Programming Reference

For printer model:

S84 ex / S86 ex

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The pictures in this manual show the SATO S84-ex printer, unless otherwise stated.

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In this Proguraming Refarence, dip switches for setting is written as DSW, and adjusting volume is written as VR.

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Part 1 Programming Reference

1 List of Commands

The following are the commands specified in the Specification for Command.

Control Commands

No.	Command		Function	On page
5.1	ESC+A	<A>	Start of Data Trasmission	10
5.2	ESC+Z	<Z>	End of Data Trasmission	11
5.3	ESC+Q	<Q>	Print Quantity	12
5.4	ESC+ID	<ID>	Job ID Numbering	13
5.5	ESC+WK	<WK>	Job Name	14

Print Position Commands

No.	Command		Function	On page
6.1	ESC+H	<H>	Horizontal Print Position	15
6.2	ESC+V	<V>	Vertical Print Position	16

Modification Commands

No.	Command		Function	On page
7.1	ESC+P	<P>	Character Pitch	17
7.2	ESC+L	<L>	Enlargement	18
7.3	ESC+PS	<PS>	Proportional Pitch	19
7.4	ESC+PR	<PR>	Release of Proportional Pitch	20
7.5	ESC+%	<%>	Rotation	21
7.6	ESC+F	<F>	Sequential Numbering	22
7.7	ESC+FW	<FW>	Print of Lines and Boxes	23
7.8	ESC+FC	<FC>	Print of Circles	25
7.9	ESC+FT	<FT>	Print of Triangles	26
7.10	ESC+(	<(>	Black and White Reverse Print	27
7.11	ESC+KC	<KC>	Kanji Code	28
7.12	ESC+&	<&>	Registration of Form Overlay	29
7.13	ESC+/	</>	Form Overlay call	30
7.14	ESC+0	<0>	Partial Editing	31
7.15	ESC+WD	<WD>	Partial Copying	32
7.16	ESC+J	<J>	Print of Journal	34
7.17	ESC+RF	<RF>	Call and Print of Font & Logo	35
7.18	ESC+RM	<RM>	Mirror Image	36
7.19	ESC+WN	<WN>	Work Shift Information	38
7.20	ESC+WS	<WS>	Print of Work Shift Information	39
7.21	ESC+CE	<CE>	European Code Page	40
7.22	ECS+KS	<KS>	Kanji Font Type	43

Font Commands

No.	Command		Function	On page
8.1	ESC+XU	<XU>	XU Font (Default Font size:5 x 9 dots)	44
8.2	ESC+XS	<XS>	XS Font (Default Font size:17 x 17 dots)	46
8.3	ESC+XM	<XM>	XM Font (Default Font size:24 x 24 dots)	48
8.4	ESC+XB	<XB>	XB Font (Default Font size:48 x 48 dots)	50
8.5	ESC+XL	<XL>	XL Font (Default Font size:48 x 48 dots)	52
8.6	ESC+OA	<OA>	OCR-A Font	54
8.7	ESC+OB	<OB>	OCR-B Font	56
8.8	ESC+$	<$>	Shape of Outline Font	58
8.9	ESC+$=	<$=>	Print of Outline Font	59
8.10	ESC+RD	<RD>	CG Font	61
8.11	ESC+K1	<K1>	16 x 16 dots Horizontal Writing Kanji	65
8.12	ESC+K2	<K2>	24 x 24 dots Horizontal Writing Kanji	66
8.13	ESC+K8	<K8>	16 x 16 dots Horizontal Writing Kanji with One-byte Characters	67
8.14	ESC+K9	<K9>	24 x 24 dots Horizontal Writing Kanji with One-byte Characters	68
8.15	ESC+k1	<k1>	16 x 16 dots Vertical Writing Kanji	69
8.16	ESC+k2	<k2>	24 x 24 dots Vertical Writing Kanji	70
8.17	ESC+k8	<k8>	16 x 16 dots Vertical Writing Kanji with One-byte Characters	71
8.18	ESC+k9	<k9>	24 x 24 dots Vertical Writing Kanji with One-byte Characters	72
8.19	ESC+T1	<T1>	Registration of 16 x 16 dots External Characters	73
8.20	ESC+T2	<T2>	Registration of 24 x 24 dots External Characters	75
8.21	ESC+K1(K2)	<K1(K2)>	Call of Horizontal Writing External Character	77
8.22	ESC+k1(k2)	<k1(k2)>	Call of Vertical Writing External Character	78

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8.23	ESC+U	<U>	U Font (Default Font size:5X9 dots)	79
8.24	ESC+S	<S>	S Font (Default Font size:8X15 dots)	83
8.25	ESC+M	<M>	M Font (Default Font size:13X20 dots)	83
8.26	ESC+WB	<WB>	WB Font (Default Font size:18X30 dots)	85
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Barcode Commands

No.	Command		Function	On page
9.1	ESC+B	<B>	Barcode (Ratio 1:3)	93
9.2	ESC+D	<D>	Barcode (Ratio 1:2)	95
9.3	ESC+D to ESC+d	<D>~<d>	Barcode (Selection of HRI)	97
9.4	ESC+BD	<BD>	Barcode (Ratio 2:5)	98
9.5	ESC+BT	<BT>	Registration of Barcode Width Ratio	100
9.6	ESC+BW	<BW>	Print of Barcode with Registered Ratio	101
9.7	ESC+BI	<BI>	GS1-128(UCC/EAN 128) (Standard Carton ID Only)	104
9.8	ESC+BC	<BC>	CODE 93 Barcode	106
9.9	ESC+BG	<BG>	CODE 128 (128A,128B,128C) Barcode	108
9.10	ESC+BP	<BP>	POSTNET	112
9.11	ESC+BF	<BF>	UPC Add-on Code(BOOKLAND)	114
9.12	ESC+BL	<BL>	UPC-A Barcode (Without HRI)	116
9.13	ESC+BL to ESC+d	<BL>~<d>	UPC-A Barcode (Selection of HRI)	117
9.14	ESC+BM	<BM>	UPC-A Barcode (With HRI)	119
9.15	ESC+EU	<EU>	Composite Symbol	120
9.16	ESC+BS	<BS>	USPS Barcode	124

2D Code Commands

No.	Command		Function	On page
10.1	ESC+2D10	<2D10>	PDF417	126
10.2	ESC+2D12	<2D12>	Micro PDF417	129
10.3	ESC+2D20	<2D20>	MAXI Code	132
10.4	ESC+2D30	<2D30>	QR Code (Model 2)	134
10.5	ESC+2D31	<2D31>	QR Code (Model 1)	138
10.6	ESC+2D32	<2D32>	Micro QR Code	141
10.7	ESC+2D50	<2D50>	Datamatrix (ECC200)	166
10.8	ESC+2D51	<2D51>	GS1 Datamatrix	169
10.9	ESC+BQ	<BQ>	QR Code(Compatible commands)	172
10.10	ESC+BV	<BV>	Maxi Code(Compatible commands)	197
10.11	ESC+BK	<BK>	PDF417(Compatible commands)	199
10.12	ESC+BX	<BX>	Datamatrix (ECC200) (Compatible commands)	202
10.13	ESC+DC	<DC>	Datamatrix (ECC200) Data (Compatible commands)	203
10.14	ESC+FX	<FX>	Datamatrix (ECC200) Sequential Numbering(Compatible commands)	204

Graphic Commands

No.	Command		Function	On page
11.1	ESC+G	<G>	Print of Graphic	206
11.2	ESC+GM	<GM>	Print of BMP File	207
11.3	ESC+GP	<GP>	Print of PCX File	208

System Commands

No.	Command		Function	On page
12.1	ESC+CS	<CS>	Print Speed	209
12.2	ESC+#F	<#F>	Print Darkness	211
12.3	ESC+A1	<A1>	Label Size	212
12.4	ESC+A3	<A3>	Base Offset settingt	214
12.5	ESC+EP	<EP>	Print End Position	215
12.6	ESC+*	<*>	Clear	216
12.7	ESC+@	<@>	Offline	217
12.8	ESC+C	<C>	Reprint	218
12.9	ESC+PG	<PG>	Registration of Printer Operation	219
12.10	ESC+PC	<PC>	Registration of Printer Operation	222
12.11	ESC+E	<E>	Auto Linefeed	225
12.12	ESC+KM	<KM>	Kanji Mincho	226
12.13	ESC+KG	<KG>	Kanji Gothic	227
12.14	ESC+LD	<LD>	User Download	228
12.15	ESC+PO	<PO>	Offset	229
12.16	ESC+#J	<#J>	Job Modification	230

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Memory Card Commands

No.	Command		Function	On page
13.1	ESC+CC	<CC>	Card Slot for Use	231
13.2	ESC+&S	<&S>	Registration of Form Overlay	232
13.3	ESC+&R	<&R>	Form Overlay Call	235
13.4	ESC+YS	<YS>	Registration of Format	236
13.5	ESC+/N	</N>	Registration of Field	238
13.6	ESC+YR	<YR>	Format Call	239
13.7	ESC+/D	</D>	Print of Field	240
13.8	ESC+GI	<GI>	Registration of Graphic	241
13.9	ESC+GR	<GR>	Graphic Call	243
13.10	ESC+GT	<GT>	Registration of BMP File	244
13.11	ESC+GC	<GC>	BMP File Call	245
13.12	ESC+PI	<PI>	Registration of PCX File	246
13.13	ESC+PY	<PY>	PCX File Call	247
13.14	ESC+T1	<T1>	Memory Card 16x16 dots External Font Registration	248
13.15	ESC+T2	<T2>	Memory Card 24x24 dots External Font Registration	249
13.16	ESC+K1 ESC+K2	<K1> <K2>	Memory Card Horizontal Writing External Character Recall	251
13.17	ESC+k1 ESC+k2	<k1> <k2>	Memory Card Vertical Writing External Character Recall	252
13.18	ESC+BJF	<BJF>	Memory Card Initialization	253
13.19	ESC+BJS	<BJS>	Memory Card Status	254
13.20	ESC+*	<*>	Memory Card Clear	255
13.21	ESC+BJ ESC+BJD	<BJ> <BJD>	Registration of True Type Font	256
13.22	ESC+BJT	<BJT>	True Type Font Call	257

