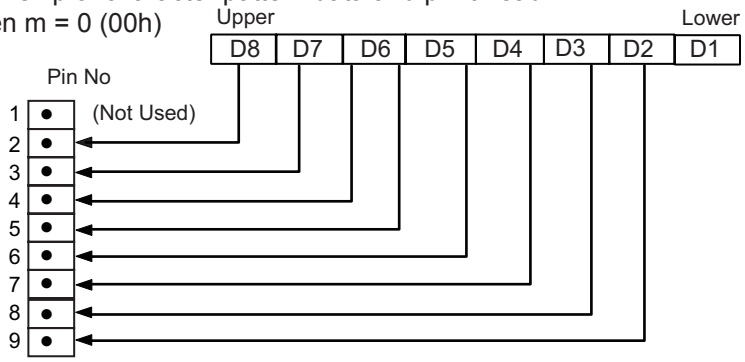
Only registration is possible.
Registration data is printable after switching to slip or validation.

<Slip>, <Validation>

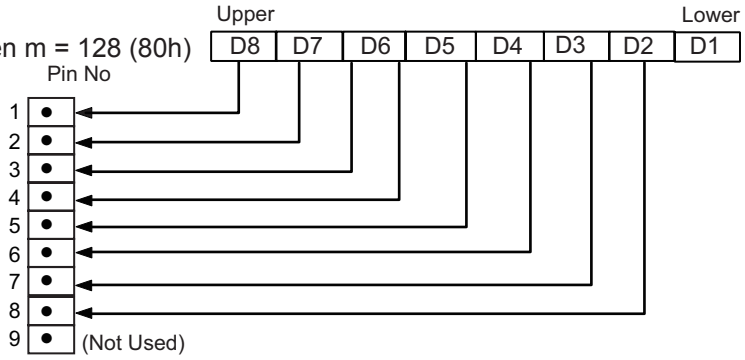
Registers download characters to the specified character code.
A maximum of 22 download characters can be registered for 7 x 9 and 5 x 9 fonts.
The range of the location to write download characters is specified by n1 and n2. (When there is one character to register, n1 = n2.)
If one has been already 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.
Registered data is shared by slip and validation.

Relationship of character pattern data and print head.

1. When m = 0 (00h)

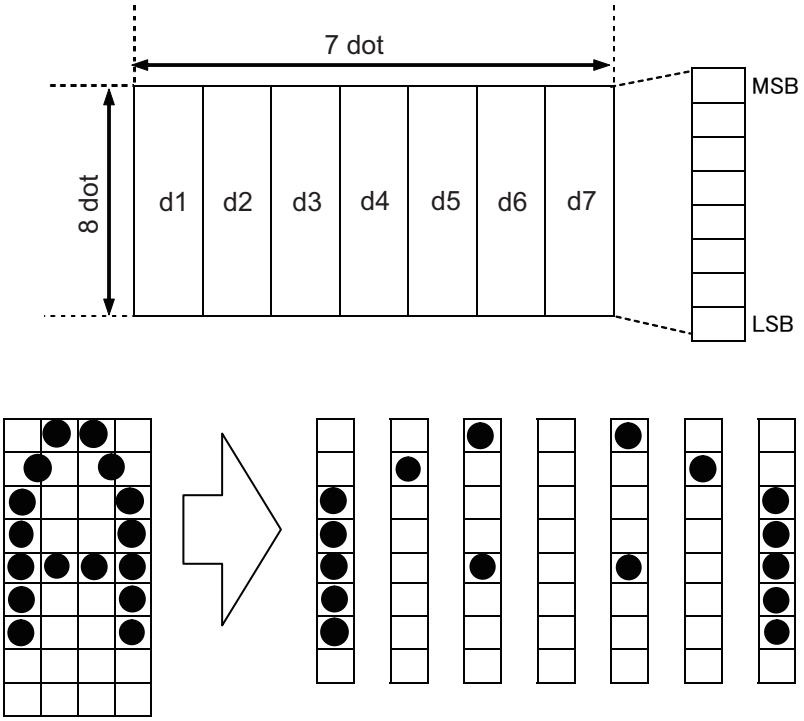


2. When m = 128 (80h)



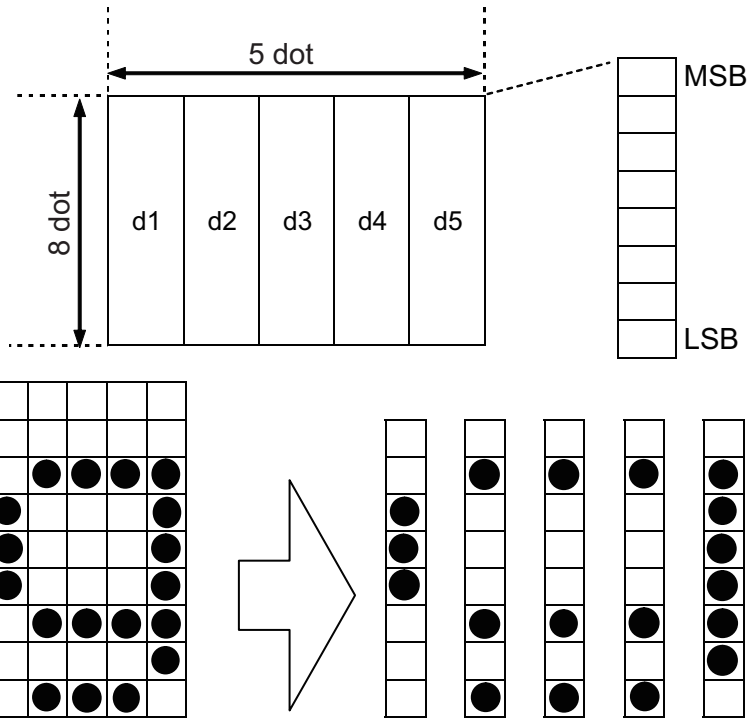
(Note) • When registering 7 x 9 fonts, dots adjacent in the horizontal direction do not print.
•When character rotation is specified, 7 x 9 font registered characters cannot be printed. 5 x 9 font characters are always printed.

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



ESC & NUL n1 n2 m d1 d2 d3 d4 d5 d6 d7
Code (Hexadecimal) 1B 26 00 21 21 80 3E 40 88 00 88 40 3E
(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 % N

[Name] Specify/cancel ANK download characters

[Code]

ASCII	ESC	%	n
Hexadecimal	1B	25	n
Decimal	27	37	n

[Defined Area]
Thermal : n = 0, 1, 48, 49
Slip : n = 0, 1, 48, 49
Validation : n = 0, 1, 48, 49

[Initial Value]
Thermal : Cancel ANK download character
Slip : Cancel ANK download character
Validation : Cancel ANK download character

[Function] Specifies/cancels ANK download characters

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

<Print example of download characters>
1. Registration of ANK download character (ESC & c1 c2 n d1…d48)
2. Specify ANK download characters (ESC % n (n = 1))
3. Print ANK download characters

(Note) The settings using this command are valid for all stations and modes.

3-3-8) Bit Image Graphics

ESC K n1 n2 d1 … dk

[Name] Standard density bit image

[Code]

ASCII	ESC	K	n1	n2	d1	..	dk
Hexadecimal	1B	4B	n1	n2	d1	..	dk
Decimal	27	75	n1	n2	d1	..	dk

[Defined Area]

Thermal :

1 ≦ {(n1 + n2 x 256) x 3} ≦ printable region

k = (n1 + n2 x 256)

0 ≦ d ≦ 255

Slip :

1 ≦ (n1 + n2 x 256) ≦ printable region (total dot count)

k = (n1 + n2 x 256)

0 ≦ d ≦ 255

Validation :

1 ≦ (n1 + n2 x 256) ≦ printable region (total dot count)

k = (n1 + n2 x 256)

0 ≦ d ≦ 255

[Initial Value]

Thermal : -

Slip : -

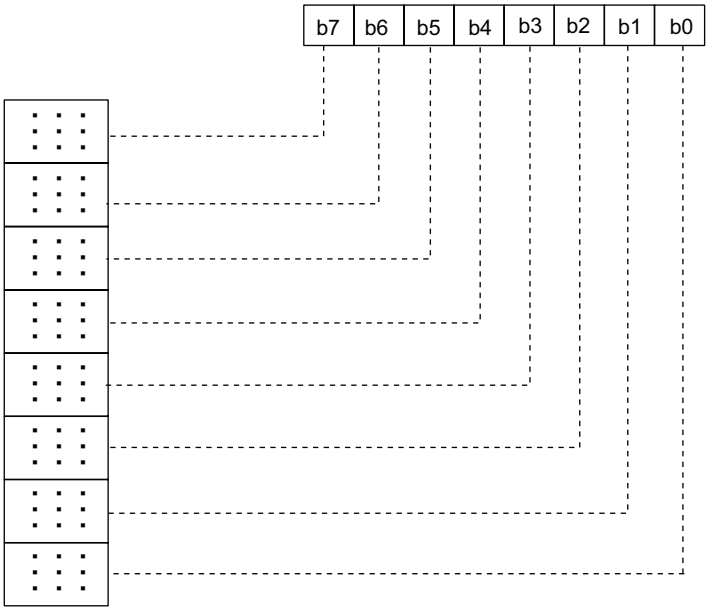
Validation : -

[Function]

<Thermal>

Prints bit images using 3 dots wide and 3 dots high per 1 dot of input data.
The following shows the details of data processing with this command.

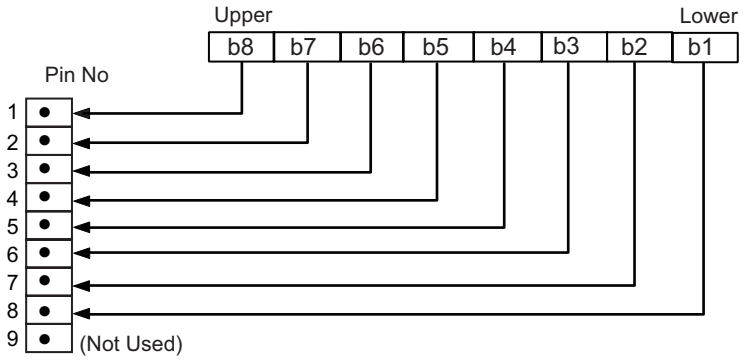
- When {(n1 + n2 x 256) x 3} exceeds the printable region, only the data in the printing region is printed.
- When {(n1 + n2 x 256) x 3} exceeds the currently set printable region, only the data in the printing region is printed.
  At this time, all data for the print region is discarded.
- If the current position already exceeds the print region, this command discards all data.



<Slip>, <Validation>

This command prints bit images with only the data count determined by n1.
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.
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 … dk

[Name] High density bit image

[Code]								
	ASCII	ESC	L	n1	n2	d1	..	dk
	Hexadecimal	1B	4C	n1	n2	d1	..	dk
	Decimal	27	76	n1	n2	d1	..	dk

[Defined Area]

Thermal : 1 ≦ {(n1 + n2 x 256) ≦ printable region

k = (n1 + n2 x 256)

0 ≦ d ≦ 255

Slip : 1 ≦ (n1 + n2 x 256) ≦ printable region (total half-dot count)

k = (n1 + n2 x 256)

0 ≦ d ≦ 255

Validation : 1 ≦ (n1 + n2 x 256) ≦ printable region (total half-dot count)

k = (n1 + n2 x 256)

0 ≦ d ≦ 255

[Initial Value]

Thermal : -

Slip : -

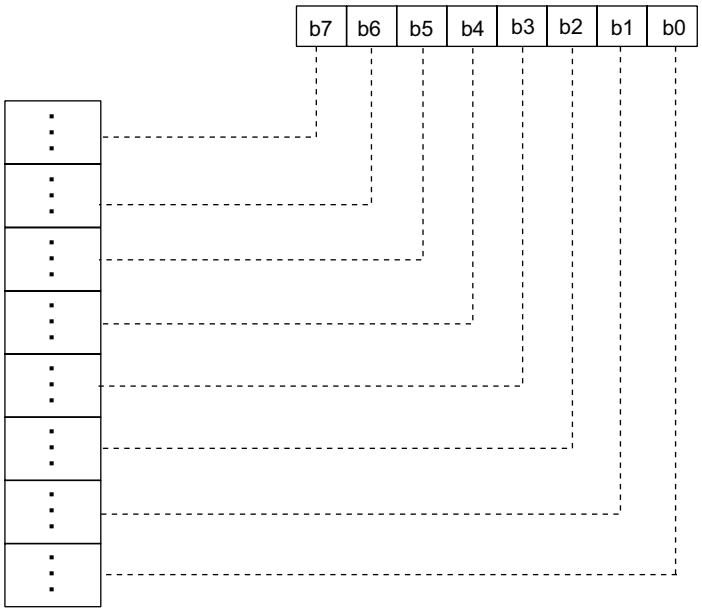
Validation : -

[Function]

<Thermal>

Prints bit images using 1 dots wide and 3 dots high per 1 dot of input data.
The following shows the details of data processing with this command.

- When (n1 + n2 x 256) exceeds the printable region, only data in the print region is printed.
- When (n1 + n2 x 256) exceeds the currently set printable region, only the data in the printing region is printed.
  At this time, all data for the print region is discarded.
- If the current position already exceeds the print region, this command discards all data.



<Slip>, <Validation>

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).
When printing double-density bit images, dots adjacent in the horizontal direction do not print.
After printing the bit image, the printer automatically returns to the character mode.
When page mode is selected, all data is received and discarded.

ESC k n1 n2 d1 … dk

[Name] Fine bit image

[Code]								
ASCII	ESC	k	n1	n2	d1	..	dk
Hexadecimal	1B	6B	n1	n2	d1	..	dk
Decimal	27	107	n1	n2	d1	..	dk

[Defined Area] Thermal : n2 = 0

1 ≦ {(n1 + n2 x 256) x 8} ≦ printable region

k = {(n1 + n2 x 256) x 24}

0 ≦ d ≦ 255

Slip : -

Validation : -

[Initial Value] Thermal : -

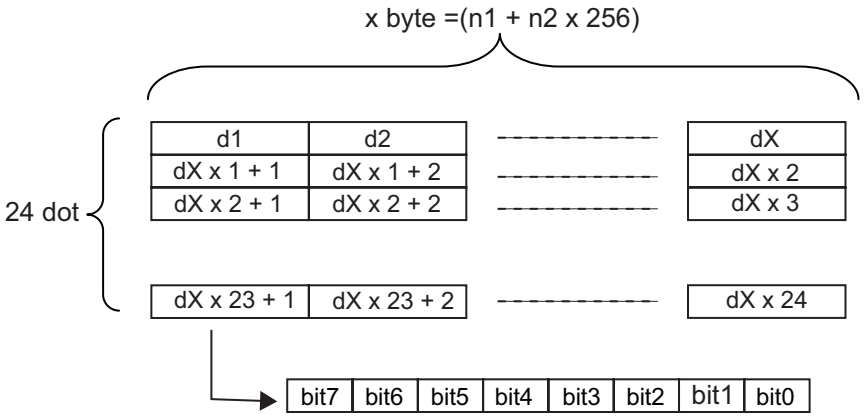
Slip : -

Validation : -

[Function]

<Thermal>

Prints bit images using 1 dots wide and 1 dots high per 1 dot of input data.
The following shows the details of data processing with this command.
• When {(n1 + n2 x 256) x 8} exceeds the printable region, only the data in the printing region is printed.
• When {(n1 + n2 x 256) x 8} exceeds the currently set printable region, only the data in the printing region is printed.
At this time, all data for the print region is discarded.
• If the current position already exceeds the print region, this command discards all data.



<Slip>, <Validation>

All data received and discarded.

ESC X n1 n2 d1 … dk

[Name] Fine density bit image (Wire-dot, 24 pin compatible)

[Code]

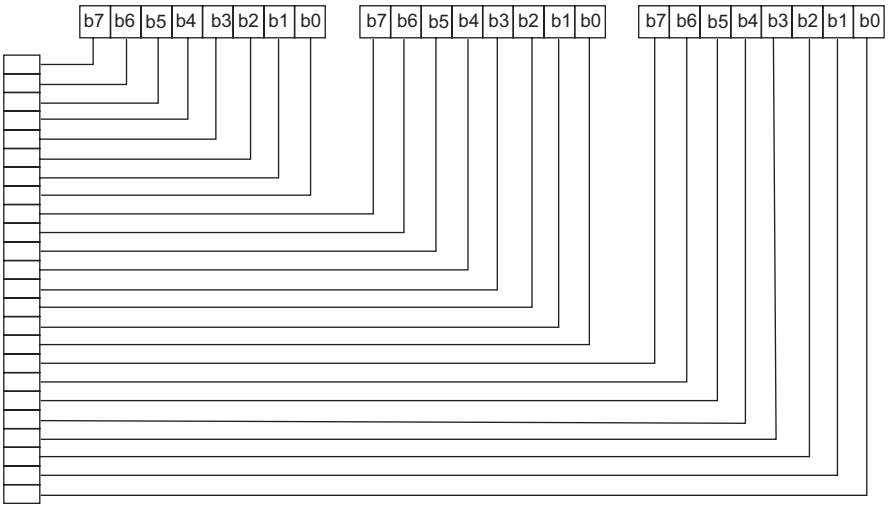
ASCII	ESC	X	n1	n2	d1	..	dk
Hexadecimal	1B	58	n1	n2	d1	..	dk
Decimal	27	88	n1	n2	d1	..	dk

[Defined Area]
Thermal : 1 ≦ (n1 + n2 x 256) ≦ printable region
k = {(n1 + n2 x 256) x 3}
0 ≦ d ≦ 255
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]
<Thermal>

Prints input bit images with 8 dots/mm resolution for both horizontal and vertical.
The following shows the details of data processing with this command.
• When {(n1 + n2 x 256) x 3} exceeds the printable region, only the data in the printing region is printed.
• When {(n1 + n2 x 256) x 3} exceeds the currently set printable region, only the data in the printing region is printed.
At this time, all data for the print region is discarded.
• If the current position already exceeds the print region, this command discards all data.



<Slip>, <Validation>

All data received and discarded.

ESC ^ m n1 n2 d1 d2 … dk

[Name]	9 Dot bit image									
[Code]	ASCII	ESC	^	m	n1	n2	d1	d2	..	dk
	Hexadecimal	1B	5E	m	n1	n2	d1	d2	..	dk
	Decimal	27	94	m	n1	n2	d1	d2	..	dk

[Defined Area]	Thermal	:	-
	Slip	:	0 ≦ m ≦ 1 (“0” ≦ m ≦ “1”)
	Validation	:	0 ≦ m ≦ 1 (“0” ≦ m ≦ “1”)
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

All data received and discarded.

<Slip>, <Validation>

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.
  When page mode is selected, all data is received and discarded.

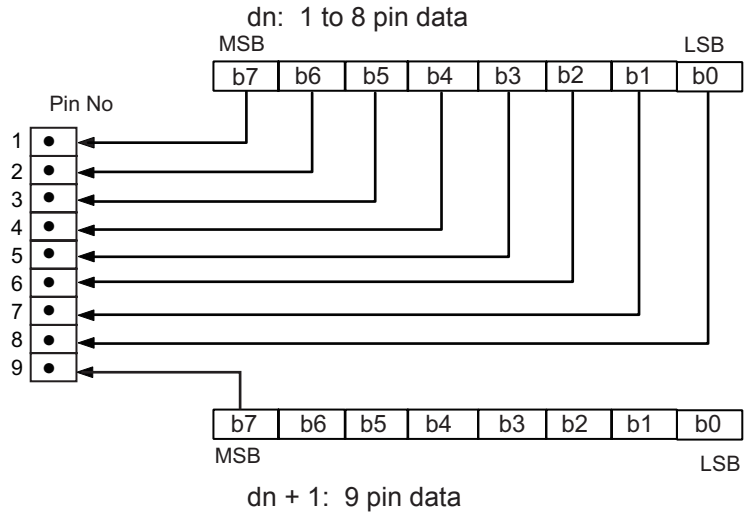
(Note) • Data exceeding the maximum number of dots or the right margin is ignored.

• Total number of dots and total number of half-dots follows the memory switch setting. (See the specifications manual)

• If m is outside of the definition, data after n1 is processed as normal data.

• 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.



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	ESC	FS	q	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	.. dk]n
	Hexadecimal	1B	1C	71	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	.. dk]n
	Decimal	27	28	113	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	.. dk]n

[Defined Area]

Thermal :
$1 \leqq n \leqq 255$
$0 \leqq xn1 \leqq 255,\ 0 \leqq xn2 \leqq 3 \quad 1 \leqq (xn1 + xn2 \times 256) \leqq 1023$
$0 \leqq yn1 \leqq 255,\ 0 \leqq yn2 \leqq 1 \quad 1 \leqq (yn1 + yn2 \times 256) \leqq 288$
$0 \leqq d \leqq 255$
$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

Slip :
$1 \leqq n \leqq 255$
$0 \leqq xn1 \leqq 255,\ 0 \leqq xn2 \leqq 3 \quad 1 \leqq (xn1 + xn2 \times 256) \leqq 1023$
$0 \leqq yn1 \leqq 255,\ 0 \leqq yn2 \leqq 1 \quad 1 \leqq (yn1 + yn2 \times 256) \leqq 288$
$0 \leqq d \leqq 255$
$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

Validation :
$1 \leqq n \leqq 255$
$0 \leqq xn1 \leqq 255,\ 0 \leqq xn2 \leqq 3 \quad 1 \leqq (xn1 + xn2 \times 256) \leqq 1023$
$0 \leqq yn1 \leqq 255,\ 0 \leqq yn2 \leqq 1 \quad 1 \leqq (yn1 + yn2 \times 256) \leqq 288$
$0 \leqq d \leqq 255$
$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

[Initial Value]
Thermal : No registration
Slip : No registration
Validation : No registration

[Function]
Register logo
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 data
- k: Logo data count

This command should be specified at the top of the line.
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 re-register 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 aborted.(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 4 Mbits (512 Kbytes 524,288 bytes).
However, 4 Kbytes (4,096 bytes) are kept as parameter information separate to the data so the data region memory capacity is 520,192 Bytes.

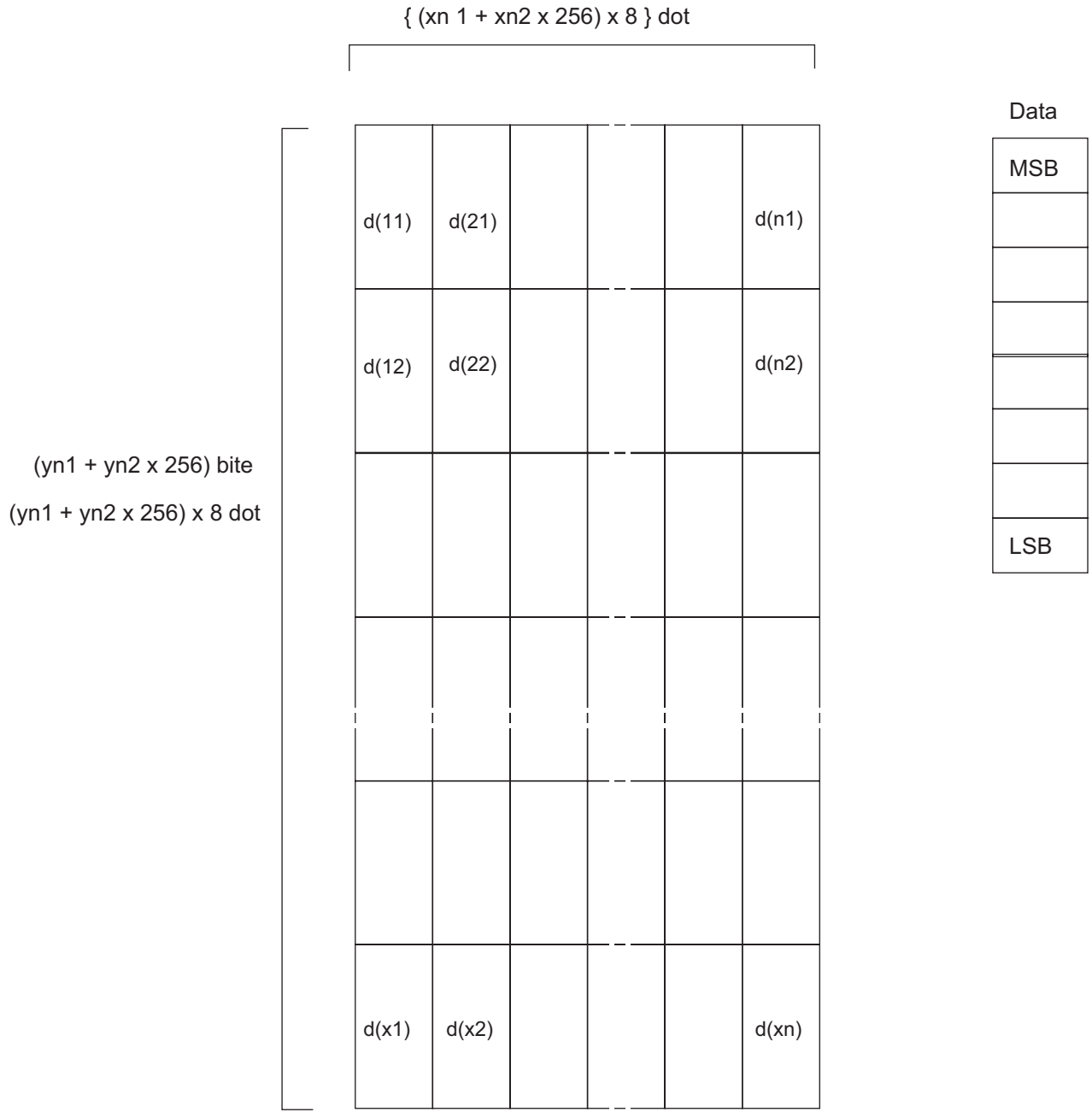
Ex.: When the registered data size per each one is 6 Kbytes (6,144 bytes), it is possible to register 520,192/6144 = 84.

(Note) Registration data shared by all stations, and modes.

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.

Relationship of logo and registered data

xn = xn1 + xn2 x 256, yn = yn1 + yn2 x 256



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] Thermal : 1 ≦ n ≦ 255

0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”)

Slip : 1 ≦ n ≦ 255

0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”)

Validation : 1 ≦ n ≦ 255

0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”)

[Initial Value] Thermal : -

Slip : -

Validation : -

[Function] Prints the logo of registration number n registered using the logo registration command ESC FS q according to the print mode m.

n: Logo Specification

n	Function
1 to 255	Specified logo number

m: Print Mode

m	Logo Print Mode
0, 48	Normal mode
1, 49	Horizontal double size mode
2, 50	Vertical double size mode
3, 51	Double high/wide mode

• 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.))
• It is not possible to print with other data in the same line (characters, bit images, bar codes).
• Form feed obeys the vertical print size of the logo.
• 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 horizontal print region, the portion exceeding the area is not printed.
• When page mode is selected, supports only vertical double high, and horizontal double wide modes.
• Logos are printed according to the following command settings.
• Left margin (ESC l n)
• Right margin (ESC Q n)
• Position alignment (ESC GS a n)
• Absolute position movement (ESC GS A n1 n2)
• Relative position movement (ESC GS R n1 n2)
• Horizontal tab (HT)
• Upside-down printing (SI)

ESC RS L m

[Name] Logo batch control

[Code]					
	ASCII	ESC	RS	L	m
	Hexadecimal	1B	1E	4C	m
	Decimal	27	30	76	m

[Defined Area]	Thermal	:	0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”), m = 255
	Slip	:	0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”), m = 255
	Validation	:	0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”), m = 255
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Controls logos specified by the parameter m.
After execution, resets the printer.

m: Print Mode

m	Logo Control Mode
0, 48	Normal mode batch printing
1, 49	Horizontal double size mode batch printing
2, 50	Vertical double size mode batch printing
3, 51	Double high/wide mode batch printing
255	Logo batch delete

• 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.))
• Form feed obeys the vertical print size of the logo.
• Print modes, excluding upside-down printing (enhanced, double, underline, character size, black/white inverted, and 90˚ right rotation) are unaffected by logos.
• Prints logo number as shown below in the line above each logo print.
This line is printed with ANK characters, so currently set adornment is applied.
(Print Ex.) “LOGO No. 1” (Each logo number is printed at the “1” position.)
• If the logo horizontal print size exceeds the horizontal print region, the portion exceeding the area is not printed.
• This test print is affected by the following command settings.
  • Left margin (ESC l n)
  • Right margin (ESC Q n)
  • Position alignment (ESC GS a n)
  • Print region setting (ESC RS A n)
  • Upside-down printing (SI)
• After batch printing output is ended, paper is fed automatically to the cutting position, paper is cut (if the printer is equipped with a cutter), and the printer is reset.

<Slip>, <Validation>
When page mode is selected, four bytes ignored.

3-3-10) Bar Codes

ESC b n1 n2 n3 n4 d1 . . . dk RS

[Name] Print bar code

[Code]											
	ASCII	ESC	b	n1	n2	n3	n4	d1	..	dk	RS
	Hexadecimal	1B	62	n1	n2	n3	n4	d1	..	dk	1E
	Decimal	27	98	n1	n2	n3	n4	d1	..	dk	30

[Defined Area] Thermal : 0 ≦ n1 ≦ 8, 48 ≦ n1 ≦ 56 (“0” ≦ n1 ≦ “8”)
1 ≦ n2 ≦ 4, 49 ≦ n2 ≦ 52 (“1” ≦ n2 ≦ “4”)
1 ≦ n4 ≦ 255
n3 (bar code mode), d (bar code data),
Defined area of k (bar code data count) is different depending on the bar code type.
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]
<Thermal>

Bar code printing is executed according to the following parameters.
If n1, n2, n3 and n4 are acquired and detected to be out of the defined area, data up to RS is discarded.