Calendar Commands

No.	Command		Function	On page
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14.2	ESC+WP	<WP>	Calendar Addition	259
14.3	ESC+WA	<WA>	Calendar Print	260
14.4	ESC+WU	<WU>	Extended Calendar Print	263
14.5	ESC+WV	<WV>	Calendar Case Format	265
14.6	ESC+CV	<CV>	Calendar M(Month) and D(Day) Code	266

Intelligent Commands

No.	Command		Function	On page
15.1	ESC+IK	<IK>	Media Feed Control	267
15.2	ESC+IM	<IM>	Displayed Messages	269
15.3	ESC+IF	<IF>	Internal Buffer Registration	270
15.4	ESC+IB	<IB>	Internal Buffer Recall	271
15.5	ESC+IC	<IC>	Internal Buffer Data Comparison	273
15.6	ESC+I*	<I*>	Internal Buffer Data Print	274
15.7	ESC+I#	<I#>	Exclusive Key Start-End	275
15.8	ESC+IZ	<IZ>	Key Input	277
15.9	ESC+IR	<IR>	Internal Buffer Registration (Received Data)	278
15.10	ESC+IT	<IT>	Data Sending	280
15.11	ESC+IO	<IO>	External Signal Input / Output	282
15.12	ESC+IW	<IW>	Print Start Waiting Time	284
15.13	ESC+IU	<IU>	Internal Buzzer Sound	285
15.14	ESC+I@	<I@>	Internal Buffer Initialization	286
15.15	ESC+IY	<IY>	Exclusive Display Start-End	287

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2 Initial Value of Operation Settings

The initial values of operation setting are as follows:

[S84-ex]

Item	8 dots/mm	12 dots/mm	24dots/mm
Print speed	6 inch/s Range: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16	6 inch/s Range: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	4 inch/s Range: 2, 3, 4, 5, 6
Range of print darkness	A	A	A
Print darkness	6 Range: 1, 2, 3, 4, 5,6,7,8,9,10	6 Range: 1, 2, 3, 4, 5,6,7,8,9,10	6 Range: 1, 2, 3, 4, 5,6,7,8,9,10
Start point correction	+ 0	+ 0	+0
Designation of proportional pitch	Proportional pitch	Proportional pitch	Proportional pitch

[S86-ex]

Item	8 dots/mm	12 dots/mm
Print speed	6 inch/s Range: 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14,	6 inch/s Range: 4, 5, 6, 7, 8, 9, 10, 11, 12,
Range of print darkness	A	A
Print darkness	5 Range: 1, 2, 3, 4, 5,6,7,8,9,10	5 Range: 1, 2, 3, 4, 5,6,7,8,9,10
Start point correction	+ 0	+ 0
Designation of proportional pitch	Proportional pitch	Proportional pitch

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3 List of Fonts

When using the internal fonts, specify ESC + Font Type command.

Font name	Font Type		Pitch
OCR-A (8dots/mm)	Bitmap [OCR-A font]	15×22dots	Fixed
OCR-B (8dots/mm)	Bitmap [OCR-B font]	20×24dots	Fixed
OCR-A (12dots/mm)	Bitmap [OCR-A font]	22×33dots	Fixed
OCR-B(12dots/mm)	Bitmap [OCR-B font]	30×36dots	Fixed
OCR-A (24dots/mm)	Bitmap [OCR-A font]	44×66dots	Fixed
OCR-B (24dots/mm)	Bitmap [OCR-B font]	60×72dots	Fixed
XU	Bitmap [Helvetica]	5× 9dot	Fixed/Proportional
XS	Bitmap [Universe Condensed Bold]	17×17dot	Fixed/Proportional
XM	Bitmap [Universe Condensed Bold]	24×24dot	Fixed/Proportional
XB	Bitmap [Universe Condensed Bold]	48×48dot	Fixed/Proportional
XL	Bitmap [Sans Serif]	48×48dot	Fixed/Proportional
U	Bitmap [U font]	5×9dots	Fixed
S	Bitmap [S font]	8×15dots	Fixed
M	Bitmap [M font]	13×20dots	Fixed
WB	Bitmap [WB font]	18×30dots	Fixed
WL	Bitmap [WL font]	28×52dots	Fixed
K1(k1)	Bitmap " Simplified Chinese", "Korean"	16x16dots	Fixed
K2(k2)	Bitmap "Simplified Chinese", "Traditional Chinese", "Korean"	24x24dots	Fixed
K8(k8)	Bitmap "Traditional Chinese", "Korean"	16x16dots	Fixed
K9(k9)	Bitmap "Simplified Chinese", "Traditional Chinese", "Korean"	24x24dots	Fixed
$ (Designation of shape) $ (Designation of shape)	Outline font		Fixed/Proportional
RD	CG font [CG Times]		Fixed/Proportional
	CG font [CG Triumvirate]		Fixed/Proportional
	SATOVICA		Fixed/Proportional
	SATOGAMMA		Fixed/Proportional
RG	Thai, Arabic		Fixed

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Font Enlargement

Internal font can be enlarged up to 36.
For instance, if the standard font of W5(dots) x H9(dots) multiplied by 3 = W15(dots) x H27(dots).
Parameter writing method of printed character is as follows.

Width x Enlargement rate = Width parameter setting value
Height x Enlargement rate = Height parameter setting value
Enlargement specification <L> controls font size so that the parameter can be specified in ratio.
If specifying <L> 0304, the font size will be enlarged 3 times the width and 4 times the height from its standard size.
In this case, character pitch will be automatically widened.

Fixed Pitch and Proportional Pitch

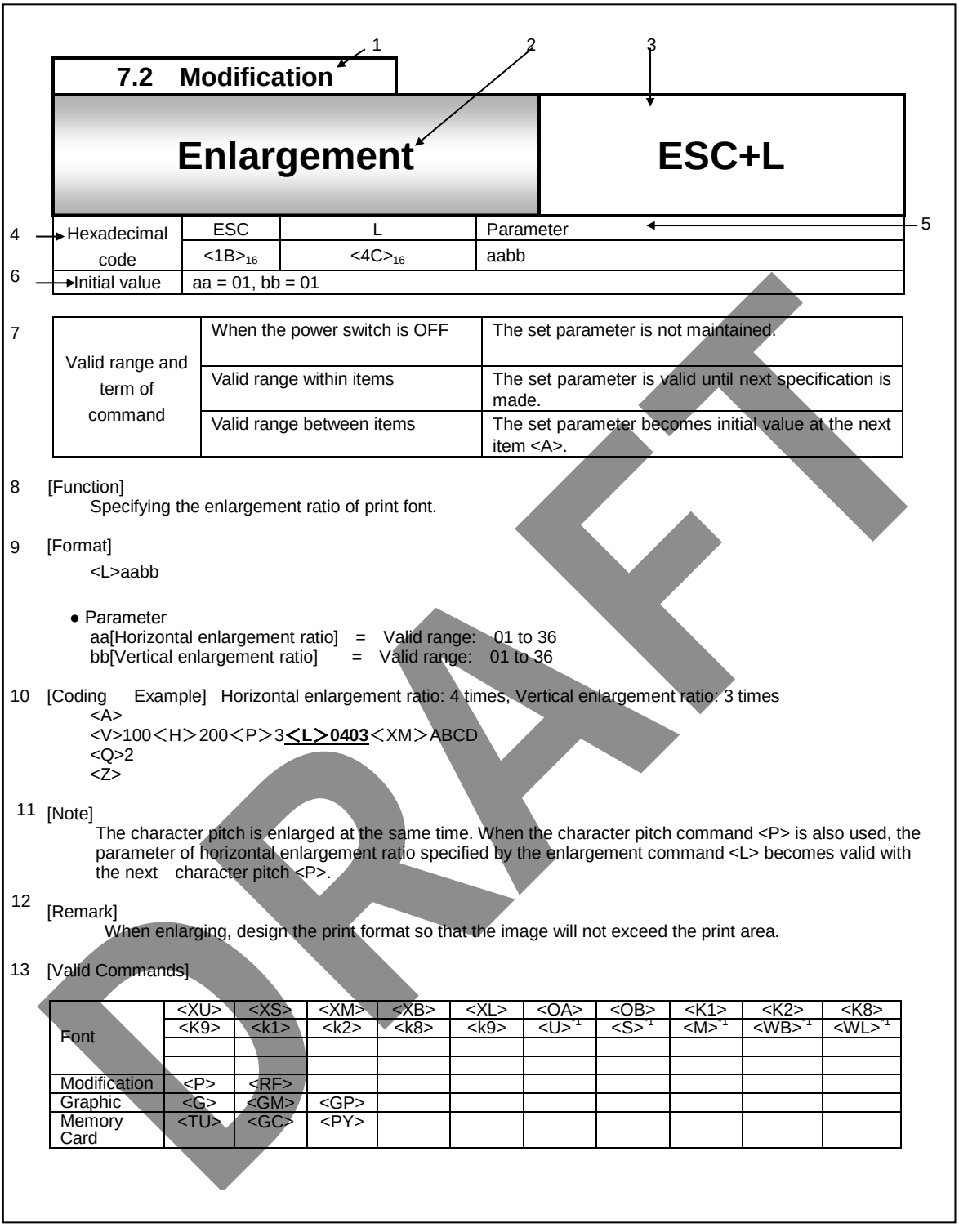
Print of Fixed Pitch and Proportional Pitch are available for XU ~ XL fonts, Outline font, and CG font.
To select Proportional Pitch, specify Proportional Pitch <PS> or Release of Proportional Pitch <PR>, or go to the USER Mode of printer LCD.
Proportional pitch may vary depending on the font type.
Fixed pitch will be adjusted to the width of characters based on the individual font size.

Difference between Outline Font and Bitmap Font

For Bitmap font, its height and width are already fixed and featured in the printer. The actual height of bitmap font is slightly larger than its width.
Bitmap font is the largest size of font matrix.
For the type and size of font, see the list above.
Outline font, when the height and width are set correctly, can create a font mostly well-balanced, which is done by meansof a function of smooth-scaling algorithm in the printer. Different font styles, such as outline characters, characterdecoration, and shaded italic, can also be selected.

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4 Example of Command Reference



1 2 3

7.2 Modification

Enlargement | **ESC+L**

4 Hexadecimal code	ESC	L	Parameter (5)
	$<1B>_{16}$	$<4C>_{16}$	aabb
6 Initial value	aa = 01, bb = 01		

7

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within items	The set parameter is valid until next specification is made.
	Valid range between items	The set parameter becomes initial value at the next item <A>.

8 [Function]
Specifying the enlargement ratio of print font.

9 [Format]
<L>aabb

● Parameter
aa[Horizontal enlargement ratio] = Valid range: 01 to 36
bb[Vertical enlargement ratio] = Valid range: 01 to 36

10 [Coding Example] Horizontal enlargement ratio: 4 times, Vertical enlargement ratio: 3 times
<A>
<V>100＜H＞200＜P＞3**＜L＞0403**＜XM＞ABCD
<Q>2
<Z>

11 [Note]
The character pitch is enlarged at the same time. When the character pitch command <P> is also used, the parameter of horizontal enlargement ratio specified by the enlargement command <L> becomes valid with the next character pitch <P>.

12 [Remark]
When enlarging, design the print format so that the image will not exceed the print area.

13 [Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<K1>	<K2>	<K8>
	<K9>	<k1>	<k2>	<k8>	<k9>	<U>*1	<S>*1	<M>*1	<WB>*1	<WL>*1
Modification	<P>	<RF>								
Graphic	<G>	<GM>	<GP>							
Memory Card	<TU>	<GC>	<PY>							

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1. Command classification
There are "Control", "Print position", "Modification", "Font", "Barcode", "2D code", "Graphics", "System", "Memory card", "Enhanced function", and "Calendar."

2. Command name

3. Command code

4. Command in HEX code

5. Parameter added to the command

6. Command default

7. Command valid range

- When the power switch is OFF
  - (1) The set parameter is maintained.
  - (2) The set parameter is not maintained.
  - (3) The set command is not maintained.

- Valid range within item
  - (1) The set parameter is in effect until a new specification is made.
  - (2) The parameter preset will be invalid.
  - (3) The set command becomes invalid.

- Valid range between items
  - (1) The set parameter becomes the default value with the next item <A>.
  - (2) The set parameter is in effect until a new specification is made.
  - (3) The set parameter becomes invalid.
  - (4) The set command becomes invalid.

8. Command function overview

9. Command and necessary parameter

<L>AABB means ESC+L(<1B>$_{16}$<4C>$_{16}$) and 2 kinds of parameter AA and BB.

10. Command coding examples

The below is when the coding example is output via RS-232C to the printer in BASIC language programing:

```
 10  ESC$=CHR$(&H1B)
 20  OPEN  "COM1:9600, N, 8, 1, RS, BIN"  FOR OUTPUT AS #1
 30  PRINT  #1, ESC$ ; "A" ;
 40  PRINT  #1, ESC$ ; "V100" ; ESC$ ; "H200" ;
 50  PRINT  #1, ESC$ ; "P3" ; ESC$ ; "L0403" ;
 60  PRINT  #1, ESC$ ; "XMABCD" ;
 70  PRINT  #1, ESC$ ; "Q2" ;
 80  PRINT  #1, ESC$ ; "Z" ;
 90  CLOSE  #1
100  END
```

11. Supplemental explanation of command function and parameter

12. Remarks or restrictions when using the command

13. Commands affected by using the command

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5 Control Command

5.1 Control

Start of Data Transmission	ESC+A

Hexadecimal code	ESC	A	Parameter
	$<1B>_{16}$	$<41>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]

Specifying the start of data transmission.

[Format]

<A>

[Coding Example]

<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Notes]

1. Indicates the start of the item and to be placed at the head of the item.
2. Use <A> and End of Data Transmission <Z> as a set of commands.

[Remarks]

1. Setting value of all commands excluding a part of system commands will be set to default.
2. If not specified this command, printing will not be performed.

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5.2 Control

End of Data Transmission

ESC+Z

Hexadecimal code	ESC	Z	Parameter
	$<1B>_{16}$	$<5A>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between items	The set command becomes invalid.

[Function]
Specifying the end of data transmission.

[Format]
<Z>

[Coding Example]
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<u><Z></u>

[Notes]
1. Indicates the end of the item and to be placed at the tail of the item.
2. Use Start of Data Transmission <A> and <Z> as a set of commands.

[Remark]
If not specified this command, printing will not be performed.

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5.3 Control

Print Quantity

ESC+Q

Hexadecimal code	ESC	Q	Parameter
	$<1B>_{16}$	$<51>_{16}$	aaaaaa
Initial value	aaaaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying the number of labels to print.

[Format]
<Q>aaaaaa

●Parameter
a[Number of labels to print] = Valid range: 1 to 999999

[Coding Example] Number of labels: 2
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Notes]
1. Print contents specified by Start of Data Transmission <A> and End of Data Transmission <Z> are regarded as 1 label, and the number of reprints can be specified.
2. Use this command prior to End of Data Transmission <Z>.

[Remark]
The reprint will be performed based on the specified print quantity. If specifying Sequential Numbering <F>, the value of sequential number that was set up for that field portion will print.

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5.4 Control

Job ID Number

ESC+ID

Hexadecimal code	ESC	ID	Parameter
	$<1B>_{16}$	$<49>_{16}<44>_{16}$	aa
Initial value	a=$<20>_{16}$		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying job ID number for status return.

[Format]

<ID>aa

●Parameter

a[Job ID number] = Valid range: 00 to 99

[Coding Example] Job ID number: 01

<A>
<ID>01
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<Q>2
<Z>

[Notes]

1. When a status return is used for communication protocol, the specified job ID No. can be set to the telegraphic status.
2. Status can be confirmed sending status request (ENQ).
3. Include this command within an item and use when printing by Start of Data Transmission <A> ~ End of Data Transmission <Z>.
4. The valid range of the job ID is "0000 - 9999" and "*****" when using Status 5. When "*****" is specified,the item is not controlled by the job ID number.

[Remarks]

1. In status return communication protocol, this command becomes valid when a status request (ENQ) is received while printing (Including when QTY≠0, Offline and Error).
2. In status return communication protocol, if status request (ENQ) is received when printing is not in progress (QTY=0, No received data when power is ON), space (20H) will be set to status and returned.
3. When Job ID Number <ID> is used more than twice within the items of <A> and <Z>, the last specified value becomes valid.
4. For more information, refer to the “Interface Specifications”

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5.5 Control

Job Name	ESC+WK

Hexadecimal code	ESC	WK	Parameter
	<1B>16	<57>16<4B>16	aaaaaaaaaaaaaaaa
Initial value	aaaaaaaaaaaaaaaa =<20>16		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying a job name for status return.

[Format]

<WK>aaaaaaaaaaaaaaaa

●Parameter

a[Job Name] = ASCII code 16-digit, Shift JIS Kanji 8-digit

[Coding Example] Job name: SATO

<A>
<ID>01
<WK>SATO
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<Q>2
<Z>

[Notes]

1. When Status4 is used for communication protocol, specified job name can be set to the telegraphic status.
2. Status can be confirmed sending status request (ENQ).
3. Include this command within an item and use when printed by Start of Data Transmission <A> ~ End of Data Transmission <Z>.
4. This command can be used in combination with Job ID Number <ID>.

[Remarks]

1. In status return communication protocol, this command becomes valid when a status request (ENQ) is received while printing (Including when QTY≠0, Offline and Error).
2. In status return communication protocol, if status request (ENQ) is received when printing is not in progress (QTY=0, No received data when power is ON), space (20H) will be set to status and returned.
3. When this command is used more than twice within the item of <A> and <Z>, the last specified value becomes valid.
4. For more information, refer to the “Interface Specifications”.
5. If assigning over 17 characters to a job name, the excess characters are ignored.

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6 Print position command

6.1 Print Position

Horizontal Print Position	ESC+H

Hexadecimal code	ESC	H	Parameter
	$<1B>_{16}$	$<48>_{16}$	aaaa
Initial value	aaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]
Specifying horizontal print position from its start point by dot.

[Format]
<H>aaaa

●Parameter
a[Horizontal Print Position] = Refer to the table below.

[Coding Example] Horizontal print position: 200 dots
<A>
<V>100**<H>200**<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Note]
Specifying the start of the horizontal position for the printing of text, barcode, ruled line and graphic.

[Remarks]
1. Any contents such as text, barcode, graphic exceed the printable area will not print.
2. When specifying “0” for print position, the operation is the same as when setting to “1”.