• n1: Bar Code Type Selection

n1	Bar Codes Types
0, 48	UPC-E
1, 49	UPC-A
2, 50	JAN/EAN8
3, 51	JAN/EAN13
4, 52	Code39
5, 53	ITF
6, 54	Code128
7, 55	Code93
8, 56	NW-7

• n2: Character Selection Under Bar Code, and Line Feed Addition Selection

n2	Under-bar character selection and added line feed selection
1, 49	No added under-bar charactersExecutes a form feed after bar code is printed.
2, 50	Added under-bar charactersExecutes a form feed after bar code is printed.
3, 51	No added under-bar charactersDoes not execute a form feed after bar code is printed.
4, 52	Added under-bar charactersDoes not execute a form feed after bar code is printed.

• n3: Bar Code Mode Selection

n3	Bar Codes Types		
	UPC-E, UPC-A, JAN/EAN8 JAN/EAN13, Code128, Code93	Code39, NW-7	ITF
1, 49	Minimum module 2 dots	Narrow : Wide = 2: 6 dots	Narrow : Wide = 2: 5 dots
2, 50	Minimum module 3 dots	Narrow : Wide = 3: 9 dots	Narrow : Wide = 4:10 dots
3, 51	Minimum module 4 dots	Narrow : Wide = 4:12 dots	Narrow : Wide = 6:15 dots
4, 52	---	Narrow : Wide = 2: 5 dots	Narrow : Wide = 2: 4 dots
5, 53	---	Narrow : Wide = 3: 8 dots	Narrow : Wide = 4: 8 dots
6, 54	---	Narrow : Wide = 4:10 dots	Narrow : Wide = 6:12 dots
7, 55	---	Narrow : Wide = 2: 4 dots	Narrow : Wide = 2: 6 dots
8, 56	---	Narrow : Wide = 3: 6 dots	Narrow : Wide = 3: 9 dots
9, 57	---	Narrow : Wide = 4: 8 dots	Narrow : Wide = 4:12 dots

• n4: Bar code height (dot count)
Spec. 1: When the height of the bar code is more than the form feed amount, the form feed amount is automatically doubled.
Spec. 2: Line feed according to (bar code height + under-bar characters)

• k (bar code data count), d (bar code data)

Bar Codes Types	Defined area of k	Defined area of d
UPC-E	11 ≦ k ≦ 12	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”)
UPC-A	11 ≦ k ≦ 12	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”)
JAN/EAN8	7 ≦ k ≦ 8	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”)
JAN/EAN13	12 ≦ k ≦ 13	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”)
Code39	1 ≦ k	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”), 65 ≦ d ≦ 90 (“A” ≦ d ≦ “Z”) 32, 36, 37, 43, 45, 46, 47(SP, “$”, “%”, “+”, “-”, “.”, “/”)
ITF	1 ≦ k For odd numbers 0 data is automatically added to the top.	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”)
Code128	1 ≦ k	0 ≦ d ≦ 127
Code93	1 ≦ k	0 ≦ d ≦ 127
NW-7	1 ≦ k	48 ≦ d ≦ 57 (“0” ≦ d ≦ “9”), 65 ≦ d ≦ 68 (“A” ≦ d ≦ “D”) 36, 43, 45, 46, 47, 58 (“$”, “+”, “-”, “.”, “/”, “:”) 97, 98, 99, 100 (“a,” “b,” “c,” “d”)

• UPC-E: k = 11 (or 12)
The 12th check digit is automatically applied, so it is ignored even if specified.
Command is ignored if the data cannot be shortened. Data conversion to rectangles is automatic.
• UPC-A: k = 11 (or 12)
The 12th check digit is automatically applied, so it is ignored even if specified.
• JAN/EAN -8: k = 7 (or 8)
The 8th check digit is automatically applied, so it is ignored even if specified.
• JAN/EAN -13: k = 12 (or 13)
The 13th check digit cannot be automatically applied, so it is ignored even if specified.
• CODE39: k is freely set, and maximum value differs according to the mode.
Start and stop codes (*) are automatically included.
• ITF: k is freely set, and maximum value differs according to the mode.
If the data is an odd line, 0 data is automatically appended to the top.
• CODE128: k is freely set, and maximum value differs according to the mode and print character type.
Check character is automatically appended.
• CODE93: k is freely set, and maximum value differs according to the mode and print character type.
The start/stop code (□) is automatically appended.
• NW7: k is freely set, and maximum value differs according to the mode and print character type.
Both start/stop codes are included in the data (but not automatically applied).

3-3-11) Cutter Control

ESC d n

[Name] Auto-cutter:

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

[Defined Area]	Thermal	:	0 ≦ d ≦ 3, 48 ≦ d ≦ 51 (“0” ≦ d ≦ “3”)
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Executes the auto-cutter.
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. Print data in line buffer is printed before a full cut. Models not provided the auto-cutter execute only functions other than the cutting operation (printing/paper feed operations).
1, 49	Partial cut at the current position. Print data in line buffer is printed before a partial cut. Models not provided the auto-cutter execute only functions other than the cutting operation (printing/paper feed operations).
2, 50	Paper is fed to cutting position, then a full cut. Print data in line buffer is printed before the operation described above. Models not provided the auto-cutter execute only functions other than the cutting operation (printing/paper feed operations).
3, 51	Paper is fed to cutting position, then a partial cut. Print data in line buffer is printed before the operation described above. Models not provided the auto-cutter execute only functions other than the cutting operation (printing/paper feed operations).

(*) 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.

<Slip>, <Validation>

Three bytes ignored

3-3-12) External Device Drive

ESC BEL n1 n2

[Name] Set external drive device 1 pulse width

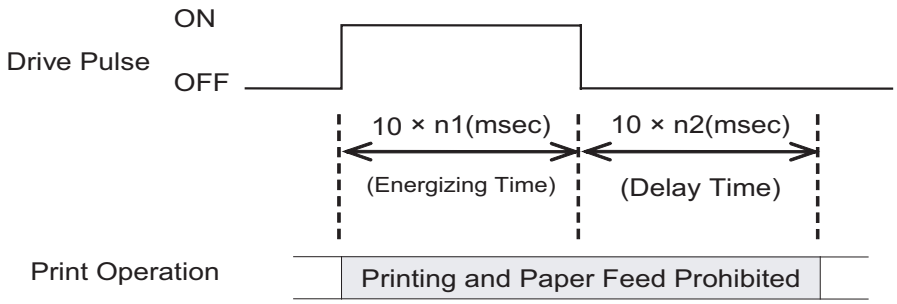
[Code]

ASCII	ESC	BEL	n1	n2
Hexadecimal	1B	07	n1	n2
Decimal	27	7	n1	n2

[Defined Area]
Thermal : 1 ≦ n1 ≦ 127, 1 ≦ n2 ≦ 127
Slip : 1 ≦ n1 ≦ 127, 1 ≦ n2 ≦ 127
Validation : 1 ≦ n1 ≦ 127, 1 ≦ n2 ≦ 127

[Initial Value]
Thermal : n1 = 20 (Energizing time: 200 msec)
n2 = 20 (Delay time: 200 msec)
Slip : n1 = 20 (Energizing time: 200 msec)
n2 = 20 (Delay time: 200 msec)
Validation : 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.
• Energizing time = 10 x n1 (ms)
• Delay time = 10 x n2 (ms)



After printing, this is executed by BEL (External device 1 drive instruction) or FS (External device 1 drive instruction).
Handled in the following way when n1 and n2 are out of range.
• When n1 = 0, or n2 = 0, this command is ignored.
• When n1 > 127 is specified, n1 = 127; when n2 > 127 is specified, n2 = 127.

(Note) The settings using this command are valid for all stations and modes.

BEL

[Name] External device 1 drive instruction

[Code] ASCII BEL
Hexadecimal 07
Decimal 7

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function] Executes the external device drive conditions set according to the command to set the external drive device pulse width (ESC BEL n1 n2).
As with other commands, it 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

[Code] ASCII FS
Hexadecimal 1C
Decimal 28

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function] Executes the external device drive conditions set according to the command to set the external drive device pulse width (ESC BEL n1 n2).
As with other commands, it 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.

SUB

[Name] External device 2 drive instruction
[Code] ASCII SUB
Hexadecimal 1A
Decimal 26

[Defined Area] Thermal : -
Slip : -
Validation : -
[Initial Value] Thermal : -
Slip : -
Validation : -

[Function] Drives external device 2. The energizing time and delay time for the external device 2 are fixed at 200 ms each.
As with other commands, it 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.

EM

[Name] External device 2 drive instruction
[Code] ASCII EM
Hexadecimal 19
Decimal 25

[Defined Area] Thermal : -
Slip : -
Validation : -
[Initial Value] Thermal : -
Slip : -
Validation : -

[Function] Drives external device 2.The energizing time and delay time for the external device 2 are fixed at 200 ms each.
As with other commands, it 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.

ESC GS BEL m t1 t2

[Name] Ring buzzer

[Code]							
	ASCII	ESC	GS	BEL	m	t1	t2
	Hexadecimal	1B	1D	07	m	t1	t2
	Decimal	27	29	7	m	t1	t2

[Defined Area]
Thermal : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50 (“1” ≦ m ≦ “2”)
1 ≦ t1 ≦ 255, 1 ≦ t2 ≦ 255
Slip : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50 (“1” ≦ m ≦ “2”)
1 ≦ t1 ≦ 255, 1 ≦ t2 ≦ 255
Validation : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50 (“1” ≦ m ≦ “2”)
1 ≦ t1 ≦ 255, 1 ≦ t2 ≦ 255

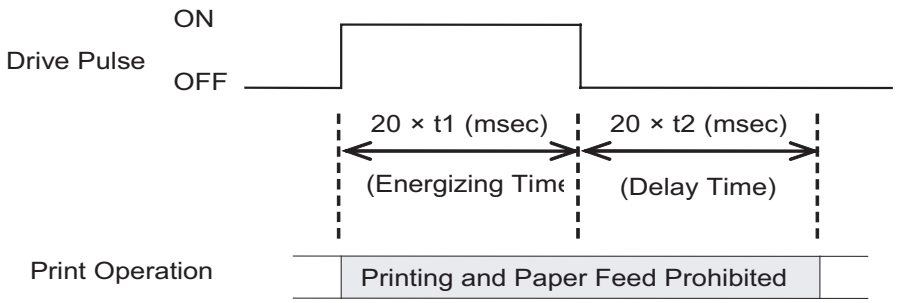
[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function] Rings buzzer.
m specifies the buzzer drive terminal.

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

t1 specifies the energizing time; t2 specifies the delay time.
- Energizing time = 20 msec x t1
- Delay time = 20 msec x t2

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 care is needed.))



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	m	n1	n2
	Decimal	27	29	25	17	m	n1	n2

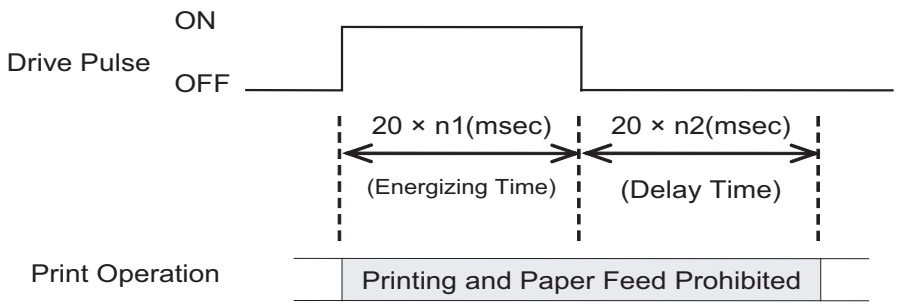
[Defined Area]
Thermal : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50, (“1” ≦ m ≦ “2”)
0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
Slip : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50, (“1” ≦ m ≦ “2”)
0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255
Validation : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50, (“1” ≦ m ≦ “2”)
0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255

[Initial Value]
Thermal : n1 = 0, n2 = 0
Slip : n1 = 0, n2 = 0
Validation : 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 n1
- Delay time = 20 msec x n2



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

(Note) The settings using this command are valid for all stations and modes.

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]
Thermal : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50, (“1” ≦ m ≦ “2”)
1 ≦ n1 ≦ 20, n2 = 0
Slip : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50, (“1” ≦ m ≦ “2”)
1 ≦ n1 ≦ 20, n2 = 0
Validation : 1 ≦ m ≦ 2, 49 ≦ m ≦ 50, (“1” ≦ m ≦ “2”)
1 ≦ n1 ≦ 20, n2 = 0

[Initial Value]
Thermal : -
Slip : -
Validation : -

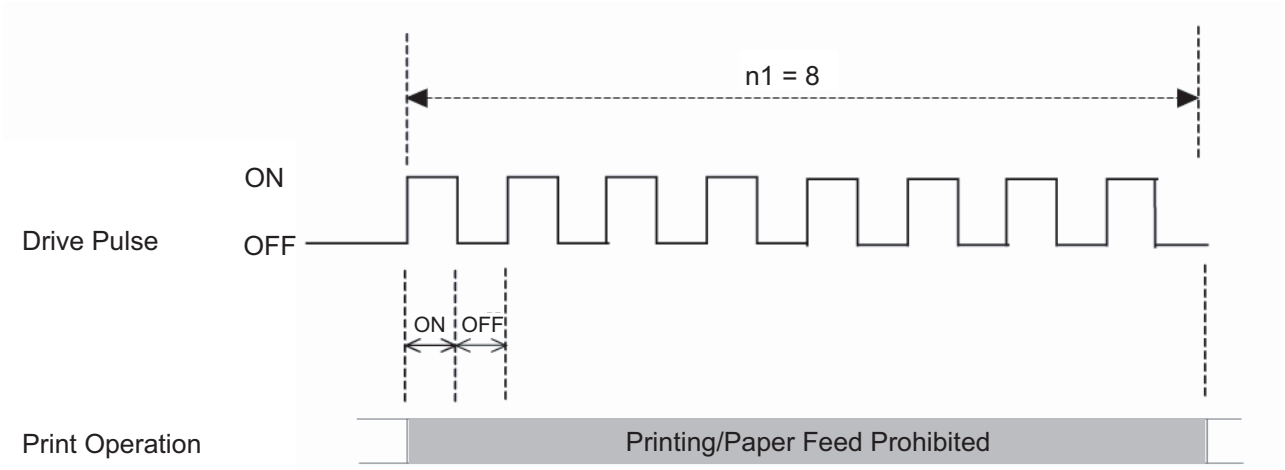
[Function] Repeatedly drives the buzzer according to the ON/OFF conditions set by the external buzzer drive pulse condition command ESC GS EM DC1 m t1 t2.

m specifies the buzzer drive terminal to drive.

m	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 while 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 FEED switch or the RELEASE switch while the buzzer is ringing, or opening the receipt cover or the slip cover.

[Ex.:]



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

3-3-13) Print Settings

ESC RS d n

[Name] Set print density

[Code]

ASCII	ESC	RS	d	n
Hexadecimal	1B	1E	64	n
Decimal	27	30	100	n

[Defined Area]
Thermal : 0 ≦ n ≦ 15
48 ≦ n ≦ 57 (”0” ≦ n ≦ “9”), 65 ≦ n ≦ 70 (”A” ≦ n ≦ “F”)
Slip : -
Validation : -

[Initial Value]
Thermal : Memory switch setting
Slip : -
Validation : -

[Function]
<Thermal>
Sets print density.
This command stops printing to be executed.

n	Print Density
0, 48	Print density 1.3
1, 49	Print density 1.2
2, 50	Print density 1.1
3, 51	Print density 1.0
4, 52	Print density 0.9
5, 53	Print density 0.8
6, 54	Print density 0.7
7, 55	(Reserved)
8, 56	(Reserved)
9, 57	(Reserved)
10, 65	(Reserved)
11, 66	(Reserved)
12, 67	(Reserved)
13, 68	(Reserved)
14, 69	(Reserved)
15, 70	(Reserved)

<Slip>, <Validation>
Only setting is valid
Setting is valid after switching to thermal.

ESC RS r n

[Name] Set printing speed

[Code]

ASCII	ESC	RS	r	n
Hexadecimal	1B	1E	72	n
Decimal	27	30	114	n

[Defined Area]
Thermal : 0 ≦ n ≦ 2
48 ≦ n ≦ 50 (“0” ≦ n ≦ “2”)
Slip : -
Validation : -

[Initial Value]
Thermal : Memory switch setting
Slip : -
Validation : -

[Function]

<Thermal>

Sets print speed.
This command stops printing to be executed.

n	Print Speed
0, 48	High speed
1, 49	Mid-speed
2, 50	Slow speed

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

3-3-14) Status

ESC RS a n

[Name] Set status transmission conditions

[Code]

ASCII	ESC	RS	a	n
Hexadecimal	1B	1E	61	n
Decimal	27	30	97	n

[Defined Area]

Thermal	:	0 ≦ n ≦ 3, 48 ≦ n ≦ 51, (“0” ≦ n ≦ “51”)
Slip	:	0 ≦ n ≦ 3, 48 ≦ n ≦ 51, (“0” ≦ n ≦ “51”)
Validation	:	0 ≦ n ≦ 3, 48 ≦ n ≦ 51, (“0” ≦ n ≦ “51”)

[Initial Value]

Thermal	:	DIPS switches/Memory switch setting
Slip	:	DIPS switches/Memory switch setting
Validation	:	DIPS switches/Memory switch setting

[Function] Sets the status transmission conditions. See Appendix 2 for details regarding ASB status.
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.

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.

(Note) The settings using this command are valid for all stations and modes.

ESC ACK SOH

[Name] Real-time printer status (ASB Status)

[Code]				
	ASCII	ESC	ACK	SOH
	Hexadecimal	1B	06	01
	Decimal	27	6	1

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[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 to the host in real time.
Immediately executed not when taking out from the reception buffer, but when received 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.

See Appendix 2 Automatic Status for details regarding ASB status.

ENQ

[Name] Real-time printer status (1)

[Code]		
	ASCII	ENQ
	Hexadecimal	05
	Decimal	5

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] This command is effective only when using an interface capable of bi-directional data communications.
When this command is received, the printer sends one byte of ENQ status to the host in real time.
Immediately executed not when taking out from the reception buffer, but when received 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.

See Appendix 2 ENQ Command Status for details regarding status.

EOT

[Name] Real-time printer status (2)

[Code]

ASCII	EOT
Hexadecimal	04
Decimal	4

[Defined Area]	Thermal	: -
	Slip	: -
	Validation	: -
[Initial Value]	Thermal	: -
	Slip	: -
	Validation	: -

[Function] This command is effective only when using an interface capable of bi-directional data communications.
When this command is received, the printer sends one byte of EOT status to the host in real time. Immediately executed not when taking out from the reception buffer, but when received 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.

See Appendix 2 EOT Command Status for details regarding status.

ETB

[Name] Update of ETB status of ASB

[Code]

ASCII	ETB
Hexadecimal	17
Decimal	23

[Defined Area]	Thermal	: -
	Slip	: -
	Validation	: -
[Initial Value]	Thermal	: -
	Slip	: -
	Validation	: -

[Function] This command is effective only when using an interface capable of bi-directional data communications.
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 2 for details regarding the ASB 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]
Thermal : n = 0, 48 (“0”)
Slip : n = 0, 48 (“0”)
Validation : n = 0, 48 (“0”)

[Initial Value]
Thermal : ASB ETB counter = 0
Slip : ASB ETB counter = 0
Validation : ASB ETB counter = 0

[Function]

Clears the ASB ETB counter to zero and clears the ETB status.
However, when clearing the ETB counter to zero using this command, ASB status is not transmitted.
The ETB counter and ETB status are initialized by the following command in addition to this command.

- Cancel print data and initialize commands <CAN>

3-3-15) Kanji Characters

ESC p

[Name] Specify JIS Kanji character mode

[Code]

ASCII	ESC	p
Hexadecimal	1B	70
Decimal	27	112

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : Cancel JIS Kanji character mode
Slip : Cancel JIS Kanji character mode
Validation : Cancel JIS Kanji character mode

[Function]
Specifies JIS Kanji character mode
When in JIS Kanji character mode, all character codes are handled as 2 byte Japanese 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 and Kanji characters and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

<Slip>, <Validation>
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

ESC q

[Name] Cancel JIS Kanji character mode

[Code]

ASCII	ESC	q
Hexadecimal	1B	71
Decimal	27	113

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : Cancel JIS Kanji character mode
Slip : Cancel JIS Kanji character mode
Validation : Cancel JIS Kanji character mode

[Function]
Cancels JIS Kanji character mode.
This command is ignored for models not equipped with Japanese and Kanji characters and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

<Slip>, <Validation>
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

ESC $ n

[Name] Specify/cancel JIS Kanji character mode

[Code]

ASCII	ESC	$	n
Hexadecimal	1B	24	n
Decimal	27	36	n

[Defined Area]
Thermal : n = 0, 1, 48, 49
Slip : n = 0, 1, 48, 49
Validation : n = 0, 1, 48, 49

[Initial Value]
Thermal : Memory switch setting
Slip : Memory switch setting
Validation : Memory switch setting

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

n	Shift JIS Japanese Character Mode
0, 48	Cancel shift JIS Kanji character mode
1, 49	Specify shift JIS Kanji character mode

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

When the lower code is <7F>, <FD> to <FF>h, two bytes are ignored.

<Slip>, <Validation>
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

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]

Thermal : 0 ≦ n1 ≦ 7, 48 ≦ n1 ≦ 55 (“0” ≦ n1 ≦ “7”)
0 ≦ n2 ≦ 15, 48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”)

Slip : 0 ≦ n1 ≦ 7, 48 ≦ n1 ≦ 55 (“0” ≦ n1 ≦ “7”)
0 ≦ n2 ≦ 15, 48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”)

Validation : 0 ≦ n1 ≦ 7, 48 ≦ n1 ≦ 55 (“0” ≦ n1 ≦ “7”)
0 ≦ n2 ≦ 15, 48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”)

[Initial Value]

Thermal : Memory switch setting
Slip : Memory switch setting
Validation : Memory switch setting

[Function] Adds n1 dot left space and n2 dot right space to Kanji characters.
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.

<Slip>, <Validation>

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 the n1 and n2 values for double high/double wide 16 x 16 characters.
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.
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

ESC t n1 n2

[Name] Set single-byte Kanji characters left/right spaces

[Code]					
	ASCII	ESC	t	n1	n2
	Hexadecimal	1B	74	n1	n2
	Decimal	27	116	n1	n2

[Defined Area]

Thermal : 0 ≦ n1 ≦ 7, 48 ≦ n1 ≦ 55 (“0” ≦ n1 ≦ “7”)
0 ≦ n2 ≦ 15, 48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”)

Slip : 0 ≦ n1 ≦ 7, 48 ≦ n1 ≦ 55 (“0” ≦ n1 ≦ “7”)
0 ≦ n2 ≦ 15, 48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”)

Validation : 0 ≦ n1 ≦ 7, 48 ≦ n1 ≦ 55 (“0” ≦ n1 ≦ “7”)
0 ≦ n2 ≦ 15, 48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”)

[Initial Value]

Thermal : Memory switch setting
Slip : Memory switch setting
Validation : Memory switch setting

[Function] Adds n1 dot left space and n2 dot right space to single-byte Kanji characters.
See each printer’s product specifications manual for details on the memory switch settings.
This command is ignored for models not equipped with Japanese and Kanji characters and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch.

<Slip>, <Validation>

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 the n1 and n2 values for double high/double wide 16 x 16 characters.
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.
When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

(Note) The settings by this command are valid for all stations.

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]

Thermal : 0 ≦ d ≦ 255

k = 72, c1 and c2 differ according to specifications and code type (see table below).

Slip : 0 ≦ d ≦ 255

k = 32, c1 and c2 differ according to specifications and code type (see table below).

Validation : 0 ≦ d ≦ 255

k = 32, c1 and c2 differ according to specifications and code type (see table below).

[Initial Value]

Thermal : All spaces

Slip : All spaces

Validation : All spaces

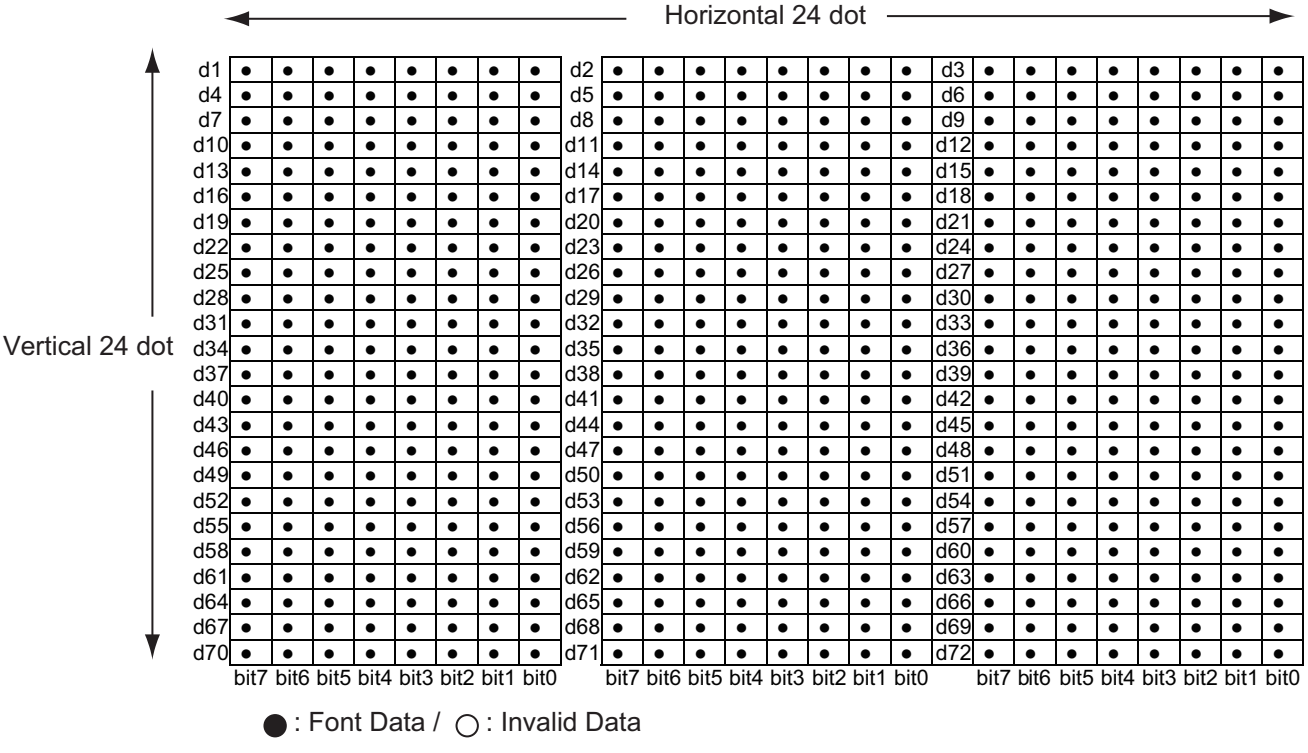
[Function] Registers Chinese download characters to c1 and c2 addresses. Those already registered to these addresses are overwritten.
If c1 and c2 are outside of the defined are or the printer is model not equipped with Chinese fonts (for overseas) and when the specification for the location of use is specified as SBCS (single byte countries) by the memory switch, the printer discards up to d1 and dk.
Chinese download characters once defined are valid until redefined or the power is turned OFF.
Defined Chinese 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.

<Thermal>

The defined ranges are shown below. (* The registration region is the same for Japanese characters in JIS or shift JIS.)

Specifications	c1	c2	Registration count
Japanese characters/JIS type	c1 = 77h	21h ≦ c2 ≦ 7Eh	94 Characters
Japanese characters/Shift JIS type	c1 = ECh	40h ≦ c2 ≦ 7Eh 80h ≦ c2 ≦ 9Eh	94 Characters

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

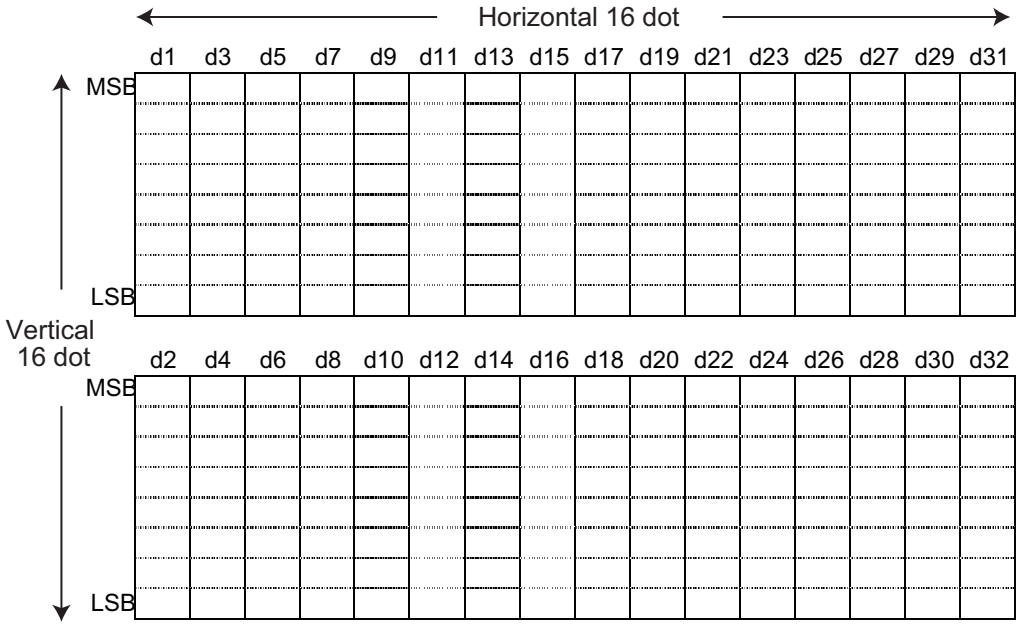


● : Font Data / ○ : Invalid Data

<Slip>, <Validation>
The defined ranges are shown below.

Specifications	c1	c2	Registration count
Japanese Language Kanji characters	c1 = 77h	21h ≦ c2 ≦ 7Eh	94 Characters

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



The font of Kanji 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.”

When page mode is selected, only registration is possible.
Printing is possible after switching to line mode.
Registered data is shared by slip and validation.

ESC u n

[Name] Specify two-byte 16 x 16 dot Kanji character (Single density/double density)

[Code]

ASCII	ESC	u	n
Hexadecimal	1B	75	n
Decimal	27	117	n

[Defined Area]
Thermal : -
Slip : n = 0, 1, n = 48, 49 (“0,” “1”)
Validation : n = 0, 1, n = 48, 49 (“0,” “1”)

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

[Function]

<Thermal>

Only setting is valid
Setting is valid after switching to slip or validation.

<Slip>, <Validation>

Specifies two-byte 16 x 16 dot Kanji character (Single density/double density) (* : See “Relationship of Japanese Character Size Selection.”

n	State Transition
0, 48	Specify two-byte 16 x 16 dot [double density] Japanese characters When two-bytes is selected, they become four-pass characters (state (A) to state (B)) Dots continuous horizontally are printing. Sets to the 4 x expanded character mode by combining with ESC x 0 (Specify expanded Japanese characters) (state (A) → state (D))
1, 49	Specify two-byte 16 x 16 dot Kanji characters (single density). When two-bytes is selected, they become two-pass characters (state (B) to state (A)) Dots continuous horizontally are thinned for printing. Sets to the vertical expanded character mode by combining with ESC x 0 (Specify expanded Kanji characters) (state (B) → state (C))

When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

ESC x n

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

[Code]

ASCII	ESC	x	n
Hexadecimal	1B	78	n
Decimal	27	120	n

[Defined Area]
Thermal : -
Slip : n = 0, 1, n = 48, 49 (“0,” “1”)
Validation : n = 0, 1, n = 48, 49 (“0,” “1”)

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

[Function]

<Thermal>

Only setting is valid
Setting is valid after switching to slip or validation.

<Slip>, <Validation>

Sets (double tall/double high and wide) Kanji character expansion. (* : See “Relationship of Japanese Character Size Selection.”

n	State Transition
0, 48	Sets Kanji character expansion. When 16 x 16 dot Kanji characters [single density] are selected, they expand only in the vertical direction. [Vertical tall size: State (A) to state (C)] When 16 x 16 dot Kanji characters [double density] are selected, they expand both vertically and horizontally. [Double high and wide size: State (B) to state (D)]
1, 49	Cancels specify Kanji character expansion, and sets to two-byte Kanji characters When 16 x 16 dot Kanji characters [double 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))

When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

ESC w n

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

[Code]

ASCII	ESC	w	n
Hexadecimal	1B	77	n
Decimal	27	119	n

[Defined Area]
Thermal : -
Slip : n = 0, 1, n = 48, 49 (“0,” “1”)
Validation : n = 0, 1, n = 48, 49 (“0,” “1”)

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

[Function]

<Thermal>

Only setting is valid
Setting is valid after switching to slip or validation.

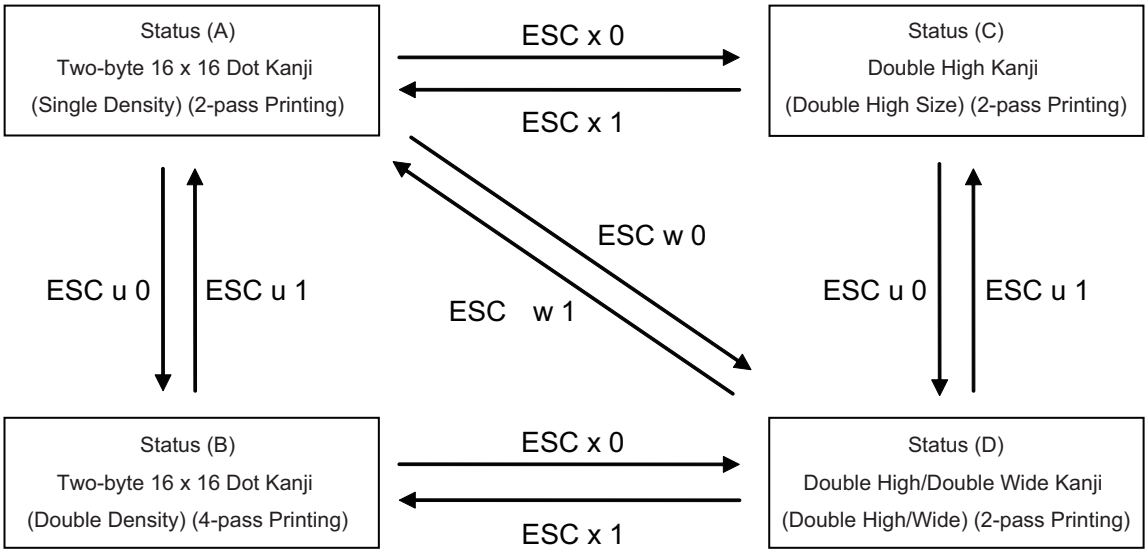
<Slip>, <Validation>

Sets (batch double tall/double high and wide) Kanji character expansion. (* : See “Relationship of Japanese Character Size Selection.”

n	State Transition
0, 48	Sets double high & wide (double-wide/double-high) 16 x 16 Japanese characters. (to state (D))
1, 49	Cancels specify Japanese character expansion, and sets to two-byte 16 x 16 dot Japanese characters [single density] Japanese characters become two-pass characters (to state (A))

When page mode is selected, only setting is valid
Setting is valid after switching to line mode.

<Relationship of Kanji 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 Japanese characters. This section use a Japanese character to illustrate the difference.

3-3-16) Others

RS

[Name] Ring buzzer

[Code] ASCII RS
Hexadecimal 1E
Decimal 30

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function] Issues a short buzzer sound from the printer.
Execute this command after printing the unprinted data in the line buffer.

CAN

[Name] Cancel print data and initialize commands

[Code] ASCII CAN
Hexadecimal 18
Decimal 24

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[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 re-loading is not performed.
After execution, thermal is selected.

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

- Set print density
- Set print speed
- Two Color Printing Mode Setting
- Printing color in 2-color printing mode
- External device drive condition
- Auto status valid/invalid conditions

ESC @

[Name] Command initialization

[Code]

ASCII	ESC	@
Hexadecimal	1B	40
Decimal	27	64

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function] Initializes each command after printing data in the line buffer.
However, printers with memory switch settings are initialized to the memory switch settings.
DIPSW re-loading is not performed.
After execution, thermal is selected.

<Shared>

- ANK characters, Kanji character adornment, expansion
- Kanji character mode
- ANK right space
- Kanji character right and left spaces
- Character pitch
- International characters
- Code pages
- Set slash zero
- Set specify/cancel external character (external register character data is retained)
- Line feed amount
- Set upside-down, position alignment
- Right/left margins
- Horizontal tab

<Thermal>

- Page length
- Current position (move to top of page, top of line)
- Vertical tab

<Slip>, <Validation>

- Paper discharge

<Other Information>

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

- Set print density
- Set print speed
- Two Color Printing Mode Setting
- Printing color in 2-color printing mode
- External device drive condition
- Auto status valid/invalid conditions

ESC U n

[Name] Select printing direction

[Code]

ASCII	ESC	U	n
Hexadecimal	1B	55	n
Decimal	27	85	n

[Defined Area]
Thermal : -
Slip : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)
Validation : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)

[Initial Value]
Thermal : -
Slip : n = 0
Validation : n = 0

[Function]

<Thermal>

Only setting is valid
Setting is valid after switching to slip or validation.

<Slip>, <Validation>

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

n	State Transition
0, 48	Specify bi-directional printing
1, 49	Specify uni-directional printing

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.
The printing direction can be set independently for both line mode and page mode.
Setting values are shared for slip, and validation line mode and page mode is selected.

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

[Defined Area]

Thermal :
m = 87, 84, 44, 43, 45, 64, 75, 76 (m = “W”, “T”, “,”, “+”, “-”, “@”, “K”, “L”)
48 ≦ n1 ≦ 57 (”0” ≦ n1 ≦ “9”), 65 ≦ n1 ≦ 70 (”A” ≦ n1 ≦ “F”), 97 ≦ n1 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”), 97 ≦ n2 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n3 ≦ 57 (”0” ≦ n3 ≦ “9”), 65 ≦ n3 ≦ 70 (”A” ≦ n3 ≦ “F”), 97 ≦ n3 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n4 ≦ 57 (”0” ≦ n4 ≦ “9”), 65 ≦ n4 ≦ 70 (”A” ≦ n4 ≦ “F”), 97 ≦ n4 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ N ≦ 57 (”0” ≦ N ≦ “9”), 65 ≦ N ≦ 72 (”A” ≦ N ≦ “F”), 97 ≦ N ≦ 104 (“a” ≦ N ≦ “h”)
N = 85 (U) User defined region

Slip :
m = 87, 84, 44, 43, 45, 64, 75, 76 (m = “W”, “T”, “,”, “+”, “-”, “@”, “K”, “L”)
48 ≦ n1 ≦ 57 (”0” ≦ n1 ≦ “9”), 65 ≦ n1 ≦ 70 (”A” ≦ n1 ≦ “F”), 97 ≦ n1 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”), 97 ≦ n2 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n3 ≦ 57 (”0” ≦ n3 ≦ “9”), 65 ≦ n3 ≦ 70 (”A” ≦ n3 ≦ “F”), 97 ≦ n3 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n4 ≦ 57 (”0” ≦ n4 ≦ “9”), 65 ≦ n4 ≦ 70 (”A” ≦ n4 ≦ “F”), 97 ≦ n4 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ N ≦ 57 (”0” ≦ N ≦ “9”), 65 ≦ N ≦ 72 (”A” ≦ N ≦ “F”), 97 ≦ N ≦ 104 (“a” ≦ N ≦ “h”)
N = 85 (U) User defined region

Validation :
m = 87, 84, 44, 43, 45, 64, 75, 76 (m = “W”, “T”, “,”, “+”, “-”, “@”, “K”, “L”)
48 ≦ n1 ≦ 57 (”0” ≦ n1 ≦ “9”), 65 ≦ n1 ≦ 70 (”A” ≦ n1 ≦ “F”), 97 ≦ n1 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n2 ≦ 57 (”0” ≦ n2 ≦ “9”), 65 ≦ n2 ≦ 70 (”A” ≦ n2 ≦ “F”), 97 ≦ n2 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n3 ≦ 57 (”0” ≦ n3 ≦ “9”), 65 ≦ n3 ≦ 70 (”A” ≦ n3 ≦ “F”), 97 ≦ n3 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ n4 ≦ 57 (”0” ≦ n4 ≦ “9”), 65 ≦ n4 ≦ 70 (”A” ≦ n4 ≦ “F”), 97 ≦ n4 ≦ 102 (“a” ≦ n1 ≦ “f”)
48 ≦ N ≦ 57 (”0” ≦ N ≦ “9”), 65 ≦ N ≦ 72 (”A” ≦ N ≦ “F”), 97 ≦ N ≦ 104 (“a” ≦ N ≦ “h”)
N = 85 (U) User defined region

[Initial Value]

Thermal : -
Slip : -
Validation : -

[Function] Sends command to write after defining memory switch using the definition command specified by the following classes.
Memory switch information defined by the command to write is written to the volatile memory.
When writing to the volatile memory by the command to write, the printer executes a reset.
By specifying N = 85 (“U”), it is possible to register any 16 bit data.

Function	Class	m	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”
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
Data Definition (initialize all data)	Definition	“@”	Fixed at “0”	Fixed at “0000”
Definition data write, reset, test print, and dot adjustment				
Definition data write, dot adjustment, test print, and reset				

- m : Mode Selection
- N : Memory switch number to specify
- n1 n2 n3 n4 : Specified data m = “+” → Specified Data
  m = “+” → Bit number to set
  m = “+” → Bit number to clear

<Thermal>

When a function was specified that accompanies position adjustment (m = “K,” “L”), this executes only defined data write & reset, but does not execute the position adjustment.

<Validation>

When a function was specified that accompanies a self-print, and position adjustment (m = “T,” “K,” “L”), this executes only defined data write & reset, but does not execute the self-print or position adjustment.

ESC # @ LF NUL

[Name] Initialize all memory switches

[Code]	ASCII	ESC	#	@	LF	NUL
	Hexadecimal	1B	23	40	0A	00
	Decimal	27	35	64	10	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Initializes all memory switches
Valid when power turned on again, or a reset is applied

ESC # N ? n1 n2 n3 n4 LF NUL

[Name] Enquire memory switch settings

[Code]	ASCII	ESC	#	N	?	n1	n2	n3	n4	LF	
	Hexadecimal	1B	23	N	3F	n1	n2	n3	n4	0A	00
	Decimal	27	35	N	63	n1	n2	n3	n4	10	0

[Defined Area]	Thermal	:	n1 = 48 (“0”), n2 = 48 (“0”), n3 = 48 (“0”), n4 = 48 (“0”) 48 ≦ N ≦ 57 (”0” ≦ N ≦ “9”), 65 ≦ N ≦ 72 (”A” ≦ N ≦ “F”), 97 ≦ N ≦ 104 (“a” ≦ N ≦ “h”) N = 85 (U) User defined region
	Slip	:	n1 = 48 (“0”), n2 = 48 (“0”), n3 = 48 (“0”), n4 = 48 (“0”) 48 ≦ N ≦ 57 (”0” ≦ N ≦ “9”), 65 ≦ N ≦ 72 (”A” ≦ N ≦ “H”), 97 ≦ N ≦ 104 (“a” ≦ N ≦ “h”) N = 85 (U) User defined region
	Validation	:	n1 = 48 (“0”), n2 = 48 (“0”), n3 = 48 (“0”), n4 = 48 (“0”) 48 ≦ N ≦ 57 (”0” ≦ N ≦ “9”), 65 ≦ N ≦ 72 (”A” ≦ N ≦ “H”), 97 ≦ N ≦ 104 (“a” ≦ N ≦ “h”) N = 85 (U) User defined region
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Sends the memory switch settings.
By specifying N = 85 (“U”), it is possible to read out any user-registered 16 bit data.
• N: Memory Switch Number
Transmission Format
ESC # N ? d1 d2 d3 d4 LF NUL
• N: Memory number
• d1, d2, d3, d4: Memory switch settings

ESC # * LF NUL

[Name] Inquire printer version

[Code]	ASCII	ESC	#	*	LF	NUL
	Hexadecimal	1B	23	2A	0A	00
	Decimal	27	35	42	10	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

Sends printer version.
ESC # *, printer version LF NUL
< Ex: For HSP7000 Ver. 1.0 ESC # *, HSP7000 Ver. 1.0 LF NUL >

ESC ? LF NUL

[Name] Reset printer (execute self print)

[Code]	ASCII	ESC	?	LF	NUL
	Hexadecimal	1B	3F	0A	00
	Decimal	27	63	10	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[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).
When resetting the printer, the following processes are performed.

I/F	Mode	Process
Parallel	---	BUSY output
RS-232C	DTR mode	DTR mark output
	Xon/Xoff Mode	Xoff output

<Validation> Executes only a reset; does not execute a self-print.

DC3

[Name] Printer deselect

[Code] ASCII DC3
Hexadecimal 13
Decimal 19

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : Select printer
Slip : Select printer
Validation : 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] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : Select printer
Slip : Select printer
Validation : Select printer

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

3-4) Raster Graphics Command Details

Raster graphics are command types and incidental specifications that enable high speed and high quality printing of graphics.
The following shows the characteristics and specifications for raster graphics.

- Define the raster mode command as an expansion set for Star Line mode.
  Basically no restrictions set for use of conventional STAR line mode.
  Not usable with Star Page mode.
- Supports high-speed data transmission
  When using IEEE 1284, data transmission rate of 80 to 100 kbytes ensured.
- Supports both fixed lengths and variable length modes.
- Print speed selectable
- Post printing cut operation selectable
- All settings possible by raster commands.
  Most settings are possible without DIPSW/memory switch settings.
- Support of printer driver that supports the raster mode.

The following shows the raster command details.
Note that if not specifically noted, the following commands are effective only in raster mode and the commands are ignored (Four bytes ignored) when other than the raster mode.
The raster image buffer in the command details described below indicate the raster dedicated image buffer, the length thereof (vertical direction dot count) differing between models.

The following commands are valid only when thermal has been selected. Their use is prohibited when slip and validation have been selected.

The following commands are valid only when Thermal is selected. Use is prohibited when Slip/Validation is selected.

ESC * r R

[Name] Initialize raster mode

[Code]					
ASCII	ESC	*	r	R
Hexadecimal	1B	2A	72	52
Decimal	27	42	114	82

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Initializes raster mode.
This command is also valid when not in the raster mode.
However, initialization of the raster mode with this command is executed when entering the raster mode.
The following settings are initialized using this command.

- Raster page length setting (ESC * r P n NUL)
- Raster print quality setting (ESC * Q n NUL)
- Raster print quality setting (ESC * r K n NUL)
- Raster left margin setting (ESC * r m l n NUL)
- Raster right margin setting (ESC * r m r n NUL)
- Raster EOT mode setting (ESC FF EOT)
- Raster FF mode setting (ESC FF NUL)
- Clear raster image buffer

Note that when entering the raster mode, it executes the same process as initialization of the raster mode using this command.

However, because initialization is not performed when entering the raster mode only for the following settings, when initializing the following it sends this initialization command.

- Raster print quality setting (ESC * r K n NUL)

<Slip>, <Validation>

Use prohibited.

ESC * r A

[Name] Enter raster mode

[Code]					
	ASCII	ESC	*	r	A
	Hexadecimal	1B	2A	72	41
	Decimal	27	42	114	65

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Enters raster mode.
This command is ignored when in the raster mode.
The following shows the details regard processing of this command.

(1) Reception of this command.
(2) All data remaining in the reception buffer and image buffer is printed equivalent to the FF command.
(3) Initialize raster mode
(4) Enter raster mode

When entering raster mode, raster mode is initialized.
The following shows the contents of the initialization.

- Raster page length setting (ESC * r P n NUL)
- Raster print quality setting (ESC * Q n NUL)
- Raster left margin setting (ESC * r m l n NUL)
- Raster right margin setting (ESC * r m r n NUL)
- Raster EOT mode setting (ESC FF EOT)
- Raster FF mode setting (ESC FF NUL)
- Clear raster image buffer

(*) Not initialized when raster mode is entered only when using raster data print color settings.

<Slip>, <Validation>

Use prohibited.

ESC * r B

[Name] Quit raster mode

[Code]					
ASCII	ESC	*	r	B
Hexadecimal	1B	2A	72	42
Decimal	27	42	114	66

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Quits raster mode.
When raster mode is quit, and raster data remains in the raster mode image buffer, the raster mode will be quit after executing raster EOT mode.

<Slip>, <Validation>

Use prohibited.

ESC * r C

[Name] Clear raster data

[Code]					
ASCII	ESC	*	r	C
Hexadecimal	1B	2A	72	43
Decimal	27	42	114	67

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Clears the image buffer data of the raster mode.

<Slip>, <Validation>

Use prohibited.

ESC * r D n NUL

[Name] Drawer drive

[Code]							
	ASCII	ESC	*	r	D	n	NUL
	Hexadecimal	1B	2A	72	44	n	00
	Decimal	27	42	114	68	n	0

[Defined Area]	Thermal	:	0 ≦ n ≦ 3
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Drives the drawer in the raster mode.
Drawer drive conditions conform to line mode setting command ESC BEL n1 n2.
n is a decimal description (max. 255 digits) using ASCII characters.

n	Drive circuits
0	None
1	External device drive 1 drive
2	External device drive 2 drive
3	External device drive 1 drive and external device drive 2 drive

<Slip>, <Validation>

Use prohibited.

ESC * r E n NUL

[Name] Set raster EOT mode

[Code]							
	ASCII	ESC	*	r	E	n	NUL
	Hexadecimal	1B	2A	72	45	n	00
	Decimal	27	42	114	69	n	0

[Defined Area] Thermal : n = 0, 1, 2, 3, 8, 9, 12, 13
Slip : -
Validation : -

[Initial Value] Thermal : n = 13
Slip : -
Validation : -

[Function]
<Thermal>

Set raster EOT mode
The EOT mode operates to execute using the raster document quit command ESC FF EOT.
n is a decimal description (max. 255 digits) using ASCII characters.

EOT mode setting format

n	Form Feed	Cut Feed	Cutter
0	Set To Default	Set To Default	Set To Default
1	○ (*1)	--	--
2	○ (*1)	○	--
3	○ (*1)	Tear Bar	--
8	○ (*1)	--	Full Cut
9	○ (*1)	○	Full Cut
12	○ (*1)	--	Partial Cut
13	○ (*1)	○	Partial Cut

(*1) Form Feed
When the printer is a model handling BM and is set for BM to be effective, the set raster mode page length is ignored and BM detecting is performed.

<Slip>, <Validation>

Use prohibited.

ESC * r F n NUL

[Name] Set raster FF mode

[Code]							
	ASCII	ESC	*	r	F	n	NUL
	Hexadecimal	1B	2A	72	46	n	00
	Decimal	27	42	114	70	n	0

[Defined Area]	Thermal	:	n = 0, 1, 2, 3, 8, 9, 12, 13
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 13
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets raster FF mode.
The FF mode operates to execute using the raster document quit command ESC FF NUL.
n is a decimal description (max. 255 digits) using ASCII characters.

FF mode setting format

n	Form Feed	Cut Feed	Cutter
0	Set To Default	Set To Default	Set To Default
1	○ (*1)	--	--
2	○ (*1)	○	--
3	○ (*1)	Tear Bar	--
8	○ (*1)	--	Full Cut
9	○ (*1)	○	Full Cut
12	○ (*1)	--	Partial Cut
13	○ (*1)	○	Partial Cut

(*1) Form Feed
When the printer is a model handling BM and is set for BM to be effective, the set raster mode page length is ignored and BM detecting is performed.

<Slip>, <Validation>

Use prohibited.

ESC * r P n NUL

[Name] Set raster page length

[Code]							
	ASCII	ESC	*	r	P	n	NUL
	Hexadecimal	1B	2A	72	50	n	00
	Decimal	27	42	114	80	n	0

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : Raster image buffer length
Slip : -
Validation : -

[Function]
<Thermal>

Sets raster page length.
n is a decimal description (max. 255 digits) using ASCII characters.

n	Page length
0	Continuous print mode (no page length setting)
1 ≦ n	Specify page length

<Slip>, <Validation>

Use prohibited.

ESC * r Q n NUL

[Name] Set raster print quality

[Code]							
	ASCII	ESC	*	r	Q	n	NUL
	Hexadecimal	1B	2A	72	51	n	00
	Decimal	27	42	114	81	n	0

[Defined Area] Thermal : 0 ≦ n ≦ 2
Slip : -
Validation : -

[Initial Value] Thermal : n = 0
Slip : -
Validation : -

[Function]
<Thermal>

Sets raster print quality.
n is a decimal description (max. 255 digits) using ASCII characters.

n	• Print quality
0	Specify high speed printing
1	Normal print quality
2	High print quality

<Slip>, <Validation>

Use prohibited.

ESC * r m l n NUL

[Name] Set raster left margin

[Code]	ASCII	ESC	*	r	m	l	n	NUL
	Hexadecimal	1B	2A	72	6D	6C	n	00
	Decimal	27	42	114	109	108	n	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Sets raster left margin.
This command sets the left margin to (n x 8) dots.
When the left margin exceeds the printable area, or if the left margin specification eliminates the print area ((printable region - right margin) ≧ left margin specified value), this command is ignored.
n is a decimal description (max. 255 digits) using ASCII characters.

<Slip>, <Validation>

Use prohibited.

ESC * r m r n NUL

[Name] Set raster right margin

[Code]	ASCII	ESC	*	r	m	r	n	NUL
	Hexadecimal	1B	2A	72	6D	72	n	00
	Decimal	27	42	114	109	114	n	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Sets raster right margin.
This command sets the right margin to (n x 8) dots.
When the right margin exceeds the printable area, or if the right margin specification eliminates the print area ((printable region - left margin) ≧ right margin) specified value, this command is ignored.
n is a decimal description (max. 255 digits) using ASCII characters.

<Slip>, <Validation>

Use prohibited.

ESC * r T n NUL

[Name] Set raster top margin

[Code]							
	ASCII	ESC	*	r	T	n	NUL
	Hexadecimal	1B	2A	72	54	n	00
	Decimal	27	42	114	84	n	0

[Defined Area]	Thermal	:	0 ≦ n ≦ 2
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets the raster top margin.
n is a decimal description (max. 255 digits) using ASCII characters.

n	Top margin
0	Set To Default
1	Set top margin using reverse paper feed.
2	Set standard top margin.

(*) This differs according to the model handling this command.

When in the raster mode, the top margin setting of line mode remains.
When quitting the raster mode, continue the top margin setting of the raster mode and return to the line mode.

<Slip>, <Validation>

Use prohibited.

ESC * r K n NUL

[Name] Set raster print color

[Code]

ASCII	ESC	*	r	K	n	NUL
Hexadecimal	1B	2A	72	4B	n	00
Decimal	27	42	114	75	n	0

[Defined Area]	Thermal	:	0 ≦ n ≦ 3
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets raster print color.
This command is effective only when specifying the 2 color mode using the line mode.
This command is ignored when not in the 2 color print mode.
n is a decimal description (max. 255 digits) using ASCII characters.

n	Print color
0	Black
1	Cyan
2	Magenta
3	Yellow

(*) This command is valid only when using a model that supports 2-color printing. This command is ignored on non-compatible models.

<Slip>, <Validation>

Use prohibited.

b n1 n2 data

[Name] Send raster data (auto line feed)

[Code]								
ASCII	b	n1	n2	d1	d2	...	dk
Hexadecimal	62	n1	n2	d1	d2	...	dk
Decimal	98	n1	n2	d1	d2	...	dk

[Defined Area]	Thermal	:	0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255, 0 ≦ d ≦ 255 k = n1 + n2 x 256, 1 ≦ k
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sends raster data.
Raster data is sent in (n1 + n2 x 256) byte counts as binary data.
Raster data exceeding the print area currently set is discarded.
The image buffer expanded position is automatically line fed one dot row and moved to the left margin on the next line after expanded the image buffer data 1 dot row using this command.
Also, data expansion is duplicated on the data in the current image buffer (OR process).
The following shows expanded image buffer for the set raster print color.
n is a decimal description (max. 255 digits) using ASCII characters.

Print color	Expanded image buffer
Black	Image buffer for black
Cyan	Image buffer for color
Magenta	Image buffer for color
Yellow	Image buffer for color

<Slip>, <Validation>

Use prohibited.

k n1 n2 data

[Name] Transfer raster data

[Code]

ASCII	k	n1	n2	d1	d2	...	dk
Hexadecimal	6B	n1	n2	d1	d2	...	dk
Decimal	107	n1	n2	d1	d2	...	dk

[Defined Area]
Thermal : 0 ≦ n1 ≦ 255, 0 ≦ n2 ≦ 255, 0 ≦ d ≦ 255
k = n1 + n2 x 256, 1 ≦ k
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Sends raster data.
Raster data is sent in (n1 + n2 x 256) byte counts as binary data.
Raster data exceeding the print area currently set is discarded.
The image buffer expanded position returns to the head of the current dot row without an automatic line fed after expanding the image buffer data 1 dot row using this command.
Also, data expansion is duplicated on the data in the current image buffer (OR process).
The following shows expanded image buffer for the set raster print color.
n is a decimal description (max. 255 digits) using ASCII characters.

Print color	Expanded image buffer
Black	Image buffer for black
Cyan	Image buffer for color
Magenta	Image buffer for color
Yellow	Image buffer for color

<Slip>, <Validation>

Use prohibited.

ESC * r Y n NUL

[Name] Move vertical direction position (Line feed for specified dots)

[Code]							
	ASCII	ESC	*	r	Y	n	NUL
	Hexadecimal	1B	2A	72	59	n	00
	Decimal	27	42	114	89	n	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Moves vertical direction position.
Moves position n dots with this command.
When the current page length setting is in continuous print mode, and n dots exceed the remaining dot count of the raster image buffer length, the data in the print buffer is printed, and paper is fed n dots when this command is received.
Also, when the page length is set, data in the print buffer is printed, and paper is fed once the set page length when this command is received. The remaining paper feed is performed at the print execution command thereafter.
n is a decimal description (max. 255 digits) using ASCII characters.

<Slip>, <Validation>

Use prohibited.

ESC FF NUL

[Name] Execute FF mode

[Code]				
	ASCII	ESC	FF	NUL
	Hexadecimal	1B	0C	00
	Decimal	27	12	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Executes FF mode.
Executes operation specified by the FF mode setting command ESC * r F n NUL.

<Slip>, <Validation>

Use prohibited.

ESC FF EOT

[Name] Execute EOT mode

[Code]				
	ASCII	ESC	FF	EOT
	Hexadecimal	1B	0C	04
	Decimal	27	12	4

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Executes EOT mode.
Executes operation specified by the EOT mode setting command ESC * r E n NUL.

<Slip>, <Validation>

Use prohibited.

ESC * r N n NUL

[Name] Discard specified byte count of data

[Code]							
	ASCII	ESC	*	r	N	n	NUL
	Hexadecimal	1B	2A	72	4E	n	0
	Decimal	27	42	114	78	n	0

[Defined Area]	Thermal	:	1 ≦ n ≦ 9999
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Discard specified byte count of data

The number of bytes specified by n and later-received data are received and discarded.
n is a decimal description (max. 4 digits) using ASCII characters.
This command is value only when in raster mode.

<Slip>, <Validation>

Use prohibited.