[Initial Value and Valid Range of Parameter]
[S84-ex]

Head density	Initial value	Valid range (dots)
8dots/mm (203 dpi)	1	1 to 832
12dots/mm (305 dpi)	1	1 to 1248
24dots/mm (609 dpi)	1	1 to 2496

[S86-ex]

Head density	Initial value	Valid range (dots)
8dots/mm (203 dpi)	1	1 to 1340
12dots/mm (305 dpi)	1	1 to 2010

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>
	<WB>	<WL>	<RG>							
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>					
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>	<2D33>
	<2D50>	<BX>	<2D51>							
Composite symbol	<EU>									
Modification	<WD>	<FW>	<(>	<RF>	<FC>	<FT>	<RM>	<%A>	<WS>	
Graphic	<G>	<GM>	<GP>							
Memory card	<GR>	<GC>	<PY>							

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6.2 Print Position

Vertical Print Position — ESC+V

Hexadecimal code	ESC	V	Parameter
	$<1B>_{16}$	$<56>_{16}$	aaaaa
Initial value	aaaaa=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]
Specifying vertical print position from its start point by dot.

[Format]
<V>aaaaa

●Parameter
a[Vertical Print Position] = Refer to the table below.

[Coding Example] Vertical print position: 100 dots
<A>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Notes]
1. Specifying the start of vertical position for the printing of text, barcode, ruled line and graphics.
2. When specifying “0” for print position, the operation is the same as when setting to “1”.

[Remark]
Any contents such as text, barcode and graphic exceed the printable area will not print.

[Initial Value and Valid Range of Parameter]
[S84-ex]

Head density	Initial value	Valid range (dots)
8dots/mm (203 dpi)	1	1 to 20000
12dots/mm (305 dpi)	1	1 to 18000
24dots/mm (609 dpi)	1	1 to 9600

[S86-ex]

Head density	Initial value	Valid range (dots)
8dots/mm (203 dpi)	1	1 to 9992
12dots/mm (305 dpi)	1	1 to 14988

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>
	<WB>	<WL>	<RG>							
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>					
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>	<2D33>
	<2D50>	<BX>	<2D51>							
Composite symbol	<EU>									
Modification	<WD>	<FW>	<(>	<RF>	<FC>	<FT>	<RM>	<%A>	<WS>	
Graphic	<G>	<GM>	<GP>							
Memory card	<GR>	<GC>	<PY>							

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7 Modification Command

7.1 Modification

Character Pitch	ESC+P

Hexadecimal code	ESC	P	Parameter
	$<1B>_{16}$	$<50>_{16}$	aa
Initial value	aa=02		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]
Specifying character pitch by dot.

[Format]
<P>aa

●Parameter
a[Character pitch] = Valid range: 00 to 99 dots

[Coding Example] Character pitch: 10
<A>
<V>100<H>200**<P>10**<L>0202<XM>ABCD
<Q>2
<Z>

[Notes]
1. Character pitch means the character gap or font gap when selecting font or barcode.
2. The specified character pitch will be widened based on the ratio of Enlargement <L>.
3. The character pitch command <P> maintains the parameter only in the field. However, when line feed code "CR" is specified by auto line feed command <E>, the parameter is maintained between the fields. This is defaulted back with the data start command <A>.
4. By specifying Character Pitch <P> just before the barcode specification, pitch command becomes valid for barcode module.
   Object barcode: NW-7, CODE39, Industrial 2 of 5, Matrix 2 of 5
   For more information, see (3) Intercharacter Gap in [9 **Barcode Specification**].
5. Data specification except numeric value or specification of over-digit will give the initial value.

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>
	<WB>	<WL>								
Barcode	<B>	<D>	<D><d>	<BD>	<BT>	<BW>	<BM>			
Modification	<RF>									

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7.2 Modification

Enlargement	ESC+L

Hexadecimal code	ESC	L	Parameter
	<1B>16	<4C>16	aabb
Initial value	aa=01、bb=01		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]
Specifying the enlargement ratio of the font.

[Format]
<L>aabb

●Parameter
a[Horizontal enlargement ratio] = Valid range: 01 to 36
b[Vertical enlargement ratio] = Valid range: 01 to 36

[Coding Example] Horizontal enlargement ratio: 4 times, Vertical enlargement ratio: 3 times
<A>
<V>100<H>200<P>3**<L>0403**<XM>ABCD
<Q>2
<Z>

[Note]
Enlarges the intercharacter pitch as well. When Character Pitch <P> is used at the same time, the parameter value of the horizontal enlargement ratio specified in Enlargement <L> will be reflected in the subsequent specification <P>.

[Remark]
If increasing the enlargement ratio, design the print format that does not exceed print area.

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<K1>	<K2>	<K8>
	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>	<WB>	<WL>
Modification	<P>	<RF>								
Graphic	<G>	<GM>	<GP>							
Memory card	<GR>	<GC>	<PY>							

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7.3 Modification

Proportional Pitch	ESC+PS

Hexadecimal code	ESC	PS	Parameter
	$<1B>_{16}$	$<50>_{16}<53>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]

Specifying the proportional pitch.

[Format]

<PS>

[Coding Example]

<A>
<PS>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Notes]

1. If specifying this command, width of alphanumeric becomes narrower than the time when <PS> was not specified.
2. If setting data other than specified, proportional print will not be performed.
3. In the printer initial state, [Proportional Pitch] is set to default. Go to the Advanced Mode of the printer LCD display when selecting the default setting value (Fixed/Proportional).

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<RD>	<$=>			
Modification	<RF>									

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7.4 Modification

Release of Proportional Pitch	ESC+PR

Hexadecimal code	ESC	PR	Parameter
	$<1B>_{16}$	$<50>_{16}<52>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]

Specifying the release of proportional pitch.

[Format]

<PR>

[Coding Example]

<A>
<PR>
<V>100<H>200<P>2<L>0202<XM>ABCD
<Q>2
<Z>

[Note]

The default status of the printer is set to "Proportional pitch". The setting(Fix/Proportional) can be changed in the advanced mode of the printer LCD.

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<RD>	<$=>			
Modification	<RF>									

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7.5 Modification

Rotation	ESC+%

Hexadecimal code	ESC	%	Parameter
	$<1B>_{16}$	$<25>_{16}$	a
Initial value	a=0		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]

Specifying the counter-clockwise rotation of font and barcode. This is to rotate the print direction in 90º increments without changing the location of the base reference point.

[Format]

<%>a

●Parameter

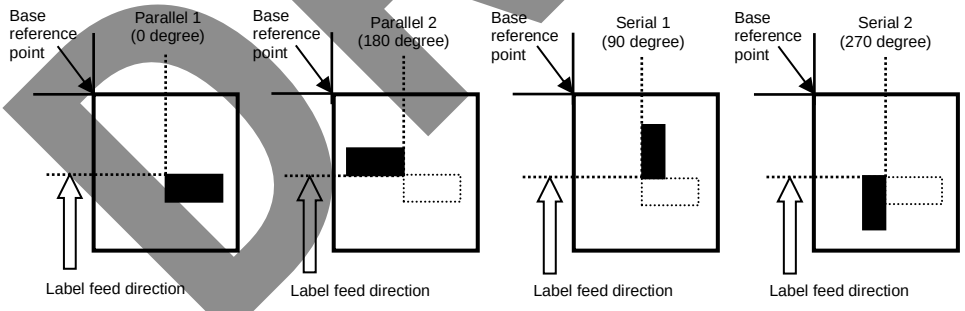
a[Rotative direction] = 0: Parallel 1 (0 degree)
1: Serial 1 (90-degree)
2: Parallel 2 (180-degree)
3: Serial 2 (270-degree)

[Coding Example] Font rotation: 180-degree, Barcode rotation: Parallel 1

<A>
<%>2
<V>100<H>400<P>3<L>0403<XM>ABCD
<%>1
<V>400<H>200<BD>103160*123*
<Q>2
<Z>

[Notes]

1. Position specification of Vertical Print Position <V> and Horizontal Print Position <H> are the absolute value from its base reference point.
2. When the value of the parameter a is set to 4 to 9, the command error occurs and the command is ignored. When other than number is specified, it is also ignored and the image is printed with Parallel 1(0 degree).
3. When printing with Serial 1(90 degrees) or Serial 2(270 degrees), design the narrow bar of the barcode bigger because it may be blurred. When printing with Serial 1(90 degrees) and Serial 2(270 degrees), slow down the print speed.



[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>
	<WB>	<WL>	<RG>							
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>					
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>	<2D33>
	<2D50>	<BX>	<2D51>							
Composite symbol	<EU>									
Graphic	<G>	<GM>	<GP>							
System	<E>									
Modification	<RF>	<FW>	<FC>	<FT>	<(>	<RM>	<WS>			
Memory card	<GR>	<GC>	<PY>							

*1 Closed to the users

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7.6 Modification

Sequential Numbering — ESC+F

Hexadecimal code	ESC	F	Parameter
	$<1B>_{16}$	$<46>_{16}$	aaaabcccc(,dd,ee,f)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Printing sequential fields (text, barcode) where all incrementing is done within the printer.

[Format]

<F>aaaabcccc(,dd,ee,f)

●Parameter

a[Number of times to repeat the same data] = 1 to 9999

b[Plus or minus symbol] = + :for increments

= - :for decrements

c[Value of step for sequence] = 1 to 9999

d[Sequential numbering digit quantity] = 1 to 99 : If digits are omitted, 8 is default.

e[Number of digits free from sequential numbering] = 0 to 99 : Starting with the rightmost position. If digits are left out, the default is 0.

f[Decimal/Hex sequential numbering] = 0 : Decimal number. If digits are left out, the default is 0 (zero)

1 : Hexadecimal

[Coding Example] Number of times to repeat the same data: 1, Plus or minus symbol: +
Value of step for sequence: 1, Sequential numbering digit quantity: 5
Number of digits free from sequential numbering: 0

```
<A>
<V>100<H>100<P>2<L>0202
<F>1+1,5,0<XU>10000
<Q>2
<Z>
```

[Notes]

1. Up to eight different sequential fields can be specified per label.
2. The print data just after the sequential numbering command <F> is the default value of the sequential numbering data.
3. Specify digits more than sequential numbering digit quantity for the sequential numbering data. When this fails, the sequential numbering may not be printed correctly.
4. The sequential numbering and inverse printing command <(> cannot be used together.
5. Auto Linefeed <E> is not available.
6. Font or barcode is necessary to be printed in order to implement sequential numbering print.
7. The sequential numbering digit quantity and the digit of data specify command for the font or barcode are needed to be matched.
   When this fails, the sequential numbering cannot be implemented.
8. When the print data just after the sequential numbering <F> is sequential numbering invalid command, the sequential numbering will be ignored.