ESC * r V m n NUL

[Name] Execute external buzzer drive

[Code]								
	ASCII	ESC	*	r	V	1	n	NUL
	Hexadecimal	1B	2A	72	56	31	n	0
	Decimal	27	42	114	86	49	n	0

[Defined Area] Thermal : m = 49, 50, 1 ≦ n ≦ 20
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

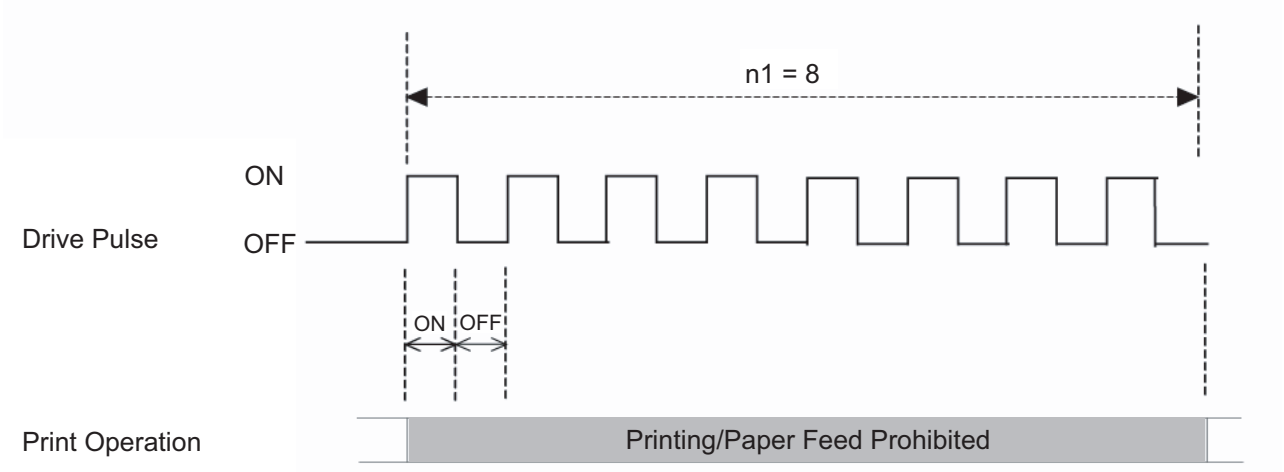
Repeatedly drives the buzzer according to the ON/OFF conditions set by the external buzzer drive pulse condition command ESC GS EM DC1 m n1 n2.

m specifies the buzzer drive terminal to drive.

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

Specifies the number of times to repeat buzzer drive with n.
Buzzer cannot ring while 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 FEED switch or the RELEASE switch while the buzzer is ringing, or opening the receipt cover or the slip cover.
It is necessary to set the conditions prior to entering raster mode using the external buzzer drive pulse conditions command ESC GS EM DC1 m n1 n2.
n is a decimal description (max. 255 digits) using ASCII characters.

[Ex.:]



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

<Slip>, <Validation>

Use prohibited.

3-5) Black Mark Related Command Details

The following commands control top of form functions using black mark paper.
The following commands are effective only when black mark is set to be effective.

ESC d n

[Name] Auto - cutter:

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

[Defined Area]	Thermal	:	0 ≦ n ≦ 3, 48 ≦ n ≦ 51 (“0” ≦ n ≦ “3”)
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

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

n	Auto cutter
0, 48	Full cut at the current position. Print data in line buffer is printed before a full cut. This command is ignored if the printer is not equipped with an auto-cutter.
1, 49	Partial cut at the current position. Print data in line buffer is printed before a partial cut. This command is ignored if the printer is not equipped with an auto-cutter.
2, 50	After executing top of form, paper is fed to cutting position, then a full cut. Print data in line buffer is printed before the operation described above. This command is ignored if the printer is not equipped with an auto-cutter.
3, 51	After executing top of form, paper is fed to cutting position, then a partial cut. Print data in line buffer is printed before the operation described above. This command is ignored if the printer is not equipped with an auto-cutter.

(*) 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 there are for instructions calling for a full cut.

<Slip>, <Validation>

Three bytes ignored

FF

[Name] Execute top of form

[Code]

ASCII	FF	
Hexadecimal	0C	
Decimal	12	

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Executes top of form.

<Slip>, <Validation>

One byte ignored

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]
Thermal : 1 ≦ n ≦ 127
Slip : -
Validation : -

[Initial Value]
Thermal : (Form feed amount initial value x 42)
Slip : -
Validation : -

[Function]

<Thermal>

When black mark is effective, this command is ignored.

<Slip>, <Validation>

Three bytes ignored

ESC C 0 n

[Name] Set page length to n x 24 mm units

[Code]

ASCII	ESC	C	0	n
Hexadecimal	1B	43	0	n
Decimal	27	67	0	n

[Defined Area]
Thermal : 1 ≦ n ≦ 22
Slip : -
Validation : -

[Initial Value]
Thermal : (Form feed amount initial value x 42)
Slip : -
Validation : -

[Function]

<Thermal>

When black mark is effective, this command is ignored.

<Slip>, <Validation>

Four bytes ignored

VT

[Name] Feed paper to vertical tab position

[Code]

ASCII	VT
Hexadecimal	0B
Decimal	11

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

When black mark is effective, this command is ignored.

<Slip>, <Validation>

One byte ignored

ESC B n1 n2 … nk NUL

[Name] Set vertical tab position

[Code]

ASCII	ESC	B	n1	n2	..	nk	NUL
Hexadecimal	1B	42	n1	n2	..	nk	00
Decimal	27	66	n1	n2	..	nk	0

[Defined Area]
Thermal : 1 ≦ n ≦ 255, 0 ≦ k ≦ 16
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

When black mark is effective, this command is ignored.

<Slip>, <Validation>

Received and discarded up to <NUL>.

ESC B NUL

[Name] Clear vertical tab position

[Code]	ASCII	ESC	B	NUL
	Hexadecimal	1B	42	00
	Decimal	27	66	0

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

When black mark is effective, this command is ignored.

<Slip>, <Validation>

Three bytes ignored

3-6) 2-Color Printing Command Details

The following commands control 2-color printing functions.
The following commands are effective only when using a model handling 2-color printing.

ESC RS c n

[Name] Set print color in 2-color print mode

[Code]

ASCII	ESC	RS	c	n
Hexadecimal	1B	1E	63	n
Decimal	27	30	99	n

[Defined Area]
Thermal : 0 ≦ n ≦ 1, 48 ≦ n ≦ 49, (“0” ≦ n ≦ “1”)
Slip : -
Validation : -

[Initial Value]
Thermal : n = 0, 48 (When in 2-color print mode)
Slip : -
Validation : -

[Function]
<Thermal>

Specifies print color in 2 color print mode.
This command is ignored when not in the 2-color print mode.
Specifies black for the print color when in 2-color print mode.
The specification of this command is cleared only when the printer is reset.
The specification of this command is not cleared by ESC @ CAN.
However, print color is initialized to black by the ESC @ and CAN only when in the compatible 2-color print mode.

n	Specifies 2-color print mode color
0, 48	Black
1, 49	Red

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC RS C n

[Name] Select/cancel 2-color print mode

[Code]

ASCII	ESC	RS	C	n
Hexadecimal	1B	1E	43	n
Decimal	27	30	67	n

[Defined Area]
Thermal : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50 (“0” ≦ n ≦ “2”), n = 16, n =32
Slip : -
Validation : -

[Initial Value]
Thermal : n = 0, 48
Slip : -
Validation : -

[Function]
<Thermal>

n	Print Mode Specification
0, 48	Single Color Mode
1, 49	2-color Mode
16	Low-power Consumption Mode
32	Double Resolution Mode

- This command is ignored when the low-power consumption mode is selected by the DIP switches.
- The specification of this command is not cleared by ESC @ CAN.
- Prints data in line buffer, if unprinted data exists in the line buffer.
- This command is processed after quitting the current print.
- Commands that select the same mode are ignored in the currently selected mode.

<Slip>, <Validation>
Only setting is valid
Setting is valid after switching to thermal.

ESC 4

[Name] (Thermal) Specify black/white inversion/(Slip) specify black/white inversion/specify red/black color

[Code]

ASCII	ESC	4
Hexadecimal	1B	34
Decimal	27	52

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	White/black inversion cancelled
	Slip	:	White/black inversion cancelled/black color printing specified
	Validation	:	White/black inversion cancelled/black color printing specified

[Function]

<Thermal>

Specifies white/black inversion for ANK characters and Kanji characters.
IBM block ignores white/black inversion.

<Slip>, <Validation>

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 below, and for details on selecting the red/black substitute function using the memory switch, see the printer specifications manual.

(Note) The settings using this command are valid for all stations and modes.

ESC 5

[Name] (Thermal) Cancel black/white inversion/(Slip) cancel black/white inversion/specify red/black color

[Code]

ASCII	ESC	5
Hexadecimal	1B	35
Decimal	27	53

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	White/black inversion cancelled
	Slip	:	White/black inversion cancelled/black color printing specified
	Validation	:	White/black inversion cancelled/black color printing specified

[Function]

<Thermal>

Cancels white/black inversion for ANK characters and Kanji characters.

<Slip>, <Validation>

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 below, and for details on selecting the red/black substitute function using the memory switch, see the printer specifications manual.

(Note) The settings using this command are valid for all stations and modes.

ESC RS d n

[Name] Set print density

[Code]

ASCII	ESC	RS	d	n
Hexadecimal	1B	1E	64	n
Decimal	27	30	100	n

[Defined Area]
Thermal : 0 ≦ n ≦ 15
48 ≦ n ≦ 57 (“0” ≦ n ≦ “9”), 65 ≦ n ≦ 70 (“A” ≦ n ≦ “F”)
Slip : -
Validation : -

[Initial Value]
Thermal : Memory switch setting
Slip : -
Validation : -

[Function]
<Thermal>

Sets print density.
This command stops printing to be executed.
When in 2-color print mode, this can set the print density of red print.

n	Print Density	
	Single Color Printing Mode	2-color Printing Mode Red Print Density
0, 48	Print density 1.3	Print density 1.2
1, 49	Print density 1.2	Print density 1.2
2, 50	Print density 1.1	Print density 1.0
3, 51	Print density 1.0	Print density 1.0
4, 52	Print density 0.9	Print density 1.0
5, 53	Print density 0.8	Print density 0.8
6, 54	Print density 0.7	Print density 0.8
7, 55	(Reserved)	(Reserved)
8, 56	(Reserved)	(Reserved)
9, 57	(Reserved)	(Reserved)
10, 65	(Reserved)	(Reserved)
11, 66	(Reserved)	(Reserved)
12, 67	(Reserved)	(Reserved)
13, 68	(Reserved)	(Reserved)
14, 69	(Reserved)	(Reserved)
15, 70	(Reserved)	(Reserved)

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC RS r n

[Name] Set printing speed

[Code]

ASCII	ESC	RS	r	n
Hexadecimal	1B	1E	72	n
Decimal	27	30	114	n

[Defined Area]
Thermal : 0 ≦ n ≦ 2, 48 ≦ n ≦ 50, (“0” ≦ n ≦ “2”)
Slip : -
Validation : -

[Initial Value]
Thermal : Memory switch setting
Slip : -
Validation : -

[Function]

<Thermal>

Sets print speed.
This command stops printing to be executed.
Because 2-color print mode prints in one speed, the speed settings with this command are invalid.
This command setting becomes valid when returned from the two-color print mode to the single color print mode.

n	Print Speed	
	Single Color Printing Mode	2-color Printing Mode
0, 48	High speed	2-color Printing Mode Speed
1, 49	Mid-speed	2-color Printing Mode Speed
2, 50	Slow speed	2-color Printing Mode Speed

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

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

[Name]	Register logo																		
[Code]	ASCII	ESC	FS	q	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	.. dk]n
	Hexadecimal	1B	1C	71	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	.. dk]n
	Decimal	27	28	113	n	[x11	x12	y11	y12	d1	..	dk]1	..	[xn1	xn2	yn1	yn2	d1	.. dk]n

[Defined Area]

Thermal :
$1 \leqq n \leqq 255$
$0 \leqq xn1 \leqq 255,\ 0 \leqq xn2 \leqq 3\ \ 1 \leqq (xn1 + xn2 \times 256) \leqq 1023$
$0 \leqq yn1 \leqq 255,\ 0 \leqq yn2 \leqq 1\ \ 1 \leqq (yn1 + yn2 \times 256) \leqq 288$
$0 \leqq d \leqq 255$
$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

Slip :
$1 \leqq n \leqq 255$
$0 \leqq xn1 \leqq 255,\ 0 \leqq xn2 \leqq 3\ \ 1 \leqq (xn1 + xn2 \times 256) \leqq 1023$
$0 \leqq yn1 \leqq 255,\ 0 \leqq yn2 \leqq 1\ \ 1 \leqq (yn1 + yn2 \times 256) \leqq 288$
$0 \leqq d \leqq 255$
$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

Validation :
$1 \leqq n \leqq 255$
$0 \leqq xn1 \leqq 255,\ 0 \leqq xn2 \leqq 3\ \ 1 \leqq (xn1 + xn2 \times 256) \leqq 1023$
$0 \leqq yn1 \leqq 255,\ 0 \leqq yn2 \leqq 1\ \ 1 \leqq (yn1 + yn2 \times 256) \leqq 288$
$0 \leqq d \leqq 255$
$k = \{(xn1 + xn2 \times 256) \times (yn1 + yn2 \times 256) \times 8\}$

[Initial Value]

Thermal : -
Slip : -
Validation : -

[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 data
- k: Logo data count

This command should be specified at the top of the line.
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 re-register 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 aborted.(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 4 Mbits (512 Kbytes = 524,288 bytes).

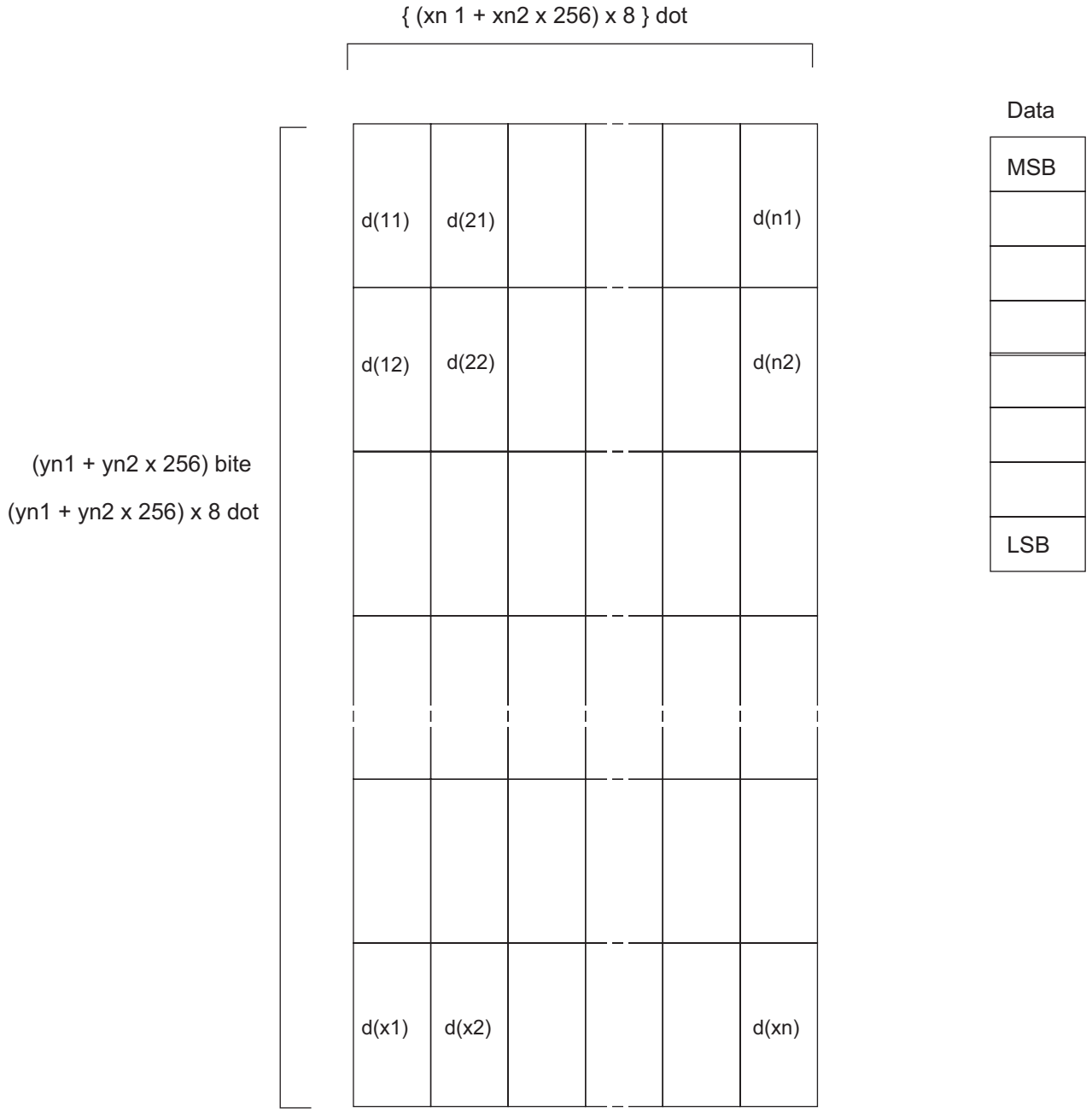
However, 4 Kbytes (4,096 bytes) are kept as parameter information separate to the data so the data region memory capacity is 520,192 Bytes.
Ex.: When the registered data size per each one is 6 Kbytes (6,144 bytes), it is possible to register 520,192/6144 = 84.

<When registering logos for 2 color printing>
Registration is possible regardless of the 2 color printing mode being specified or cancelled. Register logos with the same capacity as the logo register number k (odd number) and k + 1 (even number). If the capacity differs or the logo register number is 255, this command is ignored by the logo print command in the 2 color print mode.

(Note) The registered data is shared by all stations and modes.

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.

Relationship of logo and registered data
xn = xn1 + xn2 x 256, yn = yn1 + yn2 x 256



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]
Thermal : 1 ≦ n ≦ 255
0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”)
Slip : 1 ≦ n ≦ 255
0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”)
Validation : 1 ≦ n ≦ 255
0 ≦ m ≦ 3, 48 ≦ m ≦ 51, (“0” ≦ m ≦ “3”)

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function] Prints the logo of registration number n registered using the logo registration command ESC FS q according to the print mode m.

n: Logo Specification

n	Function
1 to 255	Specified logo number

m: Printing Mode

m	Logo print mode
0, 48	Normal mode
1, 49	Double wide mode
2, 50	Double high mode
3, 51	Double high/wide mode

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.))
It is not possible to print with other data in one line (characters, bit images, bar codes).
Form feed obeys the vertical print size of the logo.
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 horizontal print region, the portion exceeding the area is not printed.
Logos are printed according to 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)
- Relative position movement (ESC GS R n1 n2)
- Horizontal tab (HT)
- Upside-down printing (SI)

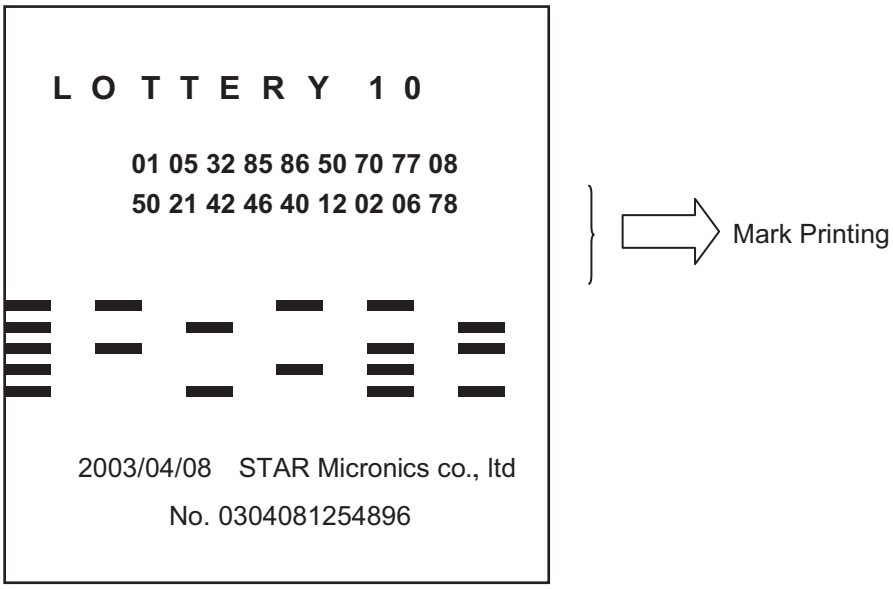
<When using the 2 color print mode>
When the logo register number n is odd:
Register number n is printed in black; register number n + 1 is printed in red and overlapped.
The command is ignored when the capacity of the register number n and the capacity of the register number n + 1 are different.
The command is ignored when the register number n = 255 is specified.
When the logo register number n is even:
Register number n is printed in black; register number n - 1 is printed in red and overlapped.
The command is ignored when the capacity of the register number n and the capacity of the register number n - 1 are different.
The command is ignored when the register number n = 255 is specified.

3-7) Mark Command Details

This command is specialized to mark sheet printing for lotteries. This command can print lines.

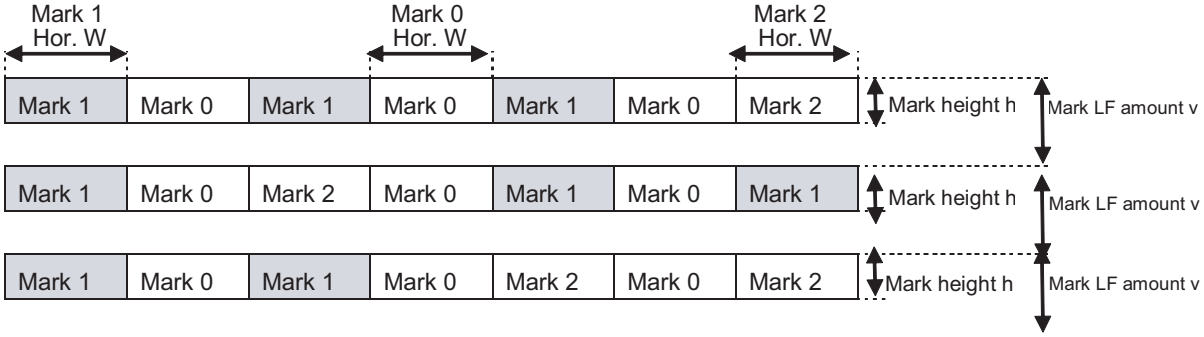
Print Sample

<Print Sample>



Command Transmission Example

- Mark Format
  Mark Height h = 10 dots; Mark Line Feed Amount V = 20 dots
  Mark number 0: Mark Color c = White; Mark Horizontal Width w = 16 dots
  Mark number 1: Mark Color c = Black; Mark Horizontal Width w = 40 dots
  Mark number 2: Mark Color c = White; Mark Horizontal Width w = 40 dots



- Transmission Example
  (1) Mark Height; Line Feed Amount Setting
  <ESC> <GS> * 1 h v (h = “010”, v = “020”)
  (2) Color of Each Mark Number, Horizontal Width Setting
  <ESC> <GS> * 2 m c w (Mark Number 0 Setting: m = “0”, c = “0”, w = “016”)
  <ESC> <GS> * 2 m c w (Mark Number 0 Setting: m = “1”, c = “1”, w = “040”)
  <ESC> <GS> * 2 m c w (Mark Number 0 Setting: m = “2”, c = “0”, w = “040”)
  (3) Register mark format specified by (1) and (2) in advance to the non-volatile memory.
  (It is possible to print a mark without registering in the non-volatile memory.)
  <ESC> <GS> * W
  (4) Mark Printing
  <ESC><GS> * 0 n m1 m2 m3 m4 m5 m6 m7
  (n = “007”, m1 = “1”, m2 = “0”, m3 = “1”, m4 = “0”, m5 = “1”, m6 = “0”, m7 = “2”)
  <ESC><GS> * 0 n m1 m2 m3 m4 m5 m6 m7
  (n = “007”, m1 = “1”, m2 = “0”, m3 = “2”, m4 = “0”, m5 = “1”, m6 = “0”, m7 = “1”)
  <ESC><GS> * 0 n m1 m2 m3 m4 m5 m6 m7
  (n = “007”, m1 = “1”, m2 = “0”, m3 = “1”, m4 = “0”, m5 = “2”, m6 = “0”, m7 = “2”)

ESC GS * 0 n m1 m2 m3 … mk

[Name] Print Mark

[Code]											
	ASCII	ESC	GS	*	0	n	m1	m2	m3	...	mk
	Hexadecimal	1B	1D	2A	30	n	m1	m2	m3	...	mk
	Decimal	27	29	42	48	n	m1	m2	m3	...	mk

[Defined Area]	Thermal	:	“001” ≦ n ≦ “255”, “0” ≦ m ≦ “9”, k = n
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Prints mark number specified by m, based on the pre-specified mark format (mark height, mark line feed amount, mark color, and mark horizontal width).
n indicates the number of marks to print. When there are 10 marks (m1 to m10), n = “010.”
m indicates the mark number to print.
n, m are ASCII character strings that are expressed in decimal. They are composed of character codes from “0” to “9.”
This command is ignored if print data exists in the image buffer.
Therefore, this cannot exist with other print data (characters, bit images, bar codes).
If the specified mark does not fit in the remaining print region, the number of bytes specified by n are received and discarded.
If n is outside of the defined area, data thereafter is processed as normal data.
This command is affected by position alignment, left margin, position movement, position such as horizontal tabs, and upside-down printing.

<Slip>, <Validation>

All data received and discarded.

ESC GS * 1 h v

[Name] Specify mark height and line feed

[Code]

ASCII	ESC	GS	*	1	h	v												
Hexadecimal	1B	1D	2A	31	h	v												
Decimal	27	29	42	49	h	v												

[Defined Area] Thermal : “001” ≦ h ≦ “255”, “001” ≦ v ≦ “255”, h ≦ v
Slip : -
Validation : -

[Initial Value] Thermal : Non-volatile memory
Slip : -
Validation : -

[Function]
<Thermal>

Specifies mark height and line feed
v indicates mark height (number of dots); v indicates mark line feed amount (number of dots).
h, v are ASCII character strings that are expressed in decimal. They are composed of character codes from “0” to “9.”
If a small line feed amount is specified, there is the possibility that intermittent printing could occur, so a setting of v = 16 dots or higher is recommended.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS * 2 m c w

[Name] Specifies mark color and mark horizontal width in each mark number.

[Code]

ASCII	ESC	GS	*	2	m	c	w		
Hexadecimal	1B	1D	2A	32	m	c	w		
Decimal	27	29	42	50	m	c	w		

[Defined Area] Thermal : “0” ≦ m ≦ “9”, “0” ≦ c ≦ ”1”, “001” ≦ w ≦ “999”
Slip : -
Validation : -

[Initial Value] Thermal : Non-volatile memory
Slip : -
Validation : -

[Function]
<Thermal>

Specifies mark color and mark horizontal width in each mark number.
m indicates the mark number.
c indicates the mark color.
w indicates the mark horizontal width (number of dots).
If w exceeds the currently set print region, this command is ignored.
m, c, w are ASCII character strings that are expressed in decimal. They are composed of character codes from “0” to “9.”

c	Mark Color
“0”(48)	White
“1”(49)	Black

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS * W

[Name] Register mark format to non-volatile memory

[Code]					
	ASCII	ESC	GS	*	W
	Hexadecimal	1B	1D	2A	57
	Decimal	27	29	42	87

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Registers the mark format (mark height, mark line feed amount, mark color, and mark horizontal width) in non-volatile memory.
After registration to the non-volatile memory, execute a printer reset.

ESC GS * C

[Name] Initialize mark format in non-volatile memory

[Code]					
	ASCII	ESC	GS	*	C
	Hexadecimal	1B	1D	2A	43
	Decimal	27	29	42	67

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

Initializes the mark format (mark height, mark line feed amount, mark color, and mark horizontal width) registered in non-volatile memory.
After initialization, resets the printer.

Mark Format Initial Value

- Mark Height: “016” (16 dots)
- Mark Line Feed Amount: “032” (32 dots)
- Mark Color: “0” (White → All Mark Numbers)
- Mark Horizontal Width: “080” (80 dots) → All Mark Numbers)

3-8) AUTO LOGO Function Command Details

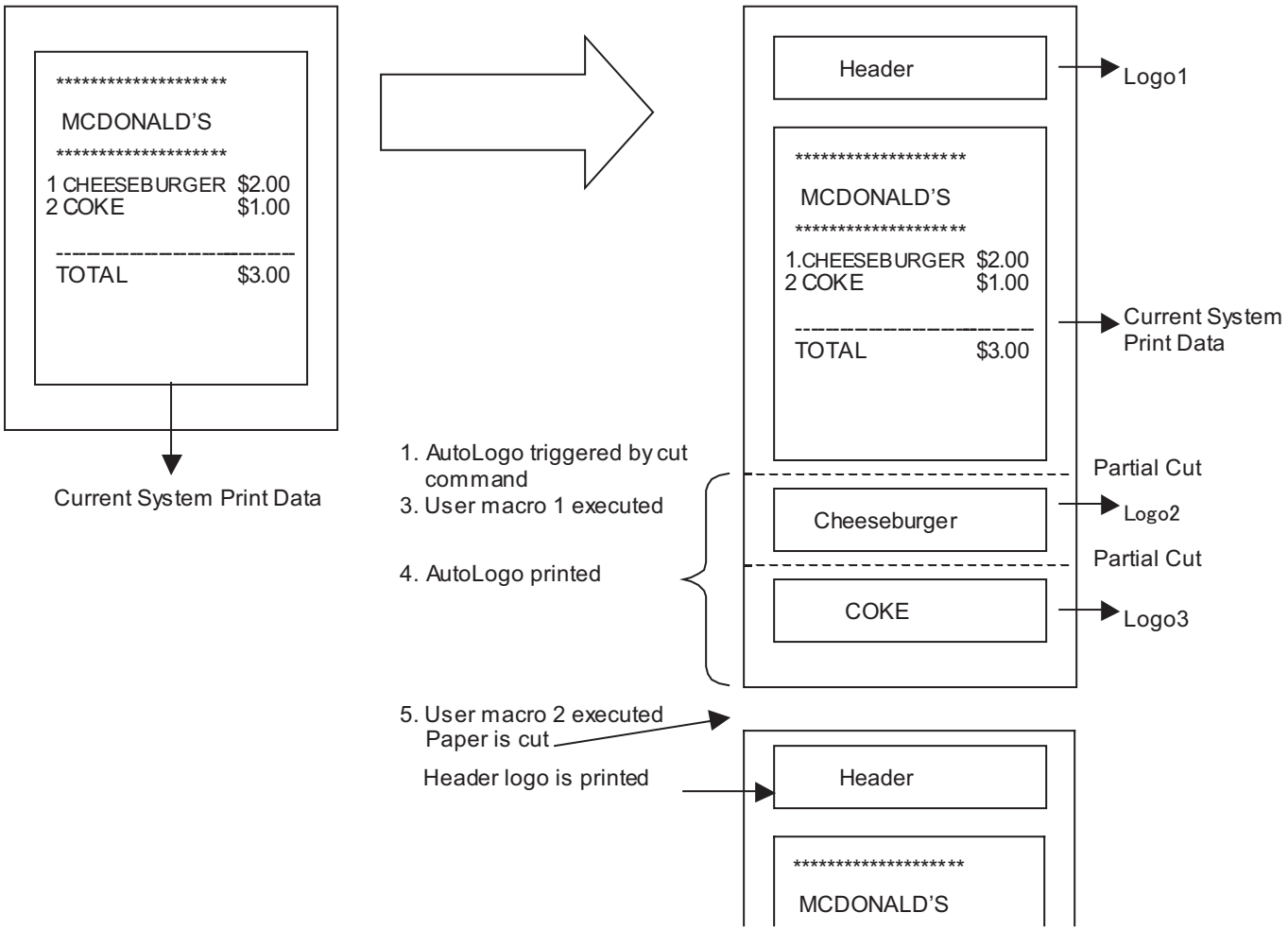
If the portion that was changed was only the product name in a system, like the one below, already operating, this command functions to print a logo like the one below by only changing the product name. This function has two operating modes.

1) Standard Auto Logo Function

Preset the Auto Logo function, and execute the following operations with the printing cut command under the existing system as a trigger.

(1) Auto Logo function starts up using the existing system cut command as a trigger.
(2) Execute printing if print data exists in the image buffer.
(3) Execute user macro 1.
(4) Auto Logo Printing
(5) Execute user macro 2.

By Auto Logo embedding a preset command character "/" and the logo number "2" to print, in the current print data, logo 2 is printed by the (4) Auto Logo Print. In other words, If "CHEESE BURGER / 2" is registered as a product, a coupon for logo 2 will automatically printed for the purchaser of the cheese burger. Also, if logo 1 of the header is used in the company logo, and "cut command + logo 1 print command" are registered in the user macro 2 of (5), the company name of logo 1 will be printed. The user macro 1 of (3) is used when a center alignment of the auto logo is necessary. In such a case, it is necessary to register the left alignment command in the user macro 2 of (5), and to return based on the settings.

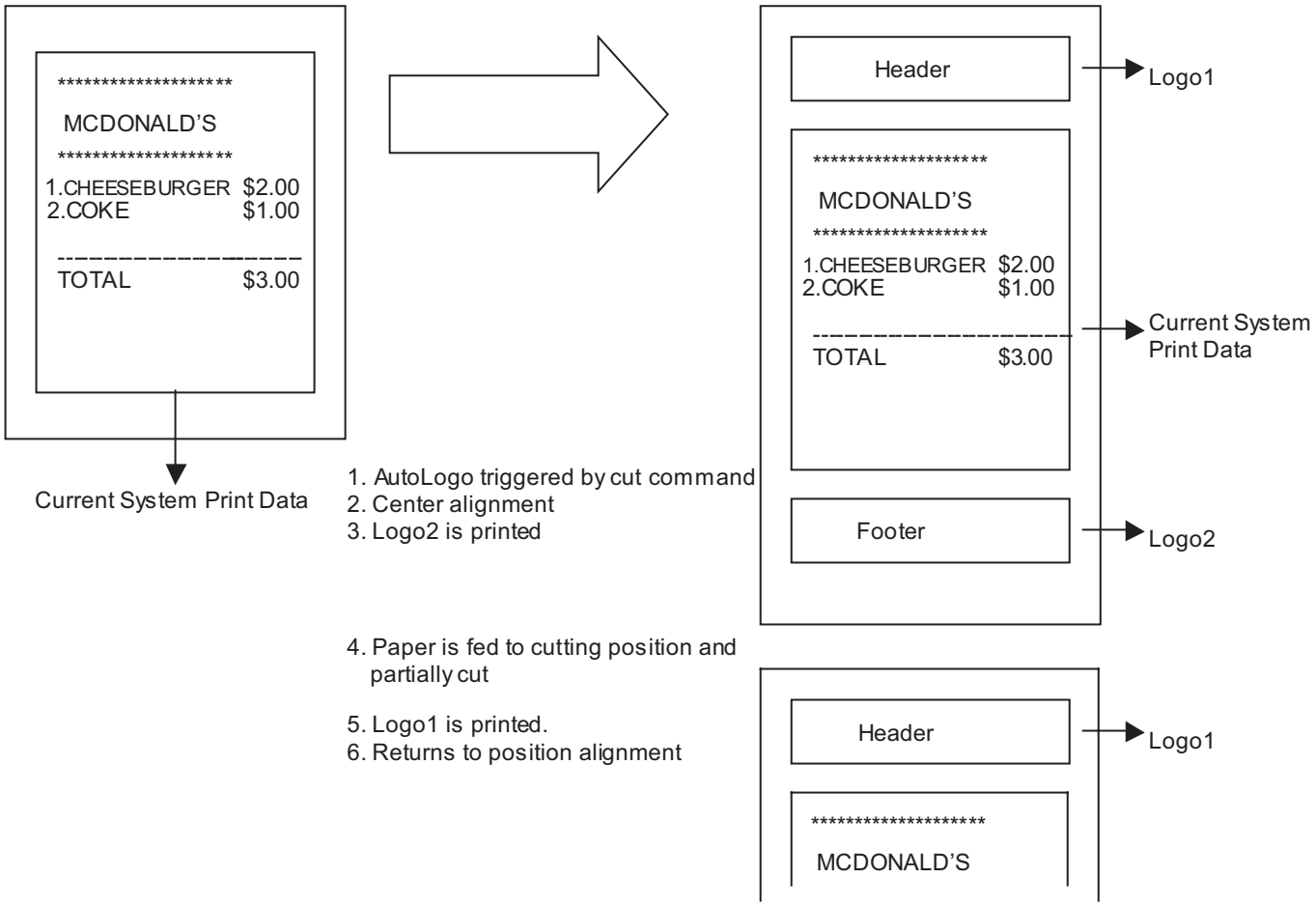


2) Simple Auto Logo Function

Preset the simple Auto Logo function, and execute the following operations with the printing cut command under the existing system as a trigger.

(1) Simple Auto Logo function starts up using the existing system cut command as a trigger.
(2) Center alignment command process
(3) Execute printing of logo 2.
(4) Paper is fed to cutting position, then a partial cut is executed.
(5) Execute printing of logo 1.
(6) Recover position alignment command to setting to before execution of simple Auto Logo

With the simple Auto Logo function the logo number of the logo to print is predetermined.



Command Transmission Example

1) Set the Auto Logo function in advance and register to the non-volatile memory.

ESC GS / 1 n (n = 0x01):	Auto Logo Function ON
ESC GS / 2 n (n = "/"):	Auto Logo Command Character ("/") Specification
ESC GS / 3 nL nH d1 d2 … dk:	User macro 1 definition
nL = 4 nH = 0:	Register macro data count = 4 bytes
d1 = 0x1b d2 = 0x1d d2 = 0x61 d3 = 0x01:	Registration macro <ESC GS a 1: Center alignment>
ESC GS / 4 nL nH d1 d2 … dk:	User macro 2 definition
nL = 12 nH = 0:	Register macro data count = 12 bytes
d1 = 0x1b d2 = 0x64 d3 = 0x03:	Registered macro <ESC d 3: Cut position partial Cut>
d4 = 0x1b d5 = 0x1c d6 = 0x70 d7 = 0x01 d8 = 0x00:	<ESC FS p 1 0 : Logo 1 print>
d9 = 0x1b d10 = 0x1d d11 = 0x61 d12 = 0x00:	<ESC GS a 0: Left alignment>
ESC GS / 5 n (n = 0x01):	Auto Logo command character, space conversion
ESC GS / 6 n (n = 0x01):	Partial cut valid just prior to Auto Logo printing
ESC GS / W:	Register Auto Logo definition data to non-volatile memory.

2) Embed registered command character in print data and transmit.
"CHEESE BURGER/2" → "/" is recognized as the command character.
The command character is converted to a space and "2" specifies logo 2.

ESC GS / W

[Name] Register Auto Logo setting to non-volatile memory

[Code]					
	ASCII	ESC	GS	/	W
	Hexadecimal	1b	1d	2f	57
	Decimal	27	29	47	87

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Registers Auto Logo setting to non-volatile memory.
After registration ends, resets the printer.
This command is ignored while Auto Logo is executing.

ESC GS / C

[Name] Initialize Auto Logo setting from non-volatile memory

[Code]					
	ASCII	ESC	GS	/	C
	Hexadecimal	1b	1d	2f	43
	Decimal	27	29	47	67

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function] Initializes registered data of the Auto Logo function in the non-volatile memory.
After initialization ends, resets the printer.
This command is ignored while Auto Logo is executing.

The following shows the initial values of the Auto Logo function.

	Initial Value
Auto Logo Function	OFF
Command Character	None
User Macro 1	None
User Macro 2	None
Convert Command Character	Do not print
Partial Cut Prior to Auto Logo Printing	Invalid

ESC GS / 1 n

[Name] Set ON/OFF for Auto Logo function

[Code]						
	ASCII	ESC	GS	/	1	n
	Hexadecimal	1b	1d	2f	31	n
	Decimal	27	29	47	49	n

[Defined Area]	Thermal	:	0 ≦ n ≦ 2
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets ON/OFF for Auto Logo function.
This setting is registered to non-volatile memory by the ESC GS / W command.
When in the raster mode, the Auto Logo function is ignored.
This command is ignored while Auto Logo is executing.

n	Setting
0	Auto Logo Function OFF
1	Standard Auto Logo Function ON <Operating Specifications> (1) Auto Logo function starts up using the existing system cut command as a trigger. (2) Execute printing if print data exists in the image buffer. (3) Execute user macro 1. (4) Auto Log Printing (5) Execute user macro 2.
2	Simple Auto Logo Function ON <Operating Specifications> (1) Auto Logo function starts up using the existing system cut command as a trigger. (2) Execute printing if print data exists in the image buffer. (3) Execute center alignment. (4) Print logo 2 (2-color printing setting: Logo 3) (5) Paper is fed to cutting position, then a partial cut is executed. (6) Printing of logo 1. (7) Recover position alignment setting **(Note)** **When this is set, user macros and command characters are invalid.** **When this is set, the command character "/" is printed as "/".)**

The following shows the command that is the trigger for the Auto Logo function.
If the standard Auto Logo function is turned ON by n = 1, the trigger command below functions only as a trigger, so the cutting operation is not executed. Therefore, it is necessary to register an arbitrary cutting command in user macro 2.
If the simple Auto Logo function is turned ON by n = 2, the cutting command is executed, and is the trigger for the simple Auto Logo function.

- ESC d n: Cut Command
- FF: Allocated to cut function

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS / 2 n

[Name] Set command characters

[Code]						
	ASCII	ESC	GS	/	3	n
	Hexadecimal	1b	1d	2f	32	n
	Decimal	27	29	47	50	n

[Defined Area]
Thermal : 32 ≦ n ≦ 127, n = 0
Slip : -
Validation : -

[Initial Value]
Thermal : n = 0
Slip : -
Validation : -

[Function]

<Thermal>

Sets command character for the Auto Logo function.
This setting is registered to non-volatile memory by the ESC GS / W command.
This command is ignored while Auto Logo is executing.

n	Setting
32 to 127	Command Character
0	No set command characters

Command characters are characters that are commands for specifying the logo number to print with Auto Logo printing.
If the "/" is specified for the command character, "/2/3" is embedded in the print data.
The printer processes "/" not as character data but as a command, stores the number continuing after, and prints as an Auto Logo in the stored order.
Therefore, if "/2/3/" is embedded, the Auto Logo is printed in the order of logo 2, logo 3.
At that time, if the specified logo is not registered, logo printing is ignored.
If the setting is for not command character setting, no logo will be printed.
Note that "/2/3" is processed as a command so there is no print.
However, "/2/3/" is converted to a space by the ESC GS /5 n command.
Also, only the initial logo is printed if the same logo is duplicated, such as in "/2/3/2/2."
32 logos can be stored as Auto Logos.
Continuing the command character, the following shows the defined area of the character d of the logo number specification.

"1" ≦ d ≦ "9" (49 ≦ d ≦ 57) → Logo number 1 to 9
"A" ≦ d ≦ "F" (65 ≦ d ≦ 70) → Logo number 10 to 16

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS / 3 nL nH d1 d2 … dk

[Name] Set user macro 1

[Code]											
	ASCII	ESC	GS	/	3	nL	nH	d1	d2	...	dk
	Hexadecimal	1b	1d	2f	33	nL	nH	d1	d2	...	dk
	Decimal	27	29	47	51	nL	nH	d1	d2	...	dk

[Defined Area] Thermal : 1 ≦ nL ≦ 64, nH = 0
1 ≦ (nL + nH x 256) ≦ 64
dk = (nL + nH x 256)
0 ≦ d ≦ 255
Slip : -
Validation : -

[Initial Value] Thermal : No user macro 1 setting
Slip : -
Validation : -

[Function]

<Thermal>

Sets user macro 1 for the Auto Logo function.
This setting is registered to non-volatile memory by the ESC GS / W command.
This command is ignored while Auto Logo is executing.
Registers print data in user macro 1.
Maximum 64 bytes of registered data
Note that registering Auto Logo command characters in the user macros is prohibited.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS / 4 nL nH d1 d2 … dk

[Name] Set user macro 2

[Code]											
	ASCII	ESC	GS	/	4	nL	nH	d1	d2	...	dk
	Hexadecimal	1b	1d	2f	34	nL	nH	d1	d2	...	dk
	Decimal	27	29	47	52	nL	nH	d1	d2	...	dk

[Defined Area] Thermal : 1 ≦ nL ≦ 64, nH = 0

1 ≦ (nL + nH x 256) ≦ 64

dk = (nL + nH x 256)

0 ≦ d ≦ 255

Slip : -

Validation : -

[Initial Value] Thermal : No user macro 2 setting

Slip : -

Validation : -

[Function]

<Thermal>

Sets user macro 2 for the Auto Logo function.
This setting is registered to non-volatile memory by the ESC GS / W command.
This command is ignored while Auto Logo is executing.
Registers print data in user macro 2.
Maximum 64 bytes of registered data
Note that registering Auto Logo command characters in the user macros is prohibited.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS / 5 n

[Name] Set command character switching method

[Code]						
	ASCII	ESC	GS	/	5	n
	Hexadecimal	1b	1d	2f	35	n
	Decimal	27	29	47	53	n

[Defined Area]	Thermal	:	0 ≦ n ≦ 1
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets command character conversion method for the Auto Logo function.
This setting is registered to non-volatile memory by the ESC GS / W command.
This command is ignored while Auto Logo is executing.

n	Setting
0	Does not print command character or logo number continuing after that.
1	Converts the command character and logo number that follows in a space character (0 x 20).

If “/” is specified for the command character, the “/2” embedded in the print data is processed not as a character string but as a command.
At that time, “/2” is processed as a command so there is no print.
However, “/2” is converted to a space by the n = 1 specification of this command.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS / 6 n

[Name] Partial cut setting just prior to Auto Logo printing

[Code]						
	ASCII	ESC	GS	/	6	n
	Hexadecimal	1b	1d	2f	36	n
	Decimal	27	29	47	54	n

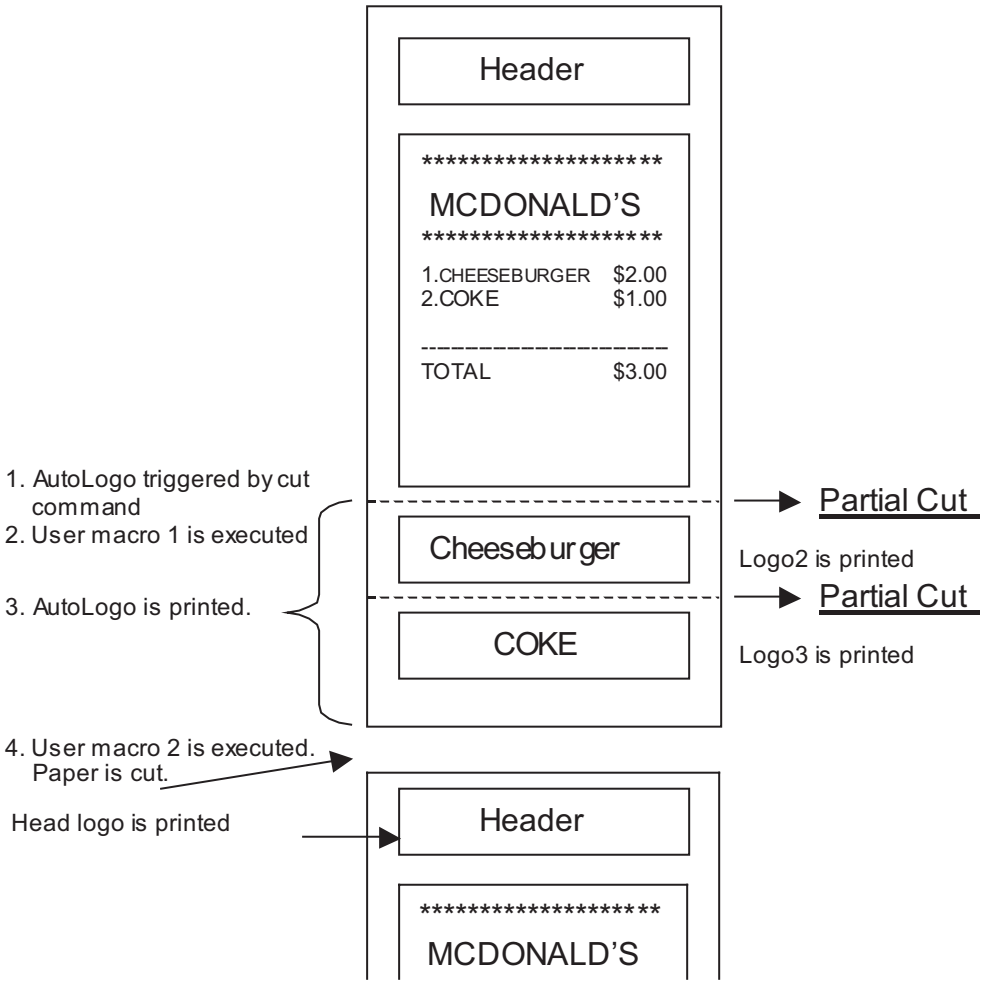
[Defined Area] Thermal : 0 ≦ n ≦ 1
Slip : -
Validation : -

[Initial Value] Thermal : n = 0
Slip : -
Validation : -

[Function]
<Thermal>

Sets the partial cut setting just prior to Auto Logo printing
This setting is registered to non-volatile memory by the ESC GS / W command.
This command is ignored while Auto Logo is executing.

n	Setting
0	Does not execute partial cut just prior to Auto Logo printing
1	Executes partial cut just prior to Auto Logo printing



This command selects execution of a partial cut just prior to Auto Logo Logo 2, and Logo 3, when executing Logos 2 and 3 as an Auto Logo print, as shown above.
If a partial cut is set to be executed by this function, it is possible to supply coupons printed by Auto Logo cut by the partial cut.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

3-9) 2-dimensional Bar Codes PDF417 Command Details

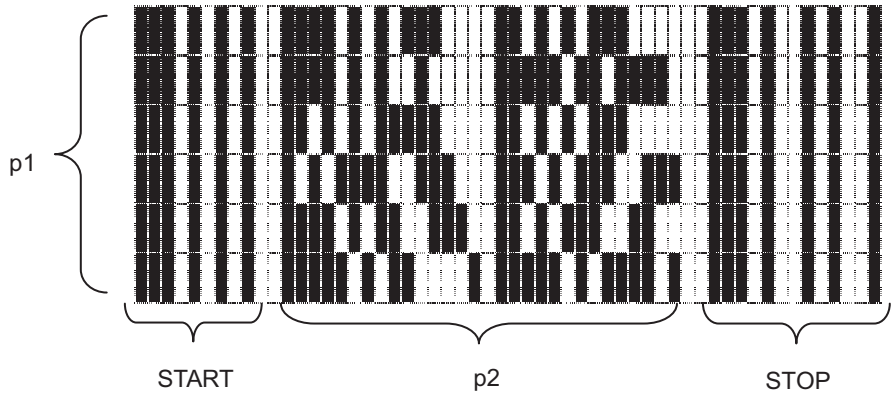
This command prints 2-dimensional bar codes PDF417.
Commands for 2-dimensional bar codes PDF417 are separated into the following four functions.

1) Bar code type setting (<ESC> <GS> “x” “S”)
2) Bar code data setting (<ESC> <GS> “x” “D”)
3) Bar code printing (<ESC> <GS> “x” “P”)
4) Get bar code expansion information (<ESC> <GS> “x” “I”)

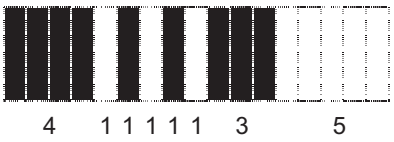
The details of the functions are outlined below.

1) Bar code type setting

These commands set the bar code type.
These are all set to default. Only use them if you wish to make changes. (Refer to following details for settings.))



PDF417 are composed of fixed patterns for start and stop, and bar patterns called code words.
Code words are composed of 17 modules.



<Code Word>

Specify the p1 and p2 values using <ESC> <GS> “x” “S” “0.”
With the USE_LIMITS mode, specify the ratio of p1 and p2; with the USE_FIXED mode, specify the p1 (number of lines) and p2 (number of code words per line).

Specify the error correction level value using <ESC> <GS> “x” “S” “1.”
It is possible to read PDF417 even part of the data is corrupted, using error correction.
If this level is raised, the bar code size is increased because there is more backup information.

Specify the size of the module that composes code words using <ESC> <GS> “x” “S” “2” and <ESC> <GS> “x” “S” “3.”
The X direction size of the module is determined by <ESC> <GS> “x” “S” “2” and the Y direction size of the module is determined from an aspect ratio using <ESC> <GS> “x” “S” “3.”
The module size setting is the basis for the generated bar code image, so print results will differ according to these settings.

<Printable Bar Code Size>

Vertical Size (Dots)	Horizontal Size (Dots)
640	640

These are individual settings, so the following errors may occur even if there are no problems. In such cases, the bar code will not be generated, and the (3) print command ((<ESC> <GS> “x” “P”) will be ignored.
• An error occurs when generating the bar code by the combination of bar code settings.
• When the generated bar code exceeds the printable PDF417 size.
• When the print data exceeds the currently set print region.

It is recommended to use the (4) Get bar code expansion information command (<ESC> <GS> “x” “I”) as a means for checking for these errors prior to printing.

2) Bar code data setting command
This command set the bar code print data.

3) Bar code printing command
This command prints the bar codes based on the settings of (1) and (2).

4) Get bar code expansion information command
This command checks whether a bar code can be printed based on the settings of (1) and (2).

= Precautions When Using the Commands =
• For (1) and (2), the setting values are retained if the following operations are not applied.
• New setting command is sent.
• Initialize commands are sent (<ESC> @, <CAN>)
• Power is turned off.
• With regard to (3) and (4), send as needed.
• Printing
• When printing, the horizontal tabs, absolute position specification, relative position specification, and position movement using position alignment are valid.
• Upside down printing and 2-color printing are possible.
• Bar codes to be printed should always be confirmed through an actual printout.

Lastly is a command transmission example.

(1) Bar code type setting
<ESC> <GS> “x” “S” “0” 0 2 3: Sets bar code size to USE_LIMITS = 2:3
<ESC> <GS> “x” “S” “1” 3: Sets ECC level to 3.
<ESC> <GS> “x” “S” “2” 3: Sets module X direction size to 3 dots.
<ESC> <GS> “x” “S” “3” 3: Sets module aspect ratio to 3.

(2) Bar code data setting
<ESC> <GS> “x” “D” 10 0 “0123456789”: Sets bar code data.

(3) Print bar code
To confirm printability using the current settings, confirm the bar code expansion information.
<ESC> <GS> “x” “I”: Confirms bar code expansion information.
<ESC> <GS> “x” “P”: Prints

ESC GS x S 0 n p1 p2

[Name] PDF417 bar code size setting

[Code]									
	ASCII	ESC	GS	x	S	0	n	p1	p2
	Hexadecimal	1B	1D	78	53	30	n	p1	p2
	Decimal	27	29	120	83	48	n	p1	p2

[Defined Area] Thermal : n = 0, 1

When n = 0 1 ≦ p1 ≦ 99, 1 ≦ p2 ≦ 99

When n = 1 p1 = 0 or 3 ≦ p1 ≦ 90, p2 = 0 or 1 ≦ p2 ≦ 30 (However, this excludes p1 = p2 = 0.)

Slip : -

Validation : -

[Initial Value] Thermal : n = 0, p1 = 1, p2 = 2

Slip : -

Validation : -

[Function]

<Thermal>

Parameter details

n (Bar Code Size Specification Method)		p1, p2 (Size Specification)
0	USE_LIMITS (Specifies ratio of bar code vertical/horizontal directions)	p1: p2: Distribution ratio of vertical (p1) and horizontal (p2) However, p1: p2 = 1 : 99 to 10:1 (p1/p2 = 0.01 to 10)
1	USE_FIXED (Specifies number of lines, and number of columns in the bar code.)	p1: Number of lines (0, 3 to 90); p2: Number of columns (0, 1 to 30) However, p1 * p2 ≦ 928 If either p1 or p2 is set to 0, it indicates that that value is variable.

Setting of the bar code size using this command specifies the general size. The size is automatically corrected by other settings.

<Slip>, <Validation>

Only setting is valid

Setting is valid after switching to thermal.

ESC GS x S 1 n

[Name] Set PDF417 ECC (security level)

[Code]							
	ASCII	ESC	GS	x	S	1	n
	Hexadecimal	1B	1D	78	53	31	n
	Decimal	27	29	120	83	49	n

[Defined Area] Thermal : 0 ≦ n ≦ 8

Slip : -

Validation : -

[Initial Value] Thermal : n = 1

Slip : -

Validation : -

[Function]

<Thermal>

Parameter details

• n: : ECC level (0 to 8)

<Slip>, <Validation>

Only setting is valid

Setting is valid after switching to thermal.

ESC GS x S 2 n

[Name] Set PDF417 module X direction size

[Code]	ASCII	ESC	GS	x	S	2	n
	Hexadecimal	1B	1D	78	53	32	n
	Decimal	27	29	120	83	50	n

[Defined Area]	Thermal	:	1 ≦ n ≦ 10
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 2
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Parameter details
• n : Sets the module X direction size (x-dim) (units: dots)
Specification using this command is recommended to be 2 ≦ n.
To use with n = 1, confirm by actual use.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS x S 3 n

[Name] Set PDF417 module aspect ratio

[Code]	ASCII	ESC	GS	x	S	3	n
	Hexadecimal	1B	1D	78	53	33	n
	Decimal	27	29	120	83	51	n

[Defined Area]	Thermal	:	1 ≦ n ≦ 10
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 3
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Parameter details
• n: Sets module aspect ratio (asp).
The module Y direction size is set to [x-dim * asp] by this command.
Specification using this command is recommended to be 2 ≦ n.
To use with n = 1, confirm by actual use.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS x D nL nH d1 d2 … dk

[Name] PDF417 bar code data setting

[Code]											
ASCII	ESC	GS	x	D	nL	nH	d1	d2	…	dk
Hexadecimal	1B	1D	78	44	nL	nH	d1	d2	…	dk
Decimal	27	29	120	68	nL	nH	d1	d2	…	dk

[Defined Area] Thermal : 0 ≦ nL ≦ 255, 0 ≦ nH ≦ 255
1 ≦ (nL + nH x 256) ≦ 1024
0 ≦ d ≦ 255, 1 ≦ k ≦ 1024
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]
<Thermal>

Parameter details
• nL+nH×256: Bar code data count
• dk: Bar code data (max. 1024 data)

When [nL+nH×256] is outside of the defined area, data of [nL+nH×256] bytes is received and discarded.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS x P

[Name] Print PDF417 bar code

[Code]					
ASCII	ESC	GS	x	P
Hexadecimal	1B	1D	78	50
Decimal	27	29	120	80

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]
<Thermal>

Prints bar code data.
If there is unprinted data in the line buffer, this command is executed after printing that data. Therefore, it is not possible to print with other data in the same line (characters, bit images, bar codes).
Also, if the following errors occur, this command is ignored.
• An error occurs when generating the bar code by the combination of bar code settings.
• When the generated bar code exceeds the printable PDF417 size.
• When the print data exceeds the currently set print region.
• Bar codes to be printed should always be confirmed through an actual printout.

<Slip>, <Validation>

Four bytes ignored

ESC GS x l

[Name] Get PDF417 bar code expansion information

[Code]

ASCII	ESC	GS	x	l
Hexadecimal	1B	1D	78	49
Decimal	27	29	120	73

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

In printing bar codes with the current setting and the printing starting position using this command, information such as the presence of errors is sent to the printer.
Therefore, it is possible to confirm whether printing is possible before actual printing, with this command.
If there is an error, the command is received and discarded even if the print command ESC GS x P is sent.

Also, if the following errors occur, “Error” information is sent to the printer.
• When an error occurs when generating the bar code by the combination of bar code settings
• When the generated bar code exceeds the printable PDF417 size.
• When the print data exceeds the currently set print region.