[Valid Commands]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<U>
	<S>	<M>	<WB>	<WL>						
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>					

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7.7 Modification

Print of Lines and Boxes

ESC+FW

Hexadecimal code	ESC	FW	Parameter
	$<1B>_{16}$	$<46>_{16}<57>_{16}$	Ruled line: aabccccc(Peeeeeeee) Closing line: aabbVcccccHddddd(Peeeeeeee)
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Printing horizontal lines, vertical lines, and boxes as images on the label.

[Format]

<FW>aabccccc(Peeeeeeee) Print of lines

●Parameter

a[Line width]	=	Valid range	:	02 to 99 dots
b[Specification of horizontal/vertical direction]	=	H	:	Horizontal line
	=	V	:	Vertical line
c[Length of line in dots]	=	Valid range	:	Refer to the table below.
e[Line pattern]	=	Valid range	:	01 to FFFFFFFF (omissible)

<FW> aabbVcccccHddddd(Peeeeeeee) Print of boxes

●Parameter

a[Vertical line width]	=	Valid range	:	02 to 99 dots
b[Horizontal line width]	=	Valid range	:	02 to 99 dots
c[Vertical line length]	=	Valid range	:	Refer to the table below.
d[Horizontal line length]	=	Valid range	:	Refer to the table below.
e[Line pattern]	=	Valid range	:	01 to FFFFFFFF (omissible)

[Coding Example 1]

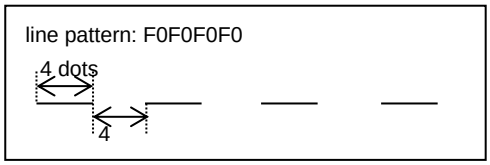
Lines [Line width: 4], [Specification of Horizontal direction], [Length of line in dots: 400]
Boxes [Vertical line width: 8], [Horizontal line width: 8], [Vertical line length: 300], [Horizontal line length: 400]

<A>
<V>100<H>200**<FW>04H400**
<V>300<H>200**<FW>0808V300H400**
<Q>2
<Z>

[Coding Example 2]

Lines [Line width: 4], [Specification of Horizontal direction], [Length of line in dots: 400], line pattern: F0F0F0F0
Boxes [Vertical line width: 8], [Horizontal line width: 8], [Vertical line length: 300], [Horizontal line length: 400], line pattern: F0F0F0F0

<A>
<V>100<H>200**<FW>04H400PF0F0F0F0**
<V>300<H>200**<FW>0808V300H400PF0F0F0F0**
<Q>2
<Z>



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[Notes]

1. When the print start position is outside of the printable area, printing will not be performed due to command error.
2. Specify the line width of the horizontal direction for more than 0.166mm according to the list below.

Head density	Line width
8dots/mm (203dpi)	More than 2 dots
12 dots/mm (305dpi)	More than 2 dots
24 dots/mm (609dpi)	More than 4 dots

3. In case of the ruled line, when the line width of the vertical line is widened, the right side against the feed direction is widened. When the line width of the horizontal line is widened, the below against the feed direction is widened.
4. In case of frame line, the line will be widened for inside.
5. Please specify 8 digits bit pattern for the ruled line. (1 digit = 4 bits, 1 bit = 1 dot)
6. When the ruled pattern is less than 8 digits, data are generated repeatedly from the specified data until it becomes 8 digits data.
   Example) When ruled line pattern "FOC" is specified, ruled line pattern "FOCFOCFO" is generated.
7. When a pattern is specified, the image is generated in 4 bytes of the drawing area. When the print base reference point is not in 4 bytes, the image is misaligned for 1 dot because the data are generated from in the middle of the pattern.

[Valid Range]

[S84-ex]

Head density	Valid range (dots)	
	Horizontal line length	Vertical line length
8 dots/mm (203 dpi)	1 to 832	1 to 20000
12 dots/mm (305 dpi)	1 to 1248	1 to 18000
24 dots/mm (609 dpi)	1 to 2496	1 to 9600

[S86-ex]

Head density	Valid range (dots)	
	Horizontal line length	Vertical line length
8 dots/mm (203 dpi)	1 to 1340	1 to 9992
12 dots/mm (305 dpi)	1 to 2010	1 to 14988

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7.8 Modification

Print of Circles	ESC+FC

Hexadecimal code	ESC	FC	Parameter
	$<1B>_{16}$	$<46>_{16}<43>_{16}$	,aaa,bbb(,c,d)
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the print of circles.

[Format]

<FC>,aaa,bbb(,c,d)

●Parameter

a[Radius] = Valid range: 5 to 999 dots

b[Line width] = Valid range: 1 to 999 dots

c[Sectional number] = Valid range: 0 to 8 If digits are omitted, the default is 0 (zero).
See the details listed below.

d[Pattern] = Valid range: 0 to 3 If digits are omitted, the default is 0 (zero).
0: Solid line (black)
1: Gray 1
2: Gray 2
3: Gray 3

●Sectional number

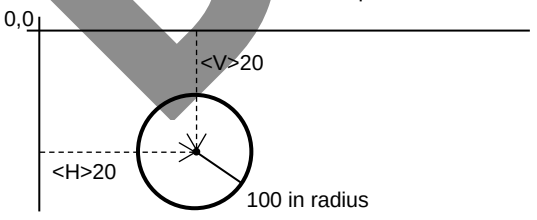


[Coding Example] Solid line circle of 100 dots in radius, 8 dots in line width

<A>
<V>200<H>200
<FC>,100,8,0,0
<Q>1
<Z>

[Notes]

1. When a section number value outside of the range is specified, it will be processed as “0”. In this case, this will not be a command error.
2. When the pattern designation value outside of the range is specified, it will be processed as “0”. In this case, this will not be a command error.
3. When the print start position is outside of the printable area, printing will not be performed due to command error.
4. This command sets the base reference point to the center of a circle.



5. This command can be registered to the format.
6. In case of frame line, the line will be widened for inside.

[Valid range]

Model	Valid range (dots)	
	Radius	Line width
S84-ex series	5 to 999	1 to 999
S86-ex series	5 to 999	1 to 999

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7.9 Modification

Print of Triangles

ESC+FT

Hexadecimal code	ESC	FT	Parameter
	$<1B>_{16}$	$<46>_{16}<54>_{16}$	,aaaa,bbbb(,cccc,d)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the print of triangles.

[Format]

<FT>,aaaa,bbbb(,cccc,d)

●Parameter

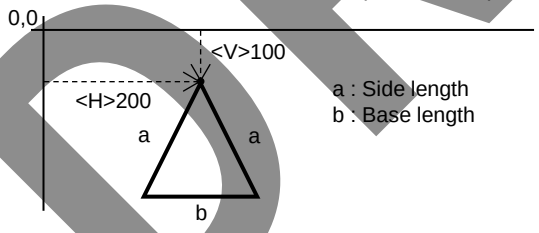
a[Side length] = Valid range: 10 to 2000 dots
b[Line width] = Valid range: 1 to 1000 dots
c[Base length] = Valid range: 10 to 2000 dots
The base length can be omitted and its value will be equal to the side length.
d[Pattern] = Valid range: 0 to 3 If digits are omitted, the default is 0 (zero).
0: Solid line (black)
1: Gray 1
2: Gray 2
3: Gray 3

[Coding Example] ide length: 100 dots, Line width: 8 dots, Base length: 100 dots

<A>
<V>100<H>200
<FT>,100,8,100,0
<Q>1
<Z>

[Notes]

1. When the pattern value outside of the range is specified, it will be processed as “0”. In this case, this will not be a command error.
2. When the print start position is outside of the printable area, printing will not be performed due to command error.
3. When the side length is not equal to the base length, printing will not be performed due to command error.
4. This command sets the base reference point to the apex of a triangle.



5. This command can be registered to the format.
6. When the line is widened, the line will be widened for inside.
7. When the length of the base is an odd number, it will be even number automatically by adding 1 to the base length.

[Valid range]

Model	Valid range (dots)		
	Side length	Line width	Base length
S84-ex series	10 to 2000	1 to 1000	10 to 2000
S86-ex series	10 to 2000	1 to 1000	10 to 2000

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7.10 Modification

Black and White Reverse Print

ESC+(

Hexadecimal code	ESC	(	Parameter
	$<1B>_{16}$	$<28>_{16}$	aaaa,bbbbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Reversing and printing an image area from black to white and vice versa.

[Format]

<(>aaaa,bbbbb

●Parameter

A[Horizontal length in dots of the reverse image area] = Refer to the table below

B[Vertical height in dots of the reverse image area] = Refer to the table below

[Coding Example] Horizontal length in dots of reverse image area: 200, Vertical height in dots of reverse image area: 70

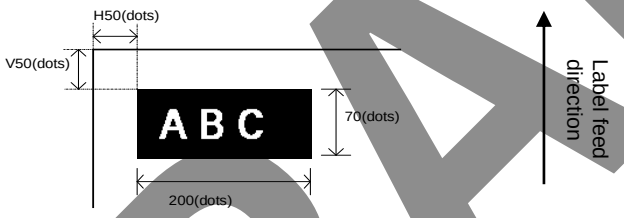
<A>

<V>50<H>50<P>2<L>0202<XM>ABC

<V>50<H>50**<(>200,70**

<Q>2

<Z>



[Notes]

1. Specify this command after the print data which to be reversed. When this command is specified before the print data which to be reversed, the image is printed in black and not reversed.
2. To set print start position, specify Horizontal Print Position <H> and Vertical Print Position <V> prior to this command.
3. When the print start position is outside of the printable area, printing will not be performed due to command error.

[Remark]

Keep the black print area under 30% of overall label.

[Valid range]

[S84-ex]

Head density	Valid range (dots)	
	Reverse area in horizontal direction	Reverse area in vertical direction
8 dots/mm (203 dpi)	8 to 832	8 to 20000
12 dots/mm (305 dpi)	8 to 1248	8 to 18000
24 dots/mm (609 dpi)	8 to 2496	8 to 9600

[S86-ex]

Head density	Valid range (dots)	
	Reverse area in horizontal direction	Reverse area in vertical direction
8 dots/mm (203 dpi)	8 to 832	8 to 20000
12 dots/mm (305 dpi)	8 to 1248	8 to 18000

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7.11 Modification

Character Code	ESC+KC

Hexadecimal code	ESC	KC	Parameter
	$<1B>_{16}$	$<4B>_{16}<43>_{16}$	a
Initial value	a=0		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]

Specify the character code.
Normally, the character code is specified in the user mode of the printer, however, the character code can be changed temporary with this character code command <KC>.

[Format]

<KC>a

●Parameter

a[Character code] = 2 : UTF-16
3 : UTF-8

[Coding Example 1] In case of UTF-8

<A>
<KC>2
<CC>1
<V>100<H>200<P>2<RD>S00,40,40,$<E5\ B6\ B7>_{16}$
<Q>2
<Z>

[Coding Example 2] In case of UTF-16

<A>
<KC>3
<CC>1
<V>100<H>200<P>2<RD>S00,40,40,$<5D\ B7>_{16}$
<Q>2
<Z>

[Notes]

1. This command is not necessary to specify at the normal label printing.
2. This command can be used more than once in the same item.

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7.12 Modification

Registration of Form Overlay

ESC+&

Hexadecimal code	ESC	&	Parameter
	$<1B>_{16}$	$<26>_{16}$	(aab～b)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command is in effect until a new specification is made.
	Valid range between item	The set command is in effect until a new specification is made.

[Function]

Storing a label image in the volatile form overlay memory.

[Format]

<&>(aab～b)

●Parameter

a[Registration key] = Valid range : 01～99 (omissible)
b[Comment] = Maximum 16 bytes (omissible)

[Coding Example]

```
<A>
<V>100<H>50<FW>1010V800H750
<V>100<H>50<FW>0505V760H710
<V>150<H>100<XB>0MODEL
<&>01DATA1
<Z>
```

[Notes]

1. This command saves fixed print contents to a CF card in the printer and then, Form Overlay Call </> combines the contents with drawing of general data to print out.
2. Specify this command at the end of data string that is to be stored. Drawing valid range in form overlay registration is same as printable area.
3. Only 1 format can be registered with the form overlay registration <&>. Any code in the valid range (01-99) can be specified for the registration key.
4. To change the stored data, specify Form Overlay Clear <*&>, and then register new data.
5. Invoke stored data by Form Overlay Call</>.
6. When specifying Label Size <A1>, it will be extracted in the specified area.

[Valid Commands]

Print position	<V>	<H>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>
	<WB>	<WL>	<RG>							
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP
	<BF>	<BS>	<BL>	<BL><d>	<BM>	<BM>				
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>	<2D33>
	<2D50>	<BX>	<2D51>							
Composite symbol	<EU>									
Modification	<WD>	<FW>	<(>	<RF>	<RM>					
Graphic	<G>	<GM>	<GP>							

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7.13 Modification

Form Overlay Call	ESC+/

Hexadecimal code	ESC	/	Parameter
	<1B>$_{16}$	<2F>$_{16}$	(aa)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command is in effect until a new specification is made.
	Valid range between item	The set command is in effect until a new specification is made.

[Function]

Recalling the label image from the form overlay memory for printing.

[Format]

</>(aa)

●Parameter

a[Registration key] = Valid range : 01～99 (omissible)

[Coding Example]

```
<A>
</>01
<V>200<H>100<P>0<$>B,100,100,6
<$=>SATOPRINTER
<V>720<H>150<B>102100*95000012345*
<Q>2
<Z>
```

[Notes]

1. This command invokes the data registered by Registration of Form Overlay <&> to print.
2. When detecting this command in general print data, it will be combined with drawing stored in form overlay and printed.
3. Regarding the registration key specification, an error will not occur even the registration key is different because the registration key is not checked.

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7.14 Modification

Partial Editing	ESC+0

Hexadecimal code	ESC	0	Parameter
	$<1B>_{16}$	$<30>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between item	The set command becomes invalid.

[Function]

Replacing a specified area of the previous label with new data.

[Format]

<0>

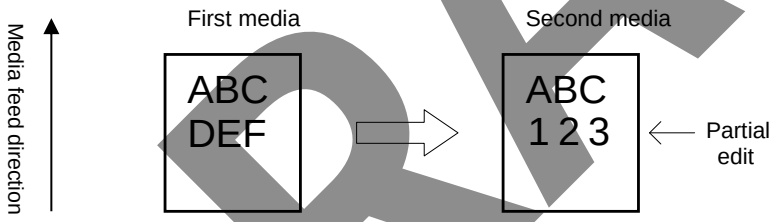
[Coding Example] [DFE], a part of print data, is changed to [123].

<A>
<V>100<H>200<P>2<L>0202<XM>ABC
<V>200<H>200<P>2<L>0202<XM>DEF
<Q>1
<Z>

First media

<A>
<0>
<V>200<H>200<P>2<L>0202<XM>123
<Q>1
<Z>

Second media



[Notes]

1. Use this command to edit only one part of previous print data.
2. Specify the exact same parameters for the image to be replaced as were specified in the original data stream; including rotation, expansion, pitch, etc. This will ensure the new data will exactly replace the old image.
3. A specified portion of the previous data will be cleared.
4. If Rotation <%> is included in the specified editing portion, keep it for partial editing.
5. Use this command with fixed pitch, same font or same digit number. Proportional pitch text cannot be used with this command.

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7.15 Modification

Partial Copying	ESC+WD

Hexadecimal code	ESC	WD	Parameter
	$<1B>_{16}$	$<57>_{16}<44>_{16}$	VaaaaaHbbbbYcccccXdddd
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Copying an image from one location to another on the same label.

[Format]

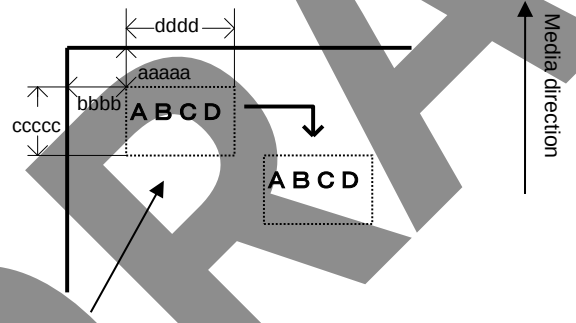
<WD>VaaaaaHbbbbYcccccXdddd

●Parameter

a[Vertical position of the top left corner of the area] = See the table below
b[Horizontal position of the top left corner of the area] = See the table below
c[Vertical length of the image area to be copied] = See the table below
d[Horizontal length of the image area to be copied] = See the table below

[Coding Example] Vertical position of the top left corner of the area: 50 Horizontal position of the top left corner of the area: 50
Vertical length of the image area to be copied: 200 Horizontal length of the image area to be copied: 400

<A>
<V>50<H>50<P>2<L>0202<XU>ABCD
<V>300<H>100**<WD>V50H50Y200X400**
<Q>2
<Z>



Dotted line part indicates the area to be copied.
"ABCD" will be printed .

[Notes]

1. To locate the destination of the copy, specify Vertical Print Position <V> and Horizontal Print Position <H> prior to this command.
2. The position of the new target area must not be inside the original image.
3. If the reference area of the target image exceeds the print area, printing will not be performed due to command error.

[Valid Range]

[S84-ex]

Head density	Valid range (dots)	
	The horizontal position of the top left corner of the area Horizontal length of the image area to be copied	The vertical position of the top left corner of the area Vertical length of the image area to be copied
8 dots/mm (203 dpi)	1 to 832	1 to 20000
12 dots/mm (305 dpi)	1 to 1248	1 to 18000
24 dots/mm (609 dpi)	1 to 2496	1 to 9600

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[S-86ex]

Head density	Valid range (dots)	
	The horizontal position of the top left corner of the area Horizontal length of the image area to be copied	The vertical position of the top left corner of the area Vertical length of the image area to be copied
8 dots/mm (203 dpi)	1 to 1340	1 to 9992
12 dots/mm (305 dpi)	1 to 2010	1 to 14988

* The command error occurs when the image exceeded the printable area due to the difference between the print start position, base reference point and dot number even the parameter is in the valid range.

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7.16 Modification

Print of Journal	ESC+J

Hexadecimal code	ESC	J	Parameter
	$<1B>_{16}$	$<4A>_{16}$	a～a+CR$<0D>_{16}$
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the print of the journal.

[Format]

<J>a～a+CR

●Parameter

a[Journal print column] = Print data

CR[Control code (0DH)]

[Coding Example]

<A>
<J>
ABCD+CR
EFGH+CR
<Z>

[Notes]

1. Starts journal print from vertical position of 2 dots and horizontal position of 2 dots.
2. Character pitch is set to 2 dots and line pitch is set to 16 dots.
3. Prints in 2 x 2 times of XS font.
4. Use of this command in combination with other commands excluding [Reprint <C>] and [Black and White Reverse Print <(>) is invalid.
5. A line feed is inserted regardless the setting of the ignore CR/LF in this command.