Transmission format: <ESC> <GS> “x” “l” n

n	
0	No
1	Error

<Slip>, <Validation>

Send <ESC> <GS> “x” “l” 1 (error)

3-10) Print Starting Trigger Control Command Details

This command is for models equipped with an expansion control function that page-controls the command in line units by page-controlling the image buffer.

ESC GS g 0 m n

[Name] Print starting trigger

[Code]							
	ASCII	ESC	GS	g	0	m	n
	Hexadecimal	1B	1D	67	30	m	n
	Decimal	27	29	103	48	m	n

[Defined Area]	Thermal	:	m = 0, n = 0
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Starts printing if there is unprinted data in the image buffer.
Transmission of this command is prohibited when in raster mode.

<Slip>, <Validation>

Six bytes ignored

ESC GS g 1 m n

[Name] Set print start timer

[Code]							
	ASCII	ESC	GS	g	1	m	n
	Hexadecimal	1B	1D	67	31	m	n
	Decimal	27	29	103	49	m	n

[Defined Area]	Thermal	:	m = 0, 0 ≦ n ≦ 255
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	See the models below.
	Slip	:	-
	Validation	:	-

[Function]
<Thermal>

Sets the print starting timer specified by n x 10 msec.
The print starting timer starts measuring from the point where the reception of print data stops, up to the set printing starting time.
When the set print starting time is reached, this starts printing if there is unprinted data in the image buffer.
Transmission of this command is prohibited when in raster mode.

n	Operating Mode
0	Print start timer = default value
1 to 255	Print start timer = n x 10 msec

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

3-11) 2-dimensional Bar Codes QR Code Command Details

* QR code is a registered trademark of DENSO WAVE Incorporated.

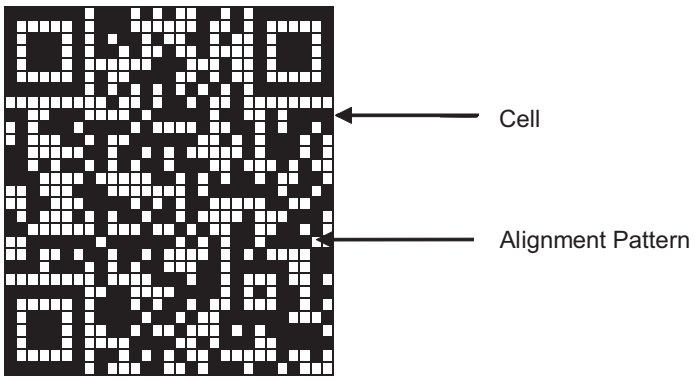
This command prints 2-dimensional bar codes of QR code.
Commands for 2-dimensional bar codes QR code are separated into the following four functions.

1) Bar code type setting (<ESC> <GS> “y” “S”)
2) Bar code data setting (<ESC> <GS> “y” “D”)
3) Page mode setting (Reserved)
4) Bar code printing (<ESC> <GS> “y” “P”)
5) Get bar code expansion information (<ESC> <GS> “y” “I”)

The details of the functions are outlined below.

1) Bar code type setting

These commands set the bar code type.
These are all set to default. Only use them if you wish to change them. (Refer to following details for settings.)



Specify model using <ESC> <GS> “y” “S” “0.”
Currently supported models are model 1 and model 2. To improve tolerance to distortion when codes are large on model 2, an alignment pattern has been added to the structure.

Specify the error correction level using <ESC> <GS> “y” “S” “1.”
It is possible to read QR code even part of the data is corrupted, using error correction.
If this level is raised, the bar code size is increased because there is more backup information.

Specify the size of the cell (one square region that composes the QR code) using <ESC> <GS> “y” “S” “2.”
The vertical and horizontal sizes for the QR code are equal length squares, but the size of the bar code image generated is determined by the cell size.
See Appendix 7 for details on the actual printed QR code size.

These are individual settings, so the following errors may occur even if there are no problems. In such cases, the bar code will not be generated, and the (4) print command ((<ESC> <GS> “y” “P”) will be ignored, and an error code will be returned with (5) get bar code expansion information.

- An error occurs when generating the bar code by the combination of settings.
- When the print data exceeds the currently set print region.

Therefore, it is recommended to use the (5) Get bar code expansion information command (<ESC> <GS> “y” “I”) as a means for checking for these errors prior to printing.

2) Bar code data setting command

This command set the bar code print data.
There are four types of data types that can be set by the QR code. They are: numbers, alpha-numeric characters, binary and Kanji characters. However, with these specifications, there are two data setting methods. They are: A method that specifies that data along with the bar code data (data manual analysis); and a method that specifies only the bar code data (data automatic analysis).

(3) Page mode setting command

This command is not used.

4) Bar code printing command

This command prints the bar codes based on the settings of (1) and (3).

5) Get bar code expansion information command

This command checks whether a bar code can be printed based on the settings of (1) to (3).

= Precautions When Using the Commands =

• For (1) to (3), the setting values are retained if the following operations are not applied.
• New setting command is sent.
• Initialize commands are sent (<ESC> @, <CAN>)
• Power is turned off.
• With regard to (2), when an error occurs in command transmission, the set data is cleared, and the command is invalid.
• With regard to (4) and (5), send as needed.
• Printing
• When printing, the horizontal tabs, absolute position specification, relative position specification, and position movement using position alignment are valid.
• Upside down printing and 2-color printing are possible.
• Bar codes to be printed should always be confirmed through an actual printout.

Below is a command transmission example.

(1) Bar code type setting

<ESC> <GS>“y”“S”“0” 1 : Set to model 1.
<ESC> <GS>“y”“S”“1” 0 : Set error correction level to L.
<ESC> <GS>“y”“S”“2” 3 : Set cell size to 3 dots.

2) Bar code data setting

• <ESC> <GS> “y” “D” “1” 0 20 0 “2005, January 1 (SAT)” <LF>
: Set bar code data (data automatic analysis)

• <ESC> <GS> “y” “D” “2” 10 1 4 0 “2005”“,” : Set bar code data (data manual analysis)
4 2 0 “Year” “,”
1 1 0 “1” “,”
4 2 0 “Month” “,”
1 1 0 “1” “,”
4 2 0 “Day” “,”
4 2 0 “(” “,”
2 3 0 “SAT” “,”
4 2 0 “)” “,”
3 1 0 <LF>

(3) Print bar code

To confirm printability using the current settings, confirm the bar code expansion information.

<ESC> <GS> “y” “I” : Confirms bar code expansion information.
<ESC> <GS> “y” “P” : Prints

ESC GS y S 0 n

[Name] Set QR code model

[Code]							
	ASCII	ESC	GS	y	S	0	n
	Hexadecimal	1B	1D	79	53	30	n
	Decimal	27	29	121	83	48	n

[Defined Area]	Thermal	:	1 ≦ n ≦ 2
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 2
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets the model.

• Parameter details

n	Set model
1	Model 1
2	Model 2

<Slip>, <Validation>

Only setting is valid

Setting is valid after switching to thermal.

ESC GS y S 1 n

[Name] Set QR code mistake correction level

[Code]							
	ASCII	ESC	GS	Y	S	1	n
	Hexadecimal	1B	1D	79	53	31	n
	Decimal	27	29	121	83	49	n

[Defined Area]	Thermal	:	0 ≦ n ≦ 3
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 0
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets the error correction level.

• Parameter details

n	Error Correction Level	Error Correction Rate (%)
0	L	7
1	M	15
2	Q	25
3	H	30

<Slip>, <Validation>

Only setting is valid

Setting is valid after switching to thermal.

ESC GS y S 2 n

[Name] Set QR code cell size

[Code]							
	ASCII	ESC	GS	y	S	2	n
	Hexadecimal	1B	1D	79	53	32	n
	Decimal	27	29	121	83	50	n

[Defined Area]	Thermal	:	1 ≦ n ≦ 8
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	n = 3
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Sets the cell size.

- Parameter details
- n: Cell size (Units: Dots)
- Specification using this command is recommended to be 3 ≦ n.
  To use with n = 1 and 2, confirm by actual use.

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

ESC GS y D 1 m nL nH d1 d2 … dk

[Name] QR code data setting (automatic setting)

[Code]													
	ASCII	ESC	GS	y	D	1	m	nL	nH	d1	d2	…	dk
	Hexadecimal	1B	1D	79	44	31	m	nL	nH	d1	d2	…	dk
	Decimal	27	29	121	68	49	m	nL	nH	d1	d2	…	dk

[Defined Area] Thermal : m = 0

0 ≦ nL ≦ 255, 0 ≦ nH ≦ 255 1 ≦ nL + nH × 256 ≦ 7089 (k = nL + nH × 256)

0 ≦ d ≦ 255

Slip : -

Validation : -

[Initial Value] Thermal : -

Slip : -

Validation : -

[Function]

<Thermal>

Automatically analyzes the bar code data type and sets the data.

- Parameter details
- nL+nH×256: Bar code data byte count
- dk: Bar code data (max. 7089 bytes)
- When using this command, the printer receives data of the number of bytes (k) specified by nL and nH, automatically analyzes the data and sets that as the bar code data.
- nL and nH specify the number of data bytes.
  When processed as a Kanji character code, two bytes are one character.
- If the parameter is outside of the defined area, the data for the amount of the counter is received and discarded.
  At that time, the bar code data is not cleared.
- The command data storage region is shared with the manual setting command, so data is updated each time either command is executed.

<Slip>, <Validation>

Only setting is valid

Setting is valid after switching to thermal.

ESC GS y D 2 a m1 n1L n1H d11 d12 … d1k m2 n2L n2H d21 d22 … d2k ml … dlk

[Name] QR code data setting (manual setting)

[Code]

ASCII	ESC	GS	y	D	2	a	m1	n1L	n1H	d11	d12	…	d1k
Hexadecimal	1B	1D	79	44	32	a	m1	n1L	n1H	d11	d12	…	d1k
Decimal	27	29	121	68	50	a	m1	n1L	n1H	d11	d12	…	d1k

ASCII	m2	n2L	n2H	D21	d22	…	d2k	ml	…	dlk
Hexadecimal	m2	n2L	n2H	D21	d22	…	d2k	ml	…	dlk
Decimal	m2	n2L	n2H	D21	d22	…	d2k	ml	…	dlk

[Defined Area] Thermal : 1 ≦ a ≦ 255

1 ≦ m ≦ 4

0 ≦ nL ≦ 255, 0 ≦ nH ≦ 255 1 ≦ nL + nH × 256 ≦ 7089 (k = nL + nH × 256)

0 ≦ d ≦ 255

1 ≦ l ≦ 255

Slip : -

Validation : -

[Initial Value] Thermal : -

Slip : -

Validation : -

[Function]

<Thermal>

Specifies the bar code data type and sets the data.

- Parameter details
- a : Block count
- m : Input data type
- nL + nH x 256 : Bar code data byte count
- dk : Bar code data (max. 7089 bytes)

m	Data Type	Data Defined Area (d)
1	Numbers	“0” to “9”
2	English Language Characters	“ ”, “$”, “%”, “*”, “+”, “-”, “.”, “/”, “:”, “0” to “9”, “A” to “Z”
3	Binary	0x00 to 0xFF
4	Kanji characters (Shift JIS)	0x8140 to 0x9FFC, 0xE040 to 0xEBBF However, the lower 8 bits are 0x40 to 0x7E, 0x80 to 0xFC.

- The printer receives the data type specified by m, based on the block count specified by a, and the data of the number of bytes (k) specified by nL and nH, and sets that as the bar code data.
- One block specified by a specifies m1 n1L n1H d11•••d1k (data type + data count + bar code data), and by sending a multiple of these continuously, data types can be included in one bar code.
- It is possible to set a maximum of 255 blocks with one command transmission.
- nL and nH specify the number of data bytes, so for Kanji characters, calculation is done using 1 character for two bytes.
- If the parameter is outside of the defined area, the data for the amount of the counter is received and discarded.
  At that time, the bar code data is cleared.
- The command data storage region is shared with the automatic setting command, so data is updated each time either command is executed.

<Slip>, <Validation>

Only setting is valid

Setting is valid after switching to thermal.

ESC GS y P

[Name] Print QR code

[Code]	ASCII	ESC	GS	y	P
	Hexadecimal	1B	1D	79	50
	Decimal	27	29	121	80

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

This command prints the bar code data.
When this command is received, the printer prints unprinted data, if unprinted data remains in the image buffer, then prints the bar code.
Margins of more than 4 cells are required around the QR code. The user must ensure the margins.
• Bar codes to be printed should always be confirmed through an actual printout.

<Slip>, <Validation>

Four bytes ignored

ESC GS y I

[Name] Get QR code expansion information

[Code]	ASCII	ESC	GS	y	I
	Hexadecimal	1B	1D	79	49
	Decimal	27	29	121	73

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

In expanding bar codes with the current setting using this command, information such as the size of the generated image and errors is sent to the printer.
Therefore, it is possible to confirm whether printing is possible before actual printing, with this command.
If there is an error in the bar code expansion, the command is ignored even if the expansion command ESC GS y P is sent.

Also, if the following errors occur, “Error” information is sent to the printer.
• When an error occurs when generating the bar code by the combination of bar code settings
• When the generated bar code exceeds the printable size.

Transmission format: <ESC> <GS> “y” “I” n1 n2

n1 n2	Bar Code Information
0x0000	Error
0x0001 to 0xffff	Size of one side of generated bar code data (Units: Dots)

<Slip>, <Validation>

Send <ESC> <GS> “y” “I” 0 0 (error)

3-12) Page Function Command Details

ESC GS h 0 k m n

[Name] 180˚ inversion function

[Code]	ASCII	ESC	GS	h	0	k	m	n
	Hexadecimal	1B	1D	68	30	k	m	n
	Decimal	27	29	104	48	k	m	n

[Defined Area] Thermal : 0 ≦ k ≦ 1, m = 0, n = 0
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]
<Thermal>

Sets to make 180˚ inversion function valid/invalid.

k	180˚ Inversion Function
0	Invalid
1	Valid

<180˚ Inversion Function>
When the 180˚ inversion function is valid, it is executed by the 180˚ inversion trigger.
However, this function is executed on print data that fits in the image buffer length.
If print data is larger than the image buffer length, the 180˚ inversion function is ignored.
Also, when starting printing using anything other than the 180˚ inversion trigger, the 180˚ inversion function is ignored.
This setting is not cleared by the ESC @, CAN commands.

180˚ Inversion Triggers
- Cutter Command: ESC d n
- FF Command: FF
- BM Detection Command: ESC d n, FF
- Print Startup Command: ESC GS g 0 m n
- Raster Mode: When executing FF

Example of Use
*1) 180˚ Inversion Function Valid: ESC GS h 0 k m n (k=0x01, m=0x00, n=0x00)
2) Transmit print data: Print data (print length is within the length of the image buffer)
3) Trigger command transmission: ESC d n (cutter command is 180˚ inversion trigger)

<Slip>, <Validation>

Only setting is valid
Setting is valid after switching to thermal.

(Note) When using this function, the data volume for one page should be within the printer's buffer length.

ESC GS h 1 k m n

[Name] Water mark function

[Code]								
ASCII	ESC	GS	h	1	k	m	n
Hexadecimal	1B	1D	68	31	k	m	n
Decimal	27	29	104	49	k	m	n

[Defined Area] Thermal : 0 ≦ k ≦ 2, 0 ≦ m ≦ 2, 1 ≦ n ≦ 255
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function]
<Thermal>

Sets to make water mark function valid/invalid.

k	Water Mark Function
0	Invalid
1	Valid Prints one logo specified by n at the position centered in the horizontal and vertical directions.
2	Valid Repeatedly prints logo specified by n from leading edge of the page to the trailing end of the page, at the position centered in the horizontal direction.

Set the forming method of the logo data to be printed as the water mark to make the image appropriate as the water mark with this setting.
If the appropriate image is not possible with this setting, re-register after forming the logo data registered as the water mark as the appropriate data.

m	Water Mark Data Forming
0	Prints logo data specified n as it is.
1	Thins logo data specified n 25% in the printout.
2	Thins logo data specified n 12.5% in the printout.

Specify the registered logo as the water mark.

n	Logo Number
1 to 255	Registered logo number If the specified logo number is not registered, the water mark will not be printed.

<Water Mark Function>
When the water mark inversion function is valid, it is printed by the water mark pinting trigger.
However, this function is executed on print data that fits in the image buffer length.
If print data is larger than the image buffer length, water mark printing is ignored.
Also, when starting printing using anything other than the water mark printing trigger, water mark printing is ignored.
When in 2-color printing mode, this function is invalid.
This setting is not cleared by the ESC @, CAN commands.

Water Mark Printing Triggers
- Cutter Command : ESC d n
- FF Command : FF
- BM Detection Command : ESC d n, FF
- Print Startup Command : ESC GS g 0 m n
- Raster Mode : When executing FF

Example of Use

1) Register logo to use as the water mark as logo #1.
2) Water mark function is valid.: ESC GS h 1 k m n (k=0x02, m=0x01, n=0x01)
3) Transmit print data: Print data (print length is within the length of the image buffer)
4) Trigger command transmission: ESC d n (cutter command is water mark printing trigger)

<Slip>, <Validation>
Only setting is valid
Setting is valid after switching to thermal.

(Note) When using this function, the data volume for one page should be within the printer's buffer length.

3-13) Slip/Validation Function Command Details

ESC SI n

[Name] Set slip sensor

[Code]

ASCII	ESC	SI	n
Hexadecimal	1B	0F	n
Decimal	27	15	n

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

Three bytes ignored

ESC FF n

[Name] Slip/Validation Function

[Code]

ASCII	ESC	FF	n
Hexadecimal	1B	0C	n
Decimal	27	12	n

[Defined Area]
Thermal : -
Slip : 2 ≦ n ≦ 5, 50 ≦ n ≦ 53, (“2” ≦ n ≦ “5”)
Validation : 2 ≦ n ≦ 5, 50 ≦ n ≦ 53, (“2” ≦ n ≦ “5”)

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Three bytes ignored

<Slip>

After printing data in the line buffer, the slip paper operation is executed according to the n value.

n	Slip Operation
2 to 5 50 to 53	Discharges paper toward the back (the forward direction)

<Validation>

After printing data in the line buffer, the validation printer operation is executed according to the n value.

n	Slip Operation
2 to 5 50 to 53	Discharges paper toward the back (the forward direction)

ESC VT m n

[Name] Sets slip paper discharge direction and discharge length

[Code]					
	ASCII	ESC	VT	m	n
	Hexadecimal	1B	0B	m	n
	Decimal	27	11	m	n

[Defined Area] Thermal : -
Slip : -
Validation : -

[Initial Value] Thermal : -
Slip : -
Validation : -

[Function] Four bytes ignored

ESC EM n m LF NUL

[Name] Set slip/validation automatic clamp

[Code]							
	ASCII	ESC	EM	n	M	LF	NUL
	Hexadecimal	1B	19	n	M	0A	00
	Decimal	27	25	n	M	10	0

[Defined Area] Thermal : -
Slip : 0 ≦ n ≦ 255
m = 0, 1, 48, 49
Validation : 0 ≦ n ≦ 255
m = 2, 3, 50, 51

[Initial Value] Thermal : -
Slip : n: MSW Setting
m = 0
Validation : n: MSW Setting
m = 0

[Function]

m	Function
0, 1, 48, 49	Sets the waiting time from inserting slip paper until the start of execution of automatic clamp according to n. n is the same as the MSW slip opening time setting (for details refer to the MSW settings for each printer).
2, 3, 50, 51	Sets the waiting time from inserting validation paper until the start of execution of automatic clamp according to n. n is the same as the MSW validation opening time setting (for details refer to the MSW settings for each printer).

<Thermal> Only setting is valid. Setting is valid after switching to slip or validation.

3-14) Page Mode Command Details

FF

[Name] Batch printing of page data (valid only in page mode)

[Code]

ASCII	FF
Hexadecimal	0C
Decimal	12

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Refer to “Page Control Command.”

<Slip>, <Validation>

When in page mode, the printer batch prints page data expanded in the page region, then returns to line mode.
After batch printing of the page mode, data in the page, the page print region and print direction are all initialized.
Note that when the printer is in line mode, nothing functions.

ESC n

[Name] Selects page mode

[Code]

ASCII		ESC	n
Hexadecimal		1B	6E
Decimal		27	110

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

<Thermal>

Two bytes ignored

<Slip>, <Validation>

Shifts from line mode (default) to page mode.
This command is valid when input at the top of the line. Page mode expands print data to the page coordinate region set by ESC * … and according to the rotation direction set by ESC T n, and prints all the data using FF in the end.
In page mode, print data is OR expanded to the page region so you can be free to overlappingly write characters and bit images and rotate characters.
In page mode, if print data + <LF> is set using the same method as line mode, the data will be automatically rotated at the printer.
Page mode has the following restrictions.

(1) Print Data Expansion
In page mode, because data is expanded in normal dot increments, characters accompanying half dots cannot be handled.
When page mode is entered, ANK fonts are automatically set to 5 x 9 (2P-1) fonts.
In page mode, the IBM block is changed to vertical 8 dot fonts.
Kanji characters (Kanji) cannot be printed.
When the character space is an odd number, 1 half dot is discarded.
Also, characters are expanded based on the base line, so vertical double tall expanded characters are cut when the top portion is at the page top line, and if they are at the second line, they sometimes can overlap the previous line.
For that reason, if vertical expanded characters are included in one line, add an extra <LF> prior to the print data line to ensure print region to allow the vertical expanded character to be printed.

(2) Paper feed command
In page mode, the paper feed command and line feed are executed as a movement of the expanded position, according to dot units.
The 1 coordinate for the X direction is 0.159 mm (1 half-dot), and the 1 coordinate for the Y direction is 0.176 mm (1 half-dot) as the units of the X and Y coordinates. The printing results will not be doubled in the X and Y directions for 0˚/180˚ rotations and 90˚/270˚ rotations.
With 90˚/270˚ rotations, the amount of paper feed and the height of the characters are reduced.
The font horizontal expansion and horizontal movement amounts are increased.
For example, when using 1/6 inch line feed with 0˚ rotation, 24 half-dots x 0.176 mm = 4.224 mm. However, with 90˚/270˚ rotations, 24 half-dots x 0.159 mm = 3.816 mm. There is a difference of 4.224 – 3.816 = 0.408 mm.
To rotate a check print of a determined form 90˚ or 270˚, create a program that considers this difference.

(3) • Setting Commands Received While in Page Mode
The following outlines three cases. (See each command for details.)
• Valid Command
• Commands that are valid when line mode is selected
• Ignored commands

Batch printing of page region data is executed by FF. After the FF, the printer returns to line mode. When returning to line mode, all conditions such as print data in the print region, region coordinate information, and rotation direction are cleared.

ESC !

[Name] Select line mode (Default)

[Code]

ASCII	ESC	!
Hexadecimal	1B	21
Decimal	27	33

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>

Two bytes ignored

<Slip>, <Validation>

Select line mode (Default)
When this command is executed in page mode, the printer returns to line mode without printing.
When returning to line mode, all conditions such as print data in the print region, region coordinate information, and rotation direction are cleared.

ESC * xL xH yL yH dxL dxH dyL dyH

[Name] Set page mode print region

[Code]

ASCII	ESC	*	xL	xH	yL	yH	dxL	dxH	dyL	dyH
Hexadecimal	1B	2A	xL	xH	yL	yH	dxL	dxH	dyL	dyH
Decimal	27	42	xL	xH	yL	yH	dxL	dxH	dyL	dyH

[Defined Area]

Thermal : -

Slip : 0 ≦ xL ≦ 255, 0 ≦ xH ≦ 2

0 ≦ yL ≦ 255, 0 ≦ yH ≦ 5

0 ≦ dxL ≦ 255, 0 ≦ dxH ≦ 2 (However, 0 ≠ dxL + dxH x 256) 1 ≦ dx ≦ 540 half-dots

0 ≦ dyL ≦ 255, 0 ≦ dyH ≦ 5 (However, 0 ≠ dyL + dyH × 256) 1 ≦ dy ≦ 1408 half-dots

Validation : 0 ≦ xL ≦ 255, 0 ≦ xH ≦ 2

0 ≦ yL ≦ 255, 0 ≦ yH ≦ 5

0 ≦ dxL ≦ 255, 0 ≦ dxH ≦ 2 (However, 0 ≠ dxL + dxH x 256) 1 ≦ dx ≦ 540 half-dots

0 ≦ dyL ≦ 255, 0 ≦ dyH ≦ 5 (However, 0 ≠ dyL + dyH × 256) 1 ≦ dy ≦ 1408 half-dots

[Initial Value]

Thermal : -

Slip : xL = 0, xH = 0, yL = 0, yH = 0, dxL = 28, dxH = 2, dyL = 128, dyH = 5

(X_0 = 0, Y_0 = 0, dx = 540, dy = 1408)

Validation : xL = 0, xH = 0, yL = 0, yH = 0, dxL = 28, dxH = 2, dyL = 128, dyH = 5

(X_0 = 0, Y_0 = 0, dx = 540, dy = 1408)

[Function]

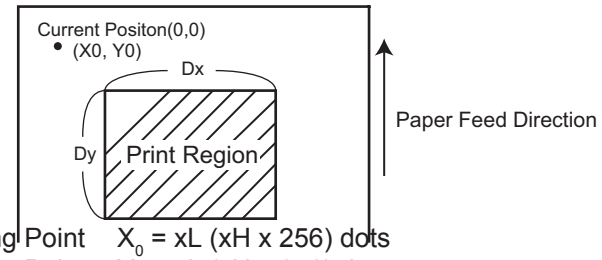
<Thermal>

The following commands are valid only when slip/validation have been selected. Their use is prohibited when thermal has been selected.

<Slip>, <Validation>

Set page mode print region

Use the left edge coordinate of the current position when the printer enters page mode as (0,0), and specify the starting point (X_0, Y_0) of the page region using xLxH,yLyH, and specify the length dx of the X direction using dxL, dxH, and the length dY of the Y direction using dyL, dyH.



Starting Point X_0 = xL (xH x 256) dots

Starting Point Y_0 = yL (yH x 256) dots

Length of Horizontal Direction Dx = dxL + (dxH x 256) dots

Length of Vertical Direction Dy = dyL + (dyH x 256) dots

If the parameter is out of range, this command is invalid.

This command is stored even in line mode. However, the position when the printer enters page mode is applied for the reference point (0,0).

Expansion of print data into the page is performed using the bottom edge of the characters as the base line, so a print region higher than the minimum of 9 dots is necessary for the height direction of the characters. (When using vertical double tall expanded characters, it is necessary to execute an extra paper feed in advance.)

ESC T n

[Name] Set page mode rotation direction

[Code]

ASCII	ESC	T	n
Hexadecimal	1B	54	n
Decimal	27	84	n

[Defined Area]
Thermal : -
Slip : 0 ≦ n ≦ 3, 48 ≦ n ≦ 51, (“0” ≦ n ≦ “3”)
Validation : 0 ≦ n ≦ 3, 48 ≦ n ≦ 51, (“0” ≦ n ≦ “3”)

[Initial Value]
Thermal : -
Slip : n = 0
Validation : n = 0

[Function]

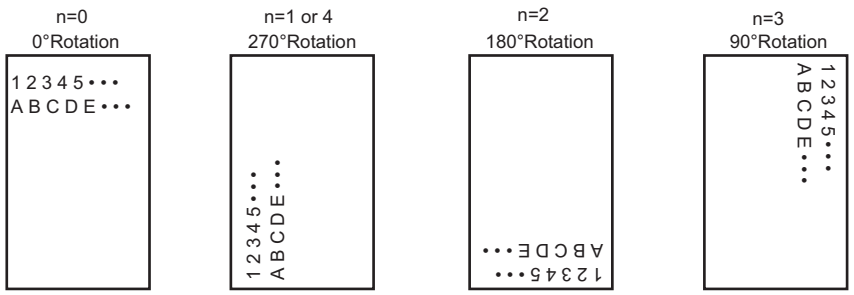
<Thermal>

Three bytes ignored

<Slip>, <Validation>

Sets the rotation in page mode to the items in the table below, according to the n value.
Setting valid only when line mode.

n	Rotation Direction
0, 48	0°
1, 49	270°
2, 50	180°
3, 51	90°



<Genend Concept of Rotation Diection>

3-15) Station Selection Command Details

ESC + A n

[Name] Select printer station

[Code]					
	ASCII	ESC	+	A	n
	Hexadecimal	1B	2B	41	n
	Decimal	27	43	65	n

[Defined Area]	Thermal	:	n = 0, 3, 4, “0”, “3”, “4”
	Slip	:	n = 0, 3, 4, “0”, “3”, “4”
	Validation	:	n = 0, 3, 4, “0”, “3”, “4”
[Initial Value]	Thermal	:	n = 0
	Slip	:	n = 0
	Validation	:	n = 0

[Function] Selects printer station

n	Selected Station
0, “0”	Selects Thermal Receipt Station
1, “1”	Reserved
2, “2”	Reserved
3, “3”	Selects Slip Station
4, “4”	Selects Validation Station

Switches to the printer station using this command after printing data in the line buffer. Therefore, always append an LF to the print data just before this command.

<Slip>, <Validation>

When station is switched, conditions such as data in the page, the page print region, and the printing direction are all initialized.
Command is ignored when page mode is selected.

3-16) Presenter Related Command Details

The following commands control the presenter functions.
The following commands are effective only on models equipped with a presenter.

ESC SYN 0 n

[Name] Execute presenter paper recovery

[Code]					
	ASCII	ESC	SYN	0	n
	Hexadecimal	1B	16	30	n
	Decimal	27	22	48	n

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

Four bytes ignored

ESC SYN 1 n

[Name] Set presenter paper automatic recovery function and automatic recovery time

[Code]					
	ASCII	ESC	SYN	1	n
	Hexadecimal	1B	16	31	n
	Decimal	27	22	49	n

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

Four bytes ignored

ESC SYN 3 n

[Name] Acquire presenter paper counter

[Code]					
	ASCII	ESC	SYN	3	n
	Hexadecimal	1B	16	33	n
	Decimal	27	22	51	n

[Defined Area]	Thermal	:	-
	Slip	:	-
	Validation	:	-
[Initial Value]	Thermal	:	-
	Slip	:	-
	Validation	:	-

[Function]

Four bytes ignored

ESC SYN 4 n

[Name] Initialize presenter paper counter

[Code]

ASCII	ESC	SYN	4	n
Hexadecimal	1B	16	4	n
Decimal	27	22	52	n

[Defined Area]
Thermal : -
Slip : -
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

Four bytes ignored

3-17) MICR Related Command Details

The following commands control MICR functions.
The following commands are effective only on models equipped with MICR.

ESC FS M m n

[Name] MICR function

[Code]						
	ASCII	ESC	FS	M	m	n
	Hexadecimal	1B	1C	4D	m	n
	Decimal	27	28	77	m	n

[Defined Area]
Thermal : -
Slip : 48 ≦ m ≦ 50 (“0” ≦ m ≦ “2”)
n = 48, 49
Validation : -

[Initial Value]
Thermal : -
Slip : -
Validation : -

[Function]

<Thermal>, <Validation>

Five bytes ignored

<Slip>

Performs operations on inserted slip paper (cleaning paper).
Note that if slip paper has been inserted, and already is targeted for printing, that slip paper is discharged to the back (the forward direction), and operations are performed on the newly inserted slip paper (cleaning paper).

m	Function
48	Reads format specified by n, and returns read character string. n=48 • • • E13B read format n=49 • • • CMC7 read format Reading successful • • • ESC FS M 0 n, read character string LF NUL Reading failed • • • ESC FS M 0 n, LF NUL
49	Reads with format specified by n, and returns read character string. If no slip paper has been inserted, an empty character is returned immediately that indicates no insertion. n=48 • • • E13B read format n=49 • • • CMC7 read format Reading successful • • • ESC FS M 1 n, read character string LF NUL Reading failed • • • ESC FS M 1 n, LF NUL Empty character string • • • ESC FS M 1 n LF NUL
50	Performs cleaning of the conveyance rollers and magnetic head by inserted cleaning paper. n is 48 or 49.

In page mode, five bytes ignored.

E13B Support Table

Type	Numbers	SYMBOL1	SYMBOL2	SYMBOL3	SYMBOL4
ASCII	0 to 9	T	A	O	D
Hex	30 to 39	54	41	4F	44
Decimal	48 to 57	84	65	79	68

CMC7 Support Table

Type	Numbers	S I	S II	S III	S IV	S V
ASCII	0 to 9	/	#	=	>	^
Hex	30 to 39	2F	23	3D	3E	5F
Decimal	48 to 57	47	35	61	62	94

4. CHARACTER CODE TABLES

Character Code Specifications References

5. APPENDIX

5-1) Appendix 1: Bar Code Specification Details <Thermal>

Refer to the dedicated manuals for characteristics and methods of use for each bar code symbol.
This section describes precautions and methods for setting when printing with the printer.

Bar code widths are set for each bar code according to the mode. The following describes each mode and the dot counts.
The user must ensure the specified printing position and quiet zone at the position where the bar code begins.

5-1-1) Code 39

Code 39 represents numbers 0 to 9 and the letters of the alphabet from A to Z.
These are the symbols most frequently used today in industry.

1. Length of characters in each mode

Items	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots
Wide Element Width	6 Dots	9 Dots	12 Dots	5 Dots	8 Dots	10 Dots	4 Dots	6 Dots	8 Dots
Ratio	1:3	1:3	1:3	1:2.5	1:2.7	1:2.5	1:2	1:2	1:2
Character Spacing	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots	2 Dots	3 Dots	4 Dots
Length of 1 Character	4mm	6mm	8mm	3.625mm	5.625mm	7.25mm	3.25mm	4.875mm	6.5mm

(*) The length of 1 character includes the character spacing.

2. Regulations
The start and stop bar code (*) in Code 39 are automatically inserted.

5-1-2) Interleaved 2 of 5

Interleaved 2 of 5 represents numbers 0 to 9.
Higher density of characters is possible and with JIS and EAN, and priting to cardboard for distribution has been standardized.

1) Narrow element width and length of symbols per 2 characters

Items	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	2 Dots	4 Dots	6 Dots	2 Dots	4 Dots	6 Dots	2 Dots	3 Dots	4 Dots
Wide Element Width	5 Dots	10 Dots	15 Dots	4 Dots	8 Dots	12 Dots	6 Dots	9 Dots	12 Dots
Ratio	1:2.5	1:2.5	1:2.5	1:2	1:2	1:2	1:3	1:3	1:3
Length of 1 Character	4mm	8mm	12mm	3.5mm	7mm	10.5mm	4.5mm	6.75mm	9mm

2. Regulations
- By selecting interleaved 2 of 5 bar code symbols, start and stop patterns are automatically inserted.
- When the bar code data digit count is odd, a zero is added to the highest value digit.
- Details conform to standards for AIM, USS-12/5, ANSI and JIS x 0502.

5-1-3) JAN/EAN/UPC

Used numbers, not only the bar code symbols, are controlled using JAN, EAN and UPC as shared common commercial codes.
Mainly, they are used for supermarkets such as shops and grocery stores.

1. Each mode and bar code width

Items		Mode 1	Mode 2	Mode 3
Module Width		2 Dots	3 Dots	4 Dots
Bar Code Width (*)	JAN/EAN-8	16.75mm	25.125mm	33.5mm
	JAN/EAN-13	23.75mm	35.625mm	47.5mm
	UPC-A	23.75mm	35.625mm	47.5mm
	UPC-E	12.75mm	19.125mm	25.5mm

(*) Includes the guard bar (left/right/center) but not the white space.

2. Regulations

• JAN/EAN/-8

Data is in 7 or 8 digits. The command is ignored for others.
The check digit uses a modulus weight of 10/3 and is automatically applied.
When the calculated value and the numerical value of the 8th digit differ, the calculated value has priority.

• JAN/EAN-13

Data is in 12 or 13 digits. The command is ignored for others.
The check digit uses a modulus weight of 10/3 and is automatically applied.
When the calculated value and the numerical value of the 13th digit differ, the calculated value has priority.

• UPC-A

Data is in 11 or 12 digits. The command is ignored for others.
The check digit uses a modulus weight of 10/3 and is automatically applied.
When the calculated value and the numerical value of the 12th digit differ, the calculated value has priority.

• UPC-A

Data is in 11 or 12 digits. The command is ignored for others.
The check digit uses a modulus weight of 10/3 and is automatically applied.
When the calculated value and the numerical value of the 12th digit differ, the calculated value has priority.
Data conversion to rectangles is automatic.
Data that cannot be shortened is processed as invalid data.

5-1-4) Code 128

These are bar code symbols that can print ASCII 128 characters.
For that reason, use thereof is increasing.

1. Each module and module width

Items	Mode 1	Mode 2	Mode 3
Module Width	2 Dots	3 Dots	4 Dots
Length of 1 Character (*)	2.75mm	4.125mm	5.5mm

(*) Start and stob bars not included.

2. Regulations
When using LF with the command, control codes are not sent by the host PC, so the control codes are sent as data, as shown below.
• When sending the following data, it is represented by a 2-character set.
% (25H) represented by %0 (25H 30H).
Control codes (00H to 1FH) represented by 40H to 5FH applied behind %.
Control code (7FH) represented by %5 (25H 35H).
Function codes represent 1 to 4 (31H to 34H) applied behind %.
Start codes represent 6 to 8 (36H to 38H) applied behind %.

• Stop code (SC)/Check character (CK) are automatically applied.
• When start code is omitted:
Uses START C when more than 4 digits continue after header.
Uses START A when initial data other than numbers are the control code.
Uses START B for other cases.

3. 2-Character set code table

<Control Codes>

<Control Codes>

Code	Format
NUL 00H	%@ 25H 40H
SOH 01H	%A 25H 41H
STX 02H	%B 25H 42H
ETX 03H	%C 25H 43H
EOT 04H	%D 25H 44H
ENQ 05H	%E 25H 45H
ACK 06H	%F 25H 46H
BEL 07H	%G 25H 47H
BS 08H	%H 25H 48H
HT 09H	%I 25H 49H
LF 0AH	%J 25H 4AH
VT 0BH	%K 25H 4BH
FF 0CH	%L 25H 4CH
CR 0DH	%M 25H 4DH
SO 0EH	%N 25H 4EH
SI 0FH	%O 25H 4FH
DLE 10H	%P 25H 50H
DC1 11H	%Q 25H 51H
DC2 12H	%R 25H 52H
DC3 13H	%S 25H 53H
DC4 14H	%T 25H 54H
NAK 15H	%U 25H 55H
SYN 16H	%V 25H 56H
ETB 17H	%W 25H 57H
CAN 18H	%X 25H 58H
EM 19H	%Y 25H 59H
SUB 1AH	%Z 25H 5AH
ESC 1BH	%[25H 5BH
FS 1CH	%\ 25H 5CH
GS 1DH	%] 25H 5DH
RS 1EH	%^ 25H 5EH
US 1FH	%_ 25H 5FH
DEL 7FH	%5 25H 35H

<Control Codes>

Code	Format
% 25H	%0 25H 30H

<Function Codes>

Code	Format	
FNC1	%1 25H 31H	*
FNC2	%2 25H 32H	*
FNC3	%3 25H 33H	*
FNC4	%4 25H 34H	*

<Start Codes>

Code	Format	
START A	%6 25H 36H	*
START B	%7 25H 37H	*
START C	%8 25H 38H	*

5-1-5) Code 93

1. Each mode and module width

Items	Mode 1	Mode 2	Mode 3
Module Width	2 Dots	3 Dots	4 Dots
Length of 1 Character (*)	2.25mm	3.375mm	4.5mm

(*) Start and stob bars not included.

2. Regulations
   - Start/stop codes are automatically applied.
   - Check character (C, K) is automatically applied.
   - 2 character set expression conforms to Code 128.

   However, items marked with a star are codes that can only be used with Code 128, and not with Code 93.

5-1-6) NW7 (CODERBAR)

NW7 normally uses either A through D as the start/stop codes and represents special symbols (- (minus sign)/$ (dollar sign)/: (colon)// (slash)/. (period)/+ (plus sign) between 0 to 9.

These are used as carrier package marking bar codes, DPE (photo prints) and for medical related industries (USA).

1. Length of characters in each mode

Items	Mode 1	Mode 2	Mode 3	Mode 4	Mode 5	Mode 6	Mode 7	Mode 8	Mode 9
Narrow Element Width	2	3	4	2	3	4	2	3	4
Wide Element Width	6	9	12	5	8	10	4	6	8
Ratio	1:3	1:3	1:3	1:2.5	1:2.7	1:2.5	1:2	1:2	1:2
Character Spacing (Dots)	2	3	4	2	3	4	2	3	4
Length of 1 Character (Normally mm)	3	4.5	6	2.75	4.25	5.5	2.5	3.75	5
(Width mm)	3.5	5.25	7	3.125	5.125	6.25	2.75	4.125	5.5

- With NW7, lengths differ because narrow elements and wide elements are included according to the characters.
- Normal characters (narrow: 5, wide: 2) and numbers (0 to 9), - and $
- Wide characters (narrow: 4, wide: 3) :,/,.,+, A to D
- Character spaces are included in 1 character length.

5-2) Appendix 2 – Status Specifications <Shared>

This function is valid 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.

5-2-1) ENQ Command Status

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

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Compulsion SW	Open	Closed	○				
6	Reception Buffer Overflow	Does not occur	Occurs	○				
5	Reception Buffer Empty	Has Data	Empty	○				
4	Fixed at "0"		-	-				
3	Paper end	Paper	No paper	○				
2	Other Errors	No	Yes	○				
1	Framing Error	No	Yes	○				
0	Parity Error	No	Yes	○				

• Reception over-flow errors/Framing errors/Parity errors
These errors are after holding the error and using this command to inquire the status and the error status is sent.
• Compulsion SW
When the conversion switch is ON, Bit 7 = 1.
• Other Errors
Indicates non-recoverable errors and cover open errors.

5-2-2) EOT Command Status

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

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7								
6	Presenter Paper Jam Error	No	Yes	×				
5	Paper Near-end (Outer Side)	Paper	No paper	×				
4	Fixed at "1"		-	-				
3	Paper end	Paper	No paper	○				
2	Paper Near-end (Inner Side)	Paper	No paper	○				
1	BM Error	No	Yes	○				
0	Fixed at "0"		-	-				

• BM Error
On models that use a common PE and BM sensor, if a continuous error is detected beyond a determined amount, it indicates not a black mark error, but a paper out error.

5-2-3) Automatic Status

Automatic 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 automatic status abide by the DIPSW settings for the initial values.
It is possible to change the conditions using the ESC RS a n command after turning ON the power.
Also, it is possible to get the automatic 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)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	Reserved (Fixed at 0)		-	-				
5	Printer Status Byte Count			○				
4	Fixed at "0"		-	-				
3	Printer Status Byte Count			○				
2	Printer Status Byte Count			○				
1	Printer Status Byte Count			○				
0	Fixed at "1"	-		-				

Actual transmission byte count and header – 1 table

Transmission Byte Count n (7 ≦ n ≦ 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 automatic status. The table below shows the composition of the Header -2.

Header -2 represents the automatic 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 automatic 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 automatic status version, it is acceptable to ignore Header – 2 received.

<Header -2 (Second Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	ASB Status Expansion	No Expansion	Expansion	-				
6	Version No.		-	○				
5	Version No.			○				
4	Fixed at "0"		-	-				
3	Version No.			○				
2	Version No.			○				
1	Version No.			○				
0	Fixed at "0"	-		-				

Actual automatic status version and header -2 table

Version No. n	Header -2
1	00000010B (02 Hex)
2	00000100B (04 Hex)
3	00000110B (06 Hex)
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)

Printer Status Version

Model Name	Version No.	Status
HSP7000	3(06 Hex)	Up to printer status 7 (9th byte) loaded

(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 for new information. (No log exists.)
The following shows the composition of the status.

<Printer status 1 Printer status (Third Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	OFFLINE By Switch Input	No	Occurs	×				
5	Cover Status	Closed	Open	○				
4	Fixed at "0"		-	-				
3	ONLINE/OFFLINE Status	ONLINE	OFFLINE	○				
2	Compulsion SW	Open	Closed	○				
1	ETB Command	Not Executed	Executed	○				
0	Fixed at "0"		-	-				

• ETB Command
Cleared when received at the host (by clearing bit 1 to 0, automatic status is not targeted to occur).

<Printer status 2 Error Information (Fourth Byte)>

Bit	Contents	Status		By model					
		"0"	"1"	HSP7000					
7	Fixed at "0"		-	-					
6	Stopped by high head temperature	Not stopped	Stopped	○					
5	Non-recoverable Error	No	Yes	○					
4	Fixed at "0"		-	-					
3	Auto-cutter Error	No	Yes	○					
2	Mechanical Error	No	Yes	○					
1	Not Used (Fixed at "0")			-					
0	Fixed at "0"		-	-					

<Printer status 3 Error Information (Fifth Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	Reception Buffer Overflow	Does not occur	Occurs	○				
5	Command Error (in Page Mode)	No	Yes	x				
4	Fixed at "0"		-	-				
3	BM Error	No	Yes	○				
2	Presenter Paper Jam Error	No	Yes	×				
1	Head Up Error	No	Yes	×				
0	Fixed at "0"		-	-				

• Reception Buffer Overflow
Cleared to 0 when returned to the host.
• Command Error (in Page Mode)
Command errors cleared to 0 when returned to the host.
• BM Error
On models that use a common PE and BM sensor, if a continuous error is detected beyond a determined amount, it indicates not a black mark error, but a paper out error.

<Printer status 4 Sensor Information (Sixth Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	Not Used (Fixed at "0")		-	-				
5	Not Used (Fixed at "0")			-				
4	Fixed at "0"		-	-				
3	Paper end	Paper	No paper	○				
2	Paper Near-end (Inner Side)	Paper	No paper	○				
1	Paper Near-end (Outer Side)	Paper	No paper	×				
0	Fixed at "0"		-	-				

<Printer status 5 Sensor Information (Seventh Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	Slip/Validation Condition			○				
5	Slip/Validation Condition			○				
4	Fixed at "0"		-	-				
3	Slip BOF Detector	Paper	No paper	○				
2	Slip TOF Detector	Paper	No paper	×				
	Slip COF Detector	Paper	No paper	○				
1	Presenter Paper Detector	No paper	Paper	×				
	Stack Sensor Paper Detector	No paper	Paper	×				
	Peeling Sensor Paper Detector	No paper	Paper	×				
	Slip TOF Detector	Paper	No paper	○				
0	Fixed at "0"		-	-				

Slip/Validation Condition Support Table

Bit 6	Bit 5	Condition
0	0	Slip Paper (MICR Target)
0	1	Slip Paper (Print Target)
1	0	Validation Paper (Print Target)
1	1	No paper

<Printer status 6 ETB Counter (Eighth Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	ETB Counter Bit-4			○				
5	ETB Counter Bit-3			○				
4	Fixed at "0"		-	-				
3	ETB Counter Bit-2			○				
2	ETB Counter Bit-1			○				
1	ETB Counter Bit-0			○				
0	Fixed at "0"		-	-				

(*) ETB Counter

This counter is the 5 bit ETB counter.
(It counts from 0 to 31.When ther counter overflows, it counts up from 31 to 0.))
This counter is incremented by 1 using the <ETB> command.
The ETB counter is initialized by the following commands. When doing so, ASB ETB status is cleared.
However, when initializing the ETB counter, ASB is not transmitted.

<ETB Counter Initialization Commands>

- <ESC><RS> E n : ETB Counter Initialization
- <CAN> : Cancel print data and initialize commands

<Printer status 7 Position for Presenter Paper (Ninth Byte)>

Bit	Contents	Status		By model				
		"0"	"1"	HSP7000				
7	Fixed at "0"		-	-				
6	Not Used (Fixed at "0")		-	×				
5	Not Used (Fixed at "0")		-	×				
4	Fixed at "0"		-	-				
3	Presenter Paper Position			×				
2	Presenter Paper Position			×				
1	Presenter Paper Position			×				
0	Fixed at "0"		-	-				

(4) <Note>

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

(5) Status identification method

Command/Functions	Status							
	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
ASB (Header -1)	0	*	*	0	*	*	*	1
ASB (Other than Header -1)	0	*	*	0	*	*	*	0

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

5-2-4) 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:

STAR ASB (Second Byte Bit-7=1) + Length (Length = 0x0000)

• When transmitting printer status other than STAR ASB:

STAR ASB (Second Byte Bit-7=1) + Length + Status Data

<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:

Status Type + Delimiter 1 + Data Type + Status Length + ***Printer Status*** + Delimiter 2

(1) Status Type (2byte or 4byte)
• 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" to "59": Reserved
- "60" to "99": Reserved
- "A0": MICR Function Command
- "A1" 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.
<Ex.> If n = 0x31 with the ESC SYN 3 n command, the third and fourth bytes are "31."

(2) Delimiter 1 (1 Byte)
Sends ":".

(3) Data Type (1byte)
Indicates the data type of the printer status, and sends "B" (binary type).

(4) Status Length (2byte)
2 byte value indicating byte count of printer status

(5) 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.

(6) Delimiter 2 (1 byte)
Sends ";".

3) Status transmission specifications list

Status Generating Factors	STAR ASB	Length	Status Data						
			Status Type		Delimiter 1	Data Type	Status Length	Printer Status	Delimiter 2
			First and Second Bytes Factors	Third and Fourth Bytes n Parameter					
ASB Auto Status	ASB	0x0000	--	--	--	--	--	--	--
ESC ACK SOH Printer Status Request	ASB	0x0000	--	--	--	--	--	--	--
ENQ Printer Status Request	ASB	0x0008	"01"	Omitted	":"	"B"	0x0001	Status	";"
EOT Printer Status Request	ASB	0x0008	"02"	Omitted	":"	"B"	0x0001	Status	";"
ESC SYN 3 n Presenter Counter Request	ASB	0x0011	"13"	"00" ≦ n ≦ "01" "30" ≦ n ≦ "31"	":"	"B"	0x0008	Status	";"
ESC GS x I PDF417 Information Request	ASB	0x000C	"16"	Omitted	":"	"B"	0x0005	Status	";"
ESC GS y I QR Code Information Request	ASB	0x000D	"19"	Omitted	":"	"B"	0x0006	Status	";"
ESC FS M m n MICR Function	ASB	Variable Length	"A0"	"30" ≦ n ≦ "31"	":"	"B"	Variable Length	Status	";"

5-3) Appendix 3 – Blank Code Page Configuration <Thermal>

Blank code pages are character code tables that are empty from character code 80H to FFH. They can be specified using the command below.
• ESC GS t n (n = 255)

Also, it is possible to write data to the blank code page area using the command below.
• ESC GS = …..

When registering data, Font A and Font B data must be registered as a set.

1. Example configuration of Font A data. (12 x 24 font)

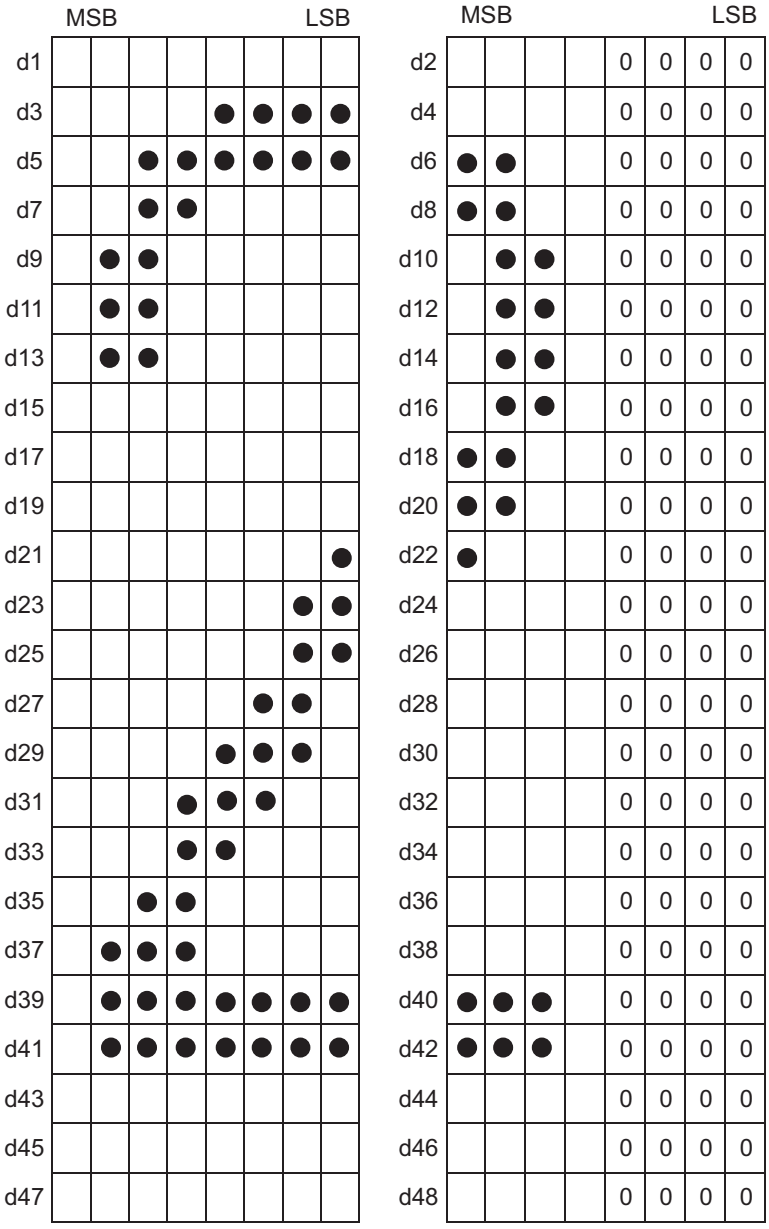
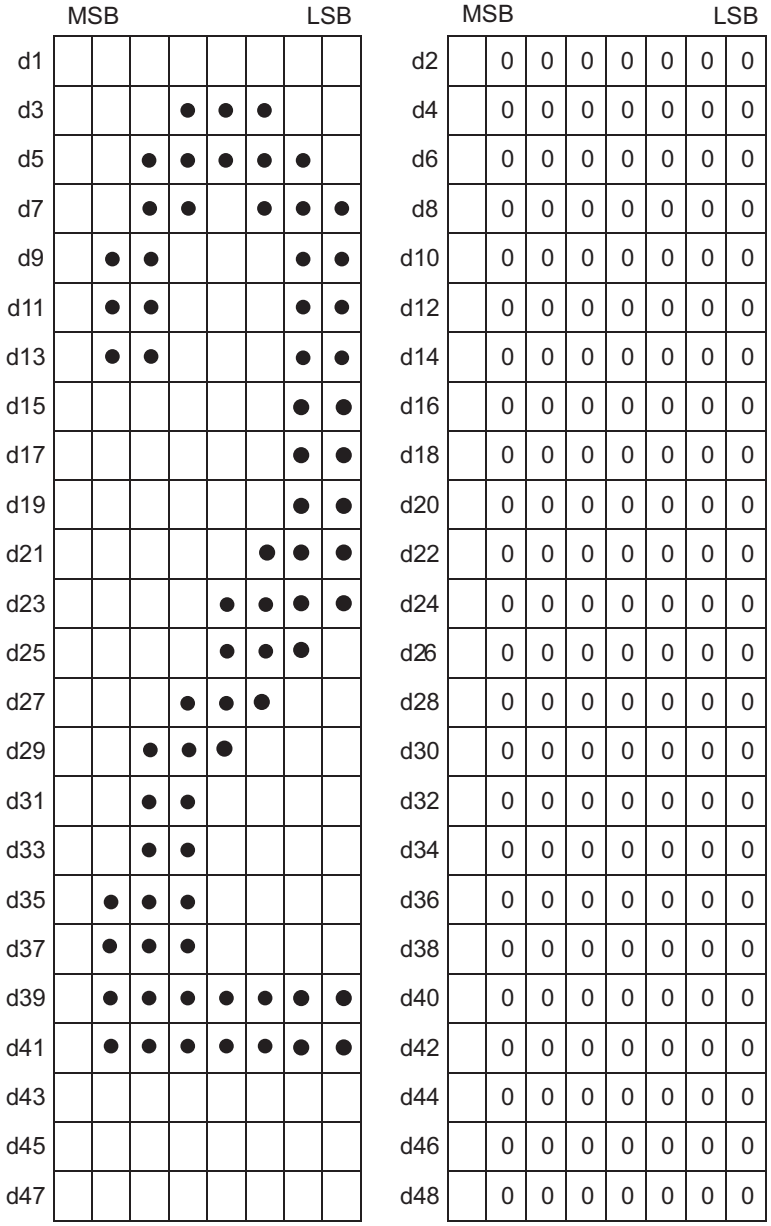


Fig. A-1 12 x 24 Font

2. Example configuration of Font B data. (9 x 24 font)

Fig. A-2 9 x 24 Font



5-4) Appendix 4: QR Code Maximum Input Character Count in Each Verson <Thermal>

1) Model 1 Versions and Maximum Input Character Count

Version	Number of Cells on One Side	Error Correction Level	Numbers	English Language Characters	Binary	Kanji Character
1	21	L	40	24	17	10
		M	33	20	14	8
		Q	25	15	11	6
		H	16	10	7	4
2	25	L	81	49	34	20
		M	66	40	28	17
		Q	52	31	22	13
		H	33	20	14	8
3	29	L	131	79	55	33
		M	100	60	42	25
		Q	81	49	34	20
		H	52	31	22	13
4	33	L	186	113	78	48
		M	138	84	58	35
		Q	114	69	48	29
		H	76	46	32	19
5	37	L	253	154	106	65
		M	191	116	80	49
		Q	157	95	66	40
		H	105	63	44	27
6	41	L	321	194	134	82
		M	249	151	104	64
		Q	201	122	84	51
		H	133	81	56	34
7	45	L	402	244	168	103
		M	311	188	130	80
		Q	253	154	106	65
		H	167	101	70	43
8	49	L	493	299	206	126
		M	378	229	158	97
		Q	301	183	126	77
		H	203	123	85	52
9	53	L	585	354	244	150
		M	441	267	184	113
		Q	369	223	154	94
		H	239	145	100	61
10	57	L	690	418	287	177
		M	526	319	219	135
		Q	433	262	180	111
		H	291	176	121	74
11	61	L	800	485	333	205
		M	608	368	253	156
		Q	493	299	205	126
		H	342	207	142	87
12	65	L	915	555	381	234
		M	694	421	289	178
		Q	579	351	241	148
		H	390	236	162	100
13	69	L	1030	624	429	264
		M	790	479	329	202
		Q	656	398	273	168
		H	454	275	189	116
14	73	L	1167	707	486	299
		M	877	531	365	225
		Q	738	447	307	189
		H	498	302	207	127

2) Model 2 Versions and Maximum Input Character Count

Version	Number of Cells on One Side	Error Correction Level	Numbers	English Language Characters	Binary	Kanji Character
1	21	L	41	25	17	10
		M	34	20	14	8
		Q	27	16	11	7
		H	17	10	7	4
2	25	L	77	47	32	20
		M	63	38	26	16
		Q	48	29	20	12
		H	34	20	14	8
3	29	L	127	77	53	32
		M	101	61	42	26
		Q	77	47	32	20
		H	58	35	24	15
4	33	L	187	114	78	48
		M	149	90	62	38
		Q	111	67	46	28
		H	82	50	34	21
5	37	L	255	154	106	65
		M	202	122	84	52
		Q	144	87	60	37
		H	106	64	44	27
6	41	L	322	195	134	82
		M	255	154	106	65
		Q	178	108	74	45
		H	139	84	58	36
7	45	L	370	224	154	95
		M	293	178	122	75
		Q	207	125	86	53
		H	154	93	64	39
8	49	L	461	279	192	118
		M	365	221	152	93
		Q	259	157	108	66
		H	202	122	84	52
9	53	L	552	335	230	141
		M	432	262	180	111
		Q	312	189	130	80
		H	235	143	98	60
10	57	L	652	395	271	167
		M	513	311	213	131
		Q	364	221	151	93
		H	288	174	119	74
11	61	L	772	468	321	198
		M	604	366	251	155
		Q	427	259	177	109
		H	331	200	137	85
12	65	L	883	535	367	226
		M	691	419	287	177
		Q	489	296	203	125
		H	374	227	155	96
13	69	L	1022	619	425	262
		M	796	483	331	204
		Q	580	352	241	149
		H	427	259	177	109
14	73	L	1101	667	458	282
		M	871	528	362	223
		Q	621	376	258	159
		H	468	283	194	120
15	77	L	1250	758	520	320
		M	991	600	412	254
		Q	703	426	292	180
		H	530	321	220	136