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7.17 Modification

Call and Print of Font & Logo

ESC+RF

Hexadecimal code	ESC	RF	Parameter
	$<1B>_{16}$	$<52>_{16}<46>_{16}$	aabbbb,n～n
Initial value	aa=01, bbbb=1		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Invoking and printing the font and logo downloaded with the exclusive tool.

[Format]

<RF>aabbbb,n～n

●Parameter

a [Font ID number] = Valid range: 01 to 99
b [Print digit] = Valid range: 1 to 9999
n [Print data] = Data

[Coding Example 1] When [AB] is printed in one-byte characters with this command [Font ID No.: 01 Print digit: 4]
(Unicode A: $<0041>_{16}$ B: $<0042>_{16}$)

<A>
<PS>
<V>100<H>100<L>0101
<RF>010004,<4100>16<0042>$_{16}$
<Z>

[Coding Example 2] When calling and printing logo [Font ID No.: 02 Print digit: 2]

<A>
<V>100<H>100<L>0101**<RF>020002, <826B>$_{16}$**
<Z>

[Notes]

1. Please specify the value that the high byte and low byte of Unicode are switched for the print data.
2. Specify [Print digit: 0002] and [Print data: $<826B>_{16}$] when recall and print logos.

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7.18 Modification

Mirror Image	ESC+RM

Hexadecimal code	ESC	RM	Parameter
	$<1B>_{16}$	$<52>_{16}<4D>_{16}$	aaaa,bbbbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Allowing mirror image printing of data.

[Format]

<RM>aaaa,bbbbb

●Parameter

A[Horizontal length of the mirror image area] = Refer to the table below.
B[Vertical length of the mirror image area] = Refer to the table below.

[Coding Example 1] When specifying the mirror image area:

<A>
<H>100<V>200<XM>12345
<H>100<V>200**<RM>0200,0080**
<Q>1
<Z>

[Coding Example 2] When not specifying the mirror image area:

<A>
<H>100<V>200<XS>12345
<RM>
<Q>1
<Z>

[Notes]

1. When the parameter “aaaa” and “bbbbb” are not specified, all print data specified prior to this command will be mirrored.
2. Any data outside the print area will not be mirrored.
3. If specifying this command for the item that does not contain print data, the command error will occur.
4. This command cannot be used together with other commands that reedit the print data. Refer to the invalid command for the list below. When invalid commands are specified, printing may not be correct.
5. This command cannot be used together with some of the control commands. Refer to the invalid command for the list below. When invalid commands are specified, printing may not be correct.
6. This command cannot be used together with some of the modification commands. Refer to the invalid command for the list below.
   When invalid commands are specified, printing may not be correct.
7. The print image before the mirror printing command will be mirror printed. The print data after this command is not mirror printed.
   Also, note that when specifying the mirror printing command more than once, the image will be rotated for the specified number of times and printed.
8. When a barcode is mirror printed, the reading of the mirrored barcode and head check area are not guaranteed.
9. When mirror printing is implemented, all mirrored image is targeted for the head check.

[Valid range for the mirror rotation start position]

[S84-ex]

Head density	Valid Range (dots)	
	Horizontal position of reference point for mirror image	Vertical position of reference point for mirror image
8 dots/mm (203 dpi)	1 to 832	1 to 20000
12 dots/mm (305 dpi)	1 to 1248	1 to 18000
24 dots/mm (609 dpi)	1 to 2496	1 to 9600

[S86-ex]

Head density	Valid Range (dots)	
	Horizontal position of reference point for mirror image	Vertical position of reference point for mirror image
8 dots/mm (203 dpi)	1 to 1340	1 to 9992
12 dots/mm (305 dpi)	1 to 2010	1 to 14988

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[Valid range for the mirror rotation]

[S84-ex]

Head density	Valid Range (dots)	
	Horizontal length of mirror image area	Vertical length of mirror image area
8 dots/mm (203 dpi)	8 to 832	8 to 20000
12 dots/mm (305 dpi)	8 to 1248	8 to 18000
24 dots/mm (609 dpi)	8 to 2496	8 to 9600

[S86-ex]

Head density	Valid Range (dots)	
	Horizontal length of mirror image area	Vertical length of mirror image area
8 dots/mm (203 dpi)	8 to 1340	8 to 9992
12 dots/mm (305 dpi)	8 to 2010	8 to 14988

[Commands cannot be used together with this command]

Commands that reedit the print image	<WD>	<F>	<(>	<O>	<WA>	<WU>
Registration	<GI>	<GT>	<PI>			
Modification	<%>	<R>				

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7.19 Modification

Work Shift Information	ESC+WN

Hexadecimal code	ESC	WN	Parameter
	$<1B>_{16}$	$<57>_{16}<4E>_{16}$	a,hh,mm,ll,nnn...n
Initial value	1.24.00.1.<space>		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Set the work shift start time and name of the specified work shift code.

[Format]

<WN>a,hh,mm,ll,nnn…n

●Parameter

a	=	1, 2 or 3	: shift code
hh	=	00 – 24	: shift start time (hours)
mm	=	00 – 59	: shift start time (minutes) (when hh=24, 00)
ll	=	1-16	: shift name length
nnn…n	=	<space>, A-Z , 0-9	: shift name maximum 16 characters

[Coding Example]

<A>

<WN>1,08,00,7,MORNING

<Z>

[Notes]

1. The command error occurs when the work shift information is disabled in the closed setting mode of the printer.
2. When the parameter is not specified, the default value will be used.
3. When the length of the sift name(nnn...n) exceeds the value of the length parameter (ll), the exceeded part is cut off.
4. When the length of the sift name(nnn...n) is less than the value of the length parameter (ll), the blank is filled with space.
5. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command to use.
6. This command cannot be used together with <WS> command. When <WN> command and <WS> command is used in the same label, the work shift information may not be printed correctly.

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7.20 Modification

Print of Work Shift Information

ESC+WS

Hexadecimal code	ESC	<WS>	Parameter
	$<1B>_{16}$	$<57>_{16}<53>_{16}$	a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the print of work shift information (Shift code, Start time of printer use, Shift name).

[Format]

<WS>a

●Parameter

a[Data to be printed] = 1: Shift code
2: Start time of printer use
3: Shift name

[Coding Example]

```
<A>
<XS>
<V>050<H>050<L>0101<XM>SHIFT CODE:
<V>050<H>300<L>0202<WS>1
<V>100<H>050<L>0101<XM>START TIME:
<V>100<H>300<L>0202<WS>2,
<XB>0
<V>150<H>050<L>0101<XM>SHIFT NAME:
<V>150<H>300<L>0101<WS>3
<Q>1
<Z>
```

(To get work shift information, use the command [SOH+WS])

[Notes]

1. When work shift information is disabled in the Hidden Mode of printer LCD, the command error will occur.
2. To designate the character type of print work shift information, specify the font specification command with no print data before Work Shift Information <WS>. When not designating the font specification command, the U - character is used for printing.
3. The font types can be specified are as follows: XU, XS, XM, XB, XL.
4. The font specification command to designate the character type for <WS> is set to the initial value at the next job <A>. The font specification command that designated print data does not affect the data of <WS>.
5. The details of command to obtain work shift information are as follows.
   (1) Command
   SOH+WS (01H 57H 53H)
   (2) Return status

No.	Item	Bytes	Description	Remarks
-	STX (02H)	1	Status start	
a	Shift code	1	"1" / "2" / "3"	
b	Shift start time	4	"0000" to "2359"	
c	Shift name	1 to 16		
-	EXT (03H)	1	Status end	
	Total	8 to 23		

   1) Status is returned only when the work shift information is enabled.
   2) When receiving this command while setting work shift information, status is returned after finishing its setup.
6. When the calendar setting command <WT> is used together with <WS> command, the work shift information to be printed on the label is decided according to the new time setting.
7. Only 1 calendar setting command <WT> is valid in the <A><Z> sequence. When a multiple calendar setting command <WT> is used in one <A><Z> sequence, the last <WT> is used.

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7.21 Modification

European Code Page	ESC+CE

Hexadecimal code	ESC	CE	Parameter
	<1B>16	<43>16<45>16	a～a(,b)
Initial value	a～a=858、b=Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set command is in effect until a new specification is made.
	Valid range between item	The set command is in effect until a new specification is made.

[Function]
Specify the European code page to be used.

[Format]
<CE>a～a(,b)

●Parameter
a[Code page name] = Valid range : refer to the [Code page parameter] in the next page
b[Code page setting maintain] = Valid range: P(fixed)
When "P" is specified, the selected code page is maintained. (Omissible)
When this is omitted, the selected code page is not maintained.

[Coding Example1]
<A>
<V>100<H>200<P>2<L>0304**<CE>1253**<XU>ABCDE
<Q>2
<Z>

[Coding Example2]
<A>
<V>100<H>200<P>2<L>0304**<CE>855**<XU>ABCDE
<Q>2
<Z>

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[Code page specify parameter]

Command parameter	Proper name	Description
858	DOS 858	Multilingual Latin 1 + Euro character Default Code page proprietary to SATO.
88591	8859/1	ISO 8859-1 Latin 1
88592	ISO 8859/2	ISO 8859-2 Latin 2
88599	ISO 8859/9	ISO 8859-9 Latin 5
850	DOS 850	Latin 1 Multilingual
852	DOS 852	Latin 2
855	DOS 855	Cyrillic
857	DOS 857	Turkish
737	DOS 737	Greek
864	DOS 864	Arabic*
866	DOS 866	Cyrillic II
874	DOS 874	DOS Thai*
1250	Win 1250	Central Europe
1251	Win 1251	Cyrillic
1252	Win 1252	Western Latin 1
1253	Win 1253	Greek
1254	Win 1254	Turkish
1255	Win 1255	Hebrew*
1256	Win 1256	Arabic*
1257	Win 1257	Baltic
869	IBM 869	IBM 869 Greek
862	DOS 862	DOS Hebrew*
UTF-8	UTF-8	Unicode encoding in UTF-8

* This is reserved language for function enhancement and these code pages are not supported. Refer to the supported symbol list for the details of the supported symbols. '□' is printed when unsupported symbols are specified.