Version	Number of Cells on One Side	Error Correction Level	Numbers	English Language Characters	Binary	Kanji Character
16	81	L	1408	854	586	361
		M	1082	656	450	277
		Q	775	470	322	198
		H	602	365	250	154
17	85	L	1548	938	644	397
		M	1212	734	504	310
		Q	876	531	364	224
		H	674	408	280	173
18	89	L	1725	1046	718	442
		M	1346	816	560	345
		Q	948	574	394	243
		H	746	452	310	191
19	93	L	1903	1153	792	488
		M	1500	909	624	384
		Q	1063	644	442	272
		H	813	493	338	208
20	97	L	2061	1249	858	528
		M	1600	970	666	410
		Q	1159	702	482	297
		H	919	557	382	235
21	101	L	2232	1352	929	572
		M	1708	1035	711	438
		Q	1224	742	509	314
		H	969	587	403	248
22	105	L	2409	1460	1003	618
		M	1872	1134	779	480
		Q	1358	823	565	348
		H	1056	640	439	270
23	109	L	2620	1588	1091	672
		M	2059	1248	857	528
		Q	1468	890	611	376
		H	1108	672	461	284
24	113	L	2812	1704	1171	721
		M	2188	1326	911	561
		Q	1588	963	661	407
		H	1228	744	511	315
25	117	L	3057	1853	1273	784
		M	2395	1451	997	614
		Q	1718	1041	715	440
		H	1286	779	535	330
26	121	L	3283	1990	1367	842
		M	2544	1542	1059	652
		Q	1804	1094	751	462
		H	1425	864	593	365
27	125	L	3514	2132	1465	902
		M	2701	1637	1125	692
		Q	1933	1172	805	496
		H	1501	910	625	385
28	129	L	3669	2223	1528	940
		M	2857	1732	1190	732
		Q	2085	1263	868	534
		H	1581	958	658	405
29	133	L	3909	2369	1628	1002
		M	3035	1839	1264	778
		Q	2181	1322	908	559
		H	1677	1016	698	430
30	137	L	4158	2520	1732	1066
		M	3289	1994	1370	843
		Q	2358	1429	982	604
		H	1782	1080	742	457

Version	Number of Cells on One Side	Error Correction Level	Numbers	English Language Characters	Binary	Kanji Character
31	141	L	4417	2677	1840	1132
		M	3486	2113	1452	894
		Q	2473	1499	1030	634
		H	1897	1150	790	486
32	145	L	4686	2840	1952	1201
		M	3693	2238	1538	947
		Q	2670	1618	1112	684
		H	2022	1226	842	518
33	149	L	4965	3009	2068	1273
		M	3909	2369	1628	1002
		Q	2805	1700	1168	719
		H	2157	1307	898	553
34	153	L	5253	3183	2188	1347
		M	4134	2506	1722	1060
		Q	2949	1787	1228	756
		H	2301	1394	958	590
35	157	L	5529	3351	2303	1417
		M	4343	2632	1809	1113
		Q	3081	1867	1283	790
		H	2361	1431	983	605
36	161	L	5836	3537	2431	1496
		M	4588	2780	1911	1176
		Q	3244	1966	1351	832
		H	2524	1530	1051	647
37	165	L	6153	3729	2563	1577
		M	4775	2894	1989	1224
		Q	3417	2071	1423	876
		H	2625	1591	1093	673
38	169	L	6479	3927	2699	1661
		M	5039	3054	2099	1292
		Q	3599	2181	1499	923
		H	2735	1658	1139	701
39	173	L	6743	4087	2809	1729
		M	5313	3220	2213	1362
		Q	3791	2298	1579	972
		H	2927	1774	1219	750
40	177	L	7089	4296	2953	1817
		M	5596	3391	2331	1435
		Q	3993	2420	1663	1024
		H	3057	1852	1273	784

6. SPECIAL APPENDIX COMMAND LIST BY MODEL

○ : Valid Commands • : Valid Commands (Independent Functions on Thermal/Slip) ‡ : Command where only settings are valid
× : Invalid command (Ignored)

• Standard Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Font Style and Character Set	ESC RS F	○		○	‡					
	ESC GS t	○		○	○					
	ESC GS =	○		○	‡					
	ESC R	○		○	○					
	ESC /	○		○	○					
	ESC SP	○		○	○					
	ESC M	○		•	•					
	ESC P	○		•	•					
	ESC :	○		•	•					
	ESC g	○		○	‡					
Character Expansion Settings	ESC i	○		○	○					
	ESC W	○		○	○					
	ESC h	○		○	○					
	SO	○		○	○					
	DC4	○		○	○					
	ESC SO	○		○	○					
	ESC DC4	○		○	○					
Print Mode	ESC E	○		○	○					
	ESC F	○		○	○					
	ESC -	○		○	○					
	ESC _	○		○	○					
	ESC 4	○		○	○					
	ESC 5	○		○	○					
	ESC GS 4	○		‡	○					
	SI	○		○	○					
	DC2	○		○	○					
	ESC RS i	○		‡	○					
Line Spacing	LF		○	○	○					
	CR		○	○	○					
	ESC a		○	○	○					
	ESC z	○		•	•					
	ESC 0	○		•	•					
	ESC 1	○		•	•					
	ESC J		○	•	•					
	ESC j		○	×	○					
	ESC l		○	•	•					
	ESC A	○		•	•					
	ESC 2	○		○	○					
	ESC 3	○		×	○					
	ESC y	○		×	○					
Page Control	FF		○	○	×					
	ESC C	○		○	‡					
	ESC C 0	○		○	‡					
	VT		○	○	×					
	ESC B	○		○	‡					
Horizontal Direction Position	ESC I	○		○	○					
	ESC Q	○		○	○					
	HT		○	○	○					
	ESC D	○		○	○					
	ESC GS A		○	○	○					
	ESC GS R		○	○	○					
	ESC GS a	○		○	○					
Download	ESC &	○		○	○					
	ESC %	○		○	○					

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Bit Image Graphics	ESC K	○		○	○					
	ESC L	○		○	○					
	ESC k	○		○	×					
	ESC X	○		○	×					
	ESC ^	○		×	○					
Logo	ESC FS q	○		○	○					
	ESC FS p		○	○	○					
	ESC RS L		○	○	○					
Bar Codes	ESC b	○		○	○					
Cutter Control	ESC d		○	○	×					
External Device Drive	ESC BEL	○		○	○					
	BEL		○	○	○					
	FS		○	○	○					
	SUB		○	○	○					
	EM		○	○	○					
	ESC GS BEL		○	○	○					
	ESC GS EM DC1	○		○	○					
	ESC GS EM DC2		○	○	○					
Print Setting	ESC RS d	○		○	‡					
	ESC RS r	○		○	‡					
Status	ESC RS a	○		○	○					
	ESC ACK SOH		○	○	○					
	ENQ		○	○	○					
	EOT		○	○	○					
	ETB		○	○	○					
	ESC RS E		○	○	○					
Kanji Character	ESC p	○		○	○					
	ESC q	○		○	○					
	ESC $	○		○	○					
	ESC s	○		○	○					
	ESC t	○		○	○					
	ESC r	○		○	○					
	ESC u n	○		‡	○					
	ESC x n	○		‡	○					
	ESC w n	○		‡	○					
Others	RS		○	○	○					
	CAN		○	○	○					
	ESC @		○	○	○					
	ESC U	○		‡	○					
	ESC GS # m	○		○	○					
	ESC # @	○		○	○					
	ESC # N ?		○	○	○					
	ESC # *		○	○	○					
	ESC ?	○		○	○					
	DC3	○		○	○					
	DC1	○		○	○					

• Raster related commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Raster	ESC * r R		○	○	×					
	ESC * r A		○	○	×					
	ESC * r B		○	○	×					
	ESC * r C		○	○	×					
	ESC * r D		○	○	×					
	ESC * r E	○		○	×					
	ESC * r F	○		○	×					
	ESC * r P	○		○	×					
	ESC * r Q	○		○	×					
	ESC * r m l	○		○	×					
	ESC * r m r	○		○	×					
	ESC * r T	○		○	×					
	ESC * r K	○		○	×					
	b n1 n2 d1...dk		○	○	×					
	k n1 n2 d1...dk		○	○	×					
	ESC * r Y		○	○	×					
	ESC FF NUL		○	○	×					
	ESC FF EOT		○	○	×					
	ESC * r N		○	○	×					
	ESC * r V		○	○	×					

• Black mark related commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Black Mark Related Commands	ESC d		○	○	×					
	FF		○	○	×					
	ESC C	○		○	×					
	ESC C 0	○		○	×					
	VT		○	○	×					
	ESC B	○		○	×					

• 2-Color Printing Related Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
2-Color Printing Related Commands	ESC RS c	○		○	‡					
	ESC RS C	○		○	‡					
	ESC 4	○		○	○					
	ESC 5	○		○	○					
	ESC RS d	○		○	‡					
	ESC RS r	○		○	‡					
	ESC FS q	○		○	○					
	ESC FS p		○	○	○					

• Mark Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Mark Commands	ESC GS * 0		○	○	×					
	ESC GS * 1	○		○	‡					
	ESC GS * 2	○		○	‡					
	ESC GS * W		○	○	○					
	ESC GS * C		○	○	○					

• Auto Logo Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Auto Logo	ESC GS / W		○	○	○					
	ESC GS / C		○	○	○					
	ESC GS / 1	○		○	‡					
	ESC GS / 2	○		○	‡					
	ESC GS / 3	○		○	‡					
	ESC GS / 4	○		○	‡					
	ESC GS / 5	○		○	‡					
	ESC GS / 6	○		○	‡					

• PDF417 Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
PDF417	ESC GS x S 0	○		○	‡					
	ESC GS x S 1	○		○	‡					
	ESC GS x S 2	○		○	‡					
	ESC GS x S 3	○		○	‡					
	ESC GS x D	○		○	‡					
	ESC GS x P		○	○	×					
	ESC GS x I		○	○	○					

• Print Start Trigger Control Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Print Start-ing Trigger Control	ESC GS g 0		○	○	×					
	ESC GS g 1	○		○	‡					

• QR Code Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
QR Codes	ESC GS y S 0	○		○	‡					
	ESC GS y S 1	○		○	‡					
	ESC GS y S 2	○		○	‡					
	ESC GS y D 1	○		○	‡					
	ESC GS y D 2	○		○	‡					
	ESC GS y P		○	○	×					
	ESC GS y I		○	○	○					

• Page Function Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Page Function	ESC GS h 0	○		○	‡					
	ESC GS h 1	○		○	‡					

• Slip/Validation Function Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Slip/ Validation Function	ESC SI	○		×	×					
	ESC FF		○	×	○					
	ESC VT	○		×	×					
	ESC EM	○		×	○					

• Page Mode Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Page Mode	FF		○	×	○					
	ESC n		○	×	○					
	ESC !		○	×	○					
	ESC *	○		×	○					
	ESC T	○		×	○					

• Station Selection Command

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Station Selection	ESC + A		○	○	○					

• Presenter Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
Presenter	ESC SYN 0		○	×	×					
	ESC SYN 1	○		×	×					
	ESC SYN 3		○	×	×					
	ESC SYN 4		○	×	×					

• MICR Commands

Class	Commands	Class		Model Name						
				HSP7000						
		Set	Executed	Thermal	Slip					
MICR	ESC FS M		○	×	○					

7. SPECIAL APPENDIX COMMAND FUNCTION LIST

7-1) HSP7000

7-1-1) Setting Command List

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Font Style and	ESC RS F	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Character Set	ESC GS t	Shared	Valid	Ignored for DBCS setting & for models with Kanji characters	Valid Shared	Ignored for DBCS setting & for models with Kanji characters	Valid Shared	Ignored for DBCS setting & for models with Kanji characters
	ESC GS =	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC R	Shared	Valid		Valid Shared		Valid Shared	
	ESC /	Shared	Valid		Valid Shared		Valid Shared	
	ESC SP	Shared	Valid	Shared with Slip/Validation a Line Mode	Valid For each Line/Page	Line/Page mode settings Independent Line Mode: Shared with Thermal/Validation a Line Mode Page Mode: Sared with Validation a Page Mode	Valid For each Line/Page	Line/Page mode settings Independent Line Mode: Shared with Thermal/Validation a Line Mode Page Mode: Sared with Validation a Page Mode
	ESC M	Shared	Valid	Specify 12 dot pitch	Valid only Line	Line Mode: 7x9 Selection Page Mode: 5x9 Fixed Valid after switch to line mode	Valid only Line	Line Mode: 7x9 Selection Page Mode: 5x9 Fixed Valid after switch to line mode
	ESC P	Shared	Valid	Specify 15 dot pitch	Valid only Line	Line mode: 5x9 (2P-1) selection Page Mode: 5x9 Fixed Valid after switch to line mode	Valid only Line	Line mode: 5x9 (2P-1) selection Page mode: 5x9 Fixed Valid after switch to line mode
	ESC :	Shared	Valid	Specify 16 dot pitch	Valid only Line	Line mode: 5x9 (3P-1) selection Page mode: 5x9 Fixed Valid after switch to line mode	Valid only Line	Line mode: 5x9 (3P-1) selection Page mode: 5x9 Fixed Valid after switch to line mode
	ESC g	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC 6	Shared	Invalid	Two bytes ignored	Invalid	Two bytes ignored	Invalid	Two bytes ignored
	ESC 7	Shared	Invalid	Two bytes ignored	Invalid	Two bytes ignored	Invalid	Two bytes ignored
Character Expansion	ESC i	Shared	Valid	Expanded by parameter n1, n2 After switch slip/validation, fixed at 2x even with expansion enabled	Valid Shared	Fixed at 2x when parameters n1, n2 are higher than 1. Expansion valid by parameter after switch to thermal	Valid Shared	Fixed at 2x when parameters n1, n2 are higher than 1. Expansion valid by parameter after switch to thermal
	ESC W	Shared	Valid	Expanded by parameter n After switch slip/validation, fixed at 2x even with expansion enabled	Valid Shared	Fixed at 2x when parameter is higher than 1. Expansion valid by parameter after switch to thermal	Valid Shared	Fixed at 2x when parameter is higher than 1. Expansion valid by parameter after switch to thermal
	ESC h	Shared	Valid	Expanded by parameter n After switch slip/validation, fixed at 2x even with expansion enabled	Valid Shared	Fixed at 2x when parameter is higher than 1. Expansion valid by parameter after switch to thermal	Valid Shared	Fixed at 2x when parameter is higher than 1. Expansion valid by parameter after switch to thermal
	SO	Shared	Valid		Valid Shared		Valid Shared	
	DC4	Shared	Valid		Valid Shared		Valid Shared	
	ESC SO	Shared	Valid		Valid Shared		Valid Shared	
	ESC DC4	Shared	Valid		Valid Shared		Valid Shared	

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Adornment	ESC E	Shared	Valid		Valid Shared		Valid Shared	
	ESC G	Shared	Invalid	Two bytes ignored	Invalid	Two bytes ignored	Invalid	Two bytes ignored
	ESC F	Shared	Valid		Valid Shared		Valid Shared	
	ESC H	Shared	Invalid	Two bytes ignored	Invalid	Two bytes ignored	Invalid	Two bytes ignored
	ESC -	Shared	Valid		Valid Shared		Valid Shared	
	ESC _	Shared	Valid		Valid Shared		Valid Shared	
	ESC 4	Shared	Valid	Sets white/black inverted printing After switch to slip/ validation, red-black swithing function printing valid	Valid Shared	Sets red/black sub-stitute function Valid After switch to thermal, white-black inversion printing valid	Valid Shared	Sets red/black sub-stitute function Valid After switch to thermal, white-black inversion printing valid
	ESC 5	Shared	Valid	Cancel white/black inverted printing After switch to slip/ validation, red-black swithing function printing canceled	Valid Shared	Cancel white/black inverted printing After switch to slip, red-black swithing function printing canceled	Valid Shared	Cancel white/black inverted printing After switch to validation, red-black swithing function printing canceled
	ESC GS 4	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid Shared		Valid Shared	
	SI	Shared	Valid		Valid only Line	Page mode: Valid after switch to line mode	Valid only Line	Page mode: Valid after switch to line mode
	DC2	Shared	Valid		Valid only Line	Page Mode: Valid after switch to line mode	Valid only Line	Page Mode: Valid after switch to line mode
	ESC RS i	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid only Line	Page mode: Valid after switch to line mode	Valid only Line	Page mode: Valid after switch to line mode
Line spac-ing	ESC z	Independent Station selec-tion command dependent	Valid		Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
	ESC 0	Independent Station selec-tion command dependent	Valid		Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
	ESC 1	Independent Station selec-tion command dependent	Valid		Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
	ESC A	Independent Station selec-tion command dependent	Valid		Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
	ESC 2	Independent Station selec-tion command dependent	Valid		Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
	ESC 3	Independent Station selec-tion command dependent	Invalid	Three bytes ignored	Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
	ESC y	Independent Station selec-tion command dependent	Invalid	Three bytes ignored	Valid For each Line/Page	Line/Page mode settings Independent	Valid For each Line/Page	Line/Page mode settings Independent
Page Control	ESC C	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC C 0	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC c	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC B	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC N	Shared	Invalid	Three bytes ignored	Invalid	Three bytes ignored	Invalid	Three bytes ignored
	ESC O	Shared	Invalid	Two bytes ignored	Invalid	Two bytes ignored	Invalid	Two bytes ignored
Horizontal Direction Position	ESC I	Independent Station selec-tion command dependent	Valid		Valid only Line	Page mode: Valid after switch to line mode	Valid only Line	Page mode: Valid after switch to line mode
	ESC Q	Independent Station selec-tion command dependent	Valid		Valid only Line	Page mode: Valid after switch to line mode	Valid only Line	Page mode: Valid after switch to line mode
	ESC D	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS a	Shared	Valid		Valid only Line	Page mode: Valid after switch to line mode	Valid only Line	Page mode: Valid after switch to line mode

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Download	ESC &	Shared	Valid		Valid Shared	Shared with validation	Valid Shared	Shared with slip
	ESC %	Shared	Valid		Valid Shared		Valid Shared	
Logos	ESC FS q	Shared	Valid		Valid Shared		Valid Shared	
External Drive Device	ESC BEL	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS EM DC1	Shared	Valid		Valid Shared		Valid Shared	
Print Setting	ESC RS d	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC RS r	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Status	ESC RS a	Shared	Valid		Valid Shared		Valid Shared	
Kanji Character	ESC p	Shared	Valid		Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode
	ESC q	Shared	Valid		Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode
	ESC $	Shared	Valid		Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode
	ESC s	Shared	Valid	Shared with Slip/ Validation a Line Mode setting	Valid For each Line/Page	Line/Page mode settings Independent Line Mode: Shared with Validation setting	Valid For each Line/Page	Line/Page mode settings Independent Line Mode: Shared with Validation setting
	ESC t	Shared	Valid	Shared with Slip/ Validation a Line Mode setting	Valid For each Line/Page	Line/Page mode settings Independent Line Mode: Shared with Validation setting	Valid For each Line/Page	Line/Page mode settings Independent Line Mode: Shared with Validation setting
	ESC r	Independent Station selection command dependent	Valid		Valid Shared	Shared with validation	Valid Shared	Shared with slip
	ESC u	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode
	ESC x	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode
	ESC w	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode	Valid Shared	Page Mode: Valid only in double-density page mode For standard mode, valid after switching to double-densitymode/line mode
	ESC U	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid For each Line/Page	Line/Page mode settings Independent Shared with validation	Valid For each Line/Page	Line/Page mode settings Independent Shared with slip
Others	ESC e	Shared	Valid		Valid Shared		Valid Shared	
	ESC f	Shared	Valid		Valid Shared		Valid Shared	

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Macro	ESC GS +	Shared	Valid		Valid Shared		Valid Shared	
Raster Mode	ESC * r E	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r F	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r P	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r Q	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r m l	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r m r	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r T	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC * r K	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
USB Related	ESC # # W	Shared	Valid		Valid Shared		Valid Shared	
2-Color Printing	ESC RS c	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC RS C	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Mark Commands	ESC GS * 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS * 2	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Auto Logo	ESC GS / 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS / 2	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS / 3	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS / 4	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS / 5	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS / 6	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
User ID	ESC GS % 0	Shared	Valid		Valid Shared		Valid Shared	
PDF 417	ESC GS x S 0	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS x S 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS x S 2	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS x S 3	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS x D	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Printer Driver	ESC RS A	Independent Station selection command dependent	Valid		Valid only Line	Page Mode: Valid after switch to line mode	Valid only Line	Page Mode: Valid after switch to line mode
	ESC RS m	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Print Start Trigger	ESC GS g 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
QR Codes	ESC GS y S 0	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS y S 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS y S 2	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS y D 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS y D 2	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Page Function	ESC GS h 0	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
	ESC GS h 1	Shared Only valid for thermal	Valid		Invalid	Valid after switch to thermal	Invalid	Valid after switch to thermal
Slip Function	ESC SI	Shared	Invalid	Three bytes ignored	Invalid	Three bytes ignored	Invalid	Three bytes ignored
	ESC VT	Shared Slip, Validation valid	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC EM	Shared Slip/Validation Valid	Invalid	Valid after switch to slip/validation	Valid Shared		Valid Shared	
	ESC US	Shared Slip, Validation valid	Invalid	Valid after switch to slip/valdation	Valid Shared		Valid Shared	
Page Mode	ESC n	Independent Station selection command dependent	Invalid	Two bytes ignored	Valid only Line	Page Mode: Two bytes ignored	Valid only Line	Page Mode: Two bytes ignored
	ESC !	Independent Station selection command dependent	Invalid	Two bytes ignored	Valid Page only	Line Mode: Two bytes ignored	Valid Page only	Line Mode: Two bytes ignored
	ESC *	Independent Station selection command dependent	Valid	Raster mode related Ten bytes ignored	Valid Page only	Line Mode: Valid after switch to page mode	Valid Page only	Line Mode: Valid after switch to page mode
	ESC T	Independent Station selection command dependent	Invalid	Three bytes ignored	Valid Page only	Line Mode: Valid after switch to page mode	Valid Page only	Line Mode: Valid after switch to page mode
Presenter	ESC SYN 1	Shared	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC SYN 2	Shared	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored

7-1-2) Execution Command List

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Line spacing	LF	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	CR	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	GS	Independent Station selection command dependent	Invalid	One byte ignored	Invalid	One byte ignored	Invalid	One byte ignored
	ESC a	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC J	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC j	Independent Station selection command dependent	Invalid	Three bytes ignored	Valid For each Line/Page		Valid For each Line/Page	
	ESC I	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
Page Control	FF (Line Mode)	Independent Station selection command dependent	Valid		Invalid	One byte ignored	Invalid	One byte ignored
	VT	Independent Station selection command dependent	Valid		Invalid	One byte ignored	Invalid	One byte ignored
Horizontal Direction Position	HT	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC GS A	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC GS R	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC HT	Independent Station selection command dependent	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
Bit Image	ESC K	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC L	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC k	Independent Station selection command dependent	Valid		Invalid	All data for the amount of the counter received and discarded	Invalid	All data for the amount of the counter received and discarded
	ESC X	Independent Station selection command dependent	Valid		Invalid	All data for the amount of the counter received and discarded	Invalid	All data for the amount of the counter received and discarded
	ESC ^	Independent Station selection command dependent	Invalid	All data for the amount of the counter received and discarded	Valid For each Line/Page		Valid For each Line/Page	
Logo	ESC FS p	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	ESC RS L	Independent Station selection command dependent	Valid		Valid only Line	Page Mode: Four bytes ignored	Valid only Line	Page Mode: Four bytes ignored
Bar Codes	ESC b	Independent Station selection command dependent	Valid		Valid only Line	Line Mode: Data received and discarded up to <RS> for unsupported bar codes Page Mode: Data received and discarded up to <RS>.	Valid only Line	Line Mode: Data received and discarded up to <RS> for unsupported bar codes Page Mode: Data received and discarded up to <RS>.
Cutter Control	ESC d	Independent Station selection command dependent	Valid		Invalid	Three bytes ignored	Invalid	Three bytes ignored

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
External Device Drive	BEL	Shared	Valid		Valid Shared		Valid Shared	
	FS	Shared	Valid		Valid Shared		Valid Shared	
	SUB	Shared	Valid		Valid Shared		Valid Shared	
	EM	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS BEL	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS EM DC2	Shared	Valid		Valid Shared		Valid Shared	
Status	ESC ACK SOH	Shared	Valid		Valid Shared		Valid Shared	
	ENQ	Shared	Valid		Valid Shared		Valid Shared	
	EOT	Shared	Valid		Valid Shared		Valid Shared	
	ETB	Shared	Valid		Valid Shared		Valid Shared	
	ESC RS E	Shared	Valid		Valid Shared		Valid Shared	
Others	RS	Shared	Valid		Valid Shared		Valid Shared	
	CAN	Shared	Valid		Valid Shared		Valid Shared	
	ESC @	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS #	Shared	Valid		Valid Shared		Valid Shared	
	ESC # N	Shared	Invalid	Ignored up to <NUL>	Invalid	Ignored up to <NUL>	Invalid	Ignored up to <NUL>
	ESC # @	Shared	Valid		Valid Shared		Valid Shared	
	ESC # N ?	Shared	Valid		Valid Shared		Valid Shared	
	ESC # *	Shared	Valid		Valid Shared		Valid Shared	
	ESC ?	Shared	Valid		Valid Shared		Valid Shared	
	DC3	Shared	Valid		Valid Shared		Valid Shared	
	DC1	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS r	Shared	Valid		Invalid	Six bytes ignored	Invalid	Six bytes ignored
	ESC ETB	Independent Station selection command dependent	Invalid	Three bytes ignored	Valid only Line	Page Mode: Three bytes ignored	Valid only Line	Page Mode: Three bytes ignored
Macro	ESC m	Independent Station selection command dependent	Valid		Valid For each Line/Page		Valid For each Line/Page	
	Initialization Macro	Shared	Valid		Valid Shared		Valid Shared	
Raster Mode	ESC * r R	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC * r A	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC * r B	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC * r C	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Four bytes ignored	Invalid	Four bytes ignored

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Raster Mode	ESC * r D	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	b	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data for the amount of the counter received and discarded	Invalid	Data for the amount of the counter received and discarded
	k	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data for the amount of the counter received and discarded	Invalid	Data for the amount of the counter received and discarded
	ESC * r Y	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
	ESC FF NUL	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Three bytes ignored	Invalid	Three bytes ignored
	ESC FF EOT	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Three bytes ignored	Invalid	Three bytes ignored
	ESC * r N	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data for the amount of the counter received and discarded	Invalid	Data for the amount of the counter received and discarded
	ESC * r V	Independent Station selection command dependent Only valid for thermal	Valid		Invalid	Data received and discarded up to <NUL>.	Invalid	Data received and discarded up to <NUL>.
Mark Commands	ESC GS * 0	Independent Station selection command dependent	Valid		Invalid	All data for the counter received and discarded	Invalid	All data for the counter received and discarded
	ESC GS * W	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS * C	Shared	Valid		Valid Shared		Valid Shared	
Auto Logo	ESC GS / W	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS / C	Shared	Valid		Valid Shared		Valid Shared	
User ID	ESC GS % W	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS % 1	Shared	Valid		Valid Shared		Valid Shared	
	ESC GS % P	Independent Station selection command dependent	Valid		Invalid	Five bytes ignored	Invalid	Five bytes ignored
PDF 417	ESC GS x P	Independent Station selection command dependent	Valid		Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC GS x I	Shared	Valid		Valid Shared	Sends “Error”	Valid Shared	Sends “Error”
Maintenance Counter	ESC GS M	Independent Station selection command dependent	Valid		Valid only Line	Page Mode: Six bytes ignored	Valid only Line	Page Mode: Six bytes ignored
Program Overwrite	ESC GS ?	Shared	Valid		Valid Shared		Valid Shared	
Printer Driver	ESC GS CAN	Shared	Valid		Valid Shared		Valid Shared	
Print Start Trigger	ESC GS g 0	Independent Station selection command dependent	Valid		Invalid	Six bytes ignored	Invalid	Six bytes ignored
QR Codes	ESC GS y P	Independent Station selection command dependent	Valid		Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC GS y I	Shared	Valid		Valid Shared	Sends “Error”	Valid Shared	Sends “Error”

Type	Command	Execution Station Thermal, Slip, Validation	Thermal		Slip		Validation	
			Line	Other Precautions	Line/Page	Other Precautions	Line/Page	Other Precautions
Head Failure Detection	ESC RS #	Independent Station selection command dependent	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
Slip Function	ESC FF	Independent Station selection command dependent	Invalid	Three bytes ignored	Valid Shared		Valid Shared	
Page Mode	FF (Page Mode)	Independent Station selection command dependent	Ignored	One byte ignored	Valid Page only	Line Mode: One byte ignored	Valid Page only	Line Mode: One byte ignored
Staion Switch	ESC + A	Independent Station selection command dependent	Valid		Valid only Line	Page Mode: Six bytes ignored	Valid only Line	Page Mode: Six bytes ignored
Presenter	ESC SYN 0	Shared	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC SYN 3	Shared	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
	ESC SYN 4	Shared	Invalid	Four bytes ignored	Invalid	Four bytes ignored	Invalid	Four bytes ignored
MICR	ESC FS M	Independent Station selection command dependent	Invalid	Five bytes ignored	Valid	Page Mode: Five bytes ignored	Invalid	Five bytes ignored

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