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[Supported symbol list]

U+0020-U+002F !\"#\$\%&'()*+,-./ U+0030-U+003F 0123456789:;<=>? U+0040-U+004F @ABCDEFGHIJKLMNO U+0050-U+005F PQRSTUVWXYZ[\]^_ U+0060-U+006F `abcdefghijklmno U+0070-U+007F pqrstuvwxyz{|}~□ U+00A0-U+00AF ¡¢£¤¥¦§¨©ª«¬®¯ U+00B0-U+00BF °±²³´µ¶·¸¹º»¼½¾¿ U+00C0-U+00CF ÀÁÂÃÄÅÆÇÈÉÊËÌÍÎÏ U+00D0-U+00DF ÐÑÒÓÔÕÖ×ØÙÚÛÜÝÞß U+00E0-U+00EF àáâãäåæçèéêëìíîï U+00F0-U+00FF ðñòóôõö÷øùúûüýþÿ U+0100-U+0107 ĀāĂăĄąĆć U+010C-U+010F ČčĎď U+0110-U+0113 ĐđĒē U+0116-U+011B ĖėĘęĚě U+011E-U+011F Ğğ U+0122-U+0123 Ģģ	U+012A-U+012B Īī U+012E-U+012F Įį U+0130-U+0131 İı U+0136-U+0137 Ķķ U+0139-U+013E ĹĺĻļĽľ U+0141-U+0148 ŁłŃńŅņŇň U+014C-U+014D Ōō U+0150-U+015B ŐőŒœŔŕŖŗŘřŚś U+015E-U+015F Şş U+0160-U+0165 ŠšŢţŤť U+016A-U+016B Ūū U+016E-U+016F Ůů U+0170-U+0173 ŰűŲų U+0178-U+017E ŸŹźŻżŽž U+0192-U+0192 ƒ U+02C6-U+02C7 ˆˇ U+02C9-U+02C9 ¯ U+02D8-U+02D9 ˘˙
U+02DB-U+02DD ˛˜˝ U+0384-U+0386 ΄΅Ά U+0388-U+038A ΈΉΊ U+038C-U+038C Ό U+038E-U+038F ΎΏ U+0390-U+039F ΐΑΒΓΔΕΖΗΘΙΚΛΜΝΞΟ U+03A0-U+03A1 ΠΡ U+03A3-U+03AF ΣΤΥΦΧΨΩΪΫάέήί U+03B0-U+03BF ΰαβγδεζηθικλμνξο U+03C0-U+03CE πρςστυφχψωϊϋόύώ U+0401-U+040C ЁЂЃЄЅІЇЈЉЊЋЌ U+040E-U+040F ЎЏ U+0410-U+041F АБВГДЕЖЗИЙКЛМНОП U+0420-U+042F РСТУФХЦЧШЩЪЫЬЭЮЯ U+0430-U+043F абвгдежзийклмноп U+0440-U+044F рстуфхцчшщъыьэюя U+0451-U+045C ёђѓєѕіїјљњћќ U+045E-U+045F ўџ	U+0490-U+0491 ҐґЁё U+2013-U+2015 ––― U+2017-U+201A ‗‘’‚ U+201C-U+201E “”„ U+2020-U+2022 †‡• U+2026-U+2026 … U+2030-U+2030 ‰ U+2039-U+203A ‹› U+207F-U+207F ⁿ U+20AC-U+20AC € U+2116-U+2116 № U+2122-U+2122 ™ U+2219-U+221A ∙√ U+2248-U+2248 ≈ U+2264-U+2265 ≤≥

1. WGL4 (Windows Glyph List 4) is supported in this bitmap font.
   WGL4 is the name of symbol set that is defined by Microsoft.

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7.22 Modification

Kanji Font Type	ESC+KS

Hexadecimal code	ESC	KS	Parameter
	$<1B>_{16}$	$<4B>_{16}<53>_{16}$	ab
Initial value	a=31H, b=31H		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]
Specify the Kanji font type used for the Kanji print command.

[Format]
<KS>ab

●Parameter
a[Kanji font type] = "3"(33H) :GB18030 (Default)
"5"(35H) :KSX1001
"6"(36H) :BIG5

b[Font] = "1"(31H) : Mincho (Default)
"2"(32H) : Gothic

[Coding Example] Set Mincho with GB18030
<A>
<KS>31
<Z>

[Notes]
1.When the font specified by this command is not supported, available font for every Kanji font is printed.
2.Unused value for the parameter "a" is reserved for Japanese.
3.Use this command solely together with <A> and <Z>.

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8 Font command

8.1 Font

XUFont (Default Font Size: 5×9 dots)	ESC+XU

Hexadecimal code	ESC	XU	Parameter
	$<1B>_{16}$	$<58>_{16}<55>_{16}$	n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the characters in default font size of W5 x H9 dots.

[Format]

<XU>n～n

●Parameter

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<u><XU>ABCDE</u>**
<Q>2
<Z>

[Notes]

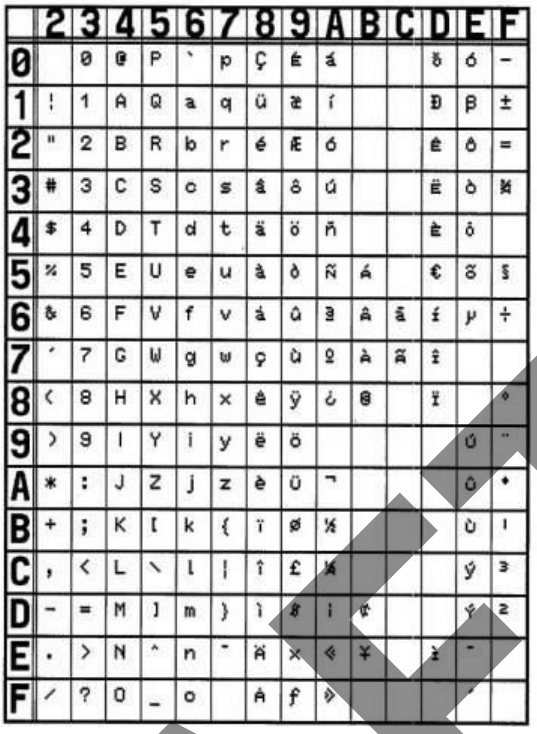
1. XU font can be set to either fixed pitch or proportional pitch.
2. To set up fixed and proportional pitch, use the command or go to the Advanced Mode of printer LCD display.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<O>	<WD>
	<%A>	<WS>								
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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XU Font Character Set



The above is printed with width 5 dots x height 9 dots, enlarged 3 times for both vertically and horizontally.

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8.2 Font

XS Font (Default Font Size: 17×17 dots)

ESC+XS

Hexadecimal code	ESC	XS	Parameter
	$<1B>_{16}$	$<58>_{16}<53>_{16}$	n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the characters in default font size of W17 x H17 dots.

[Format]

<XS>n～n

●Parameter

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<XS>ABCDE**
<Q>2
<Z>

[Notes]

1. XS font can be set to either fixed pitch or proportional pitch.
2. To set up fixed and proportional pitch, use the command or go to the Advanced Mode of printer LCD display.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<O>	<WD>
	<%A>	<WS>								
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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XS Font Character Set



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	'	p	Ç	É	á	0		ð	Ô	-
1	!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	Ò	=
3	#	3	C	S	c	s	â	ô	ú			Ë	Õ	¾
4	$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Ö	§
6	&	6	F	V	f	v	å	û	ª	Â	ã	í	µ	÷
7	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	Þ	¸
8	(	8	H	X	h	x	ê	ÿ	¿	©		Ï	þ	°
9	)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬				Û	·
B	+	;	K	[	k	{	ï	ø	½				Ù	¹
C	,	<	L	\	l	¦	î	£	¼				ý	³
D	−	=	M	]	m	}	ì	Ø	¡	ø		¦	Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	¯	
F	/	?	O	_	o		Å	ƒ	»				´	

The above is printed with width 17 dots x height 17 dots, enlarged 2 times for both vertically and horizontally.

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8.3 Font

XM Font (Default Font Size: 24×24 dots)

ESC+XM

Hexadecimal code	ESC	XM	Parameter
	$<1B>_{16}$	$<58>_{16}<4D>_{16}$	n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the character in default font size of W24 x H24 dots.

[Format]

<XM>n～n

●Parameter

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<XM>ABCDE**
<Q>2
<Z>

[Notes]

1. XM font can be set to either fixed pitch or proportional pitch.
2. To set up fixed and proportional pitch, use the command or go to the Advanced Mode of printer LCD display.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<O>	<WD>
	<%A>	<WS>								
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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XM Font Character Set



The above is printed with width 24 dots x height 24 dots, enlarged 2 times for both vertically and horizontally.

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8.4 Font

XB Font (Default Font Size: 48×48 dots)

ESC+XB

Hexadecimal code	ESC	XB	Parameter
	$<1B>_{16}$	$<58>_{16}<42>_{16}$	an～n
Initial value	a=0		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the character in default font size of W48 x H48 dots.

[Format]

<XB>an～n

●Parameter

a[Smoothing] = 0: Smoothing disabled
1: Smoothing enabled (When Enlargement <L> rate is between threefold and ninefold)

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<XB>0ABCDE**
<Q>2
<Z>

[Notes]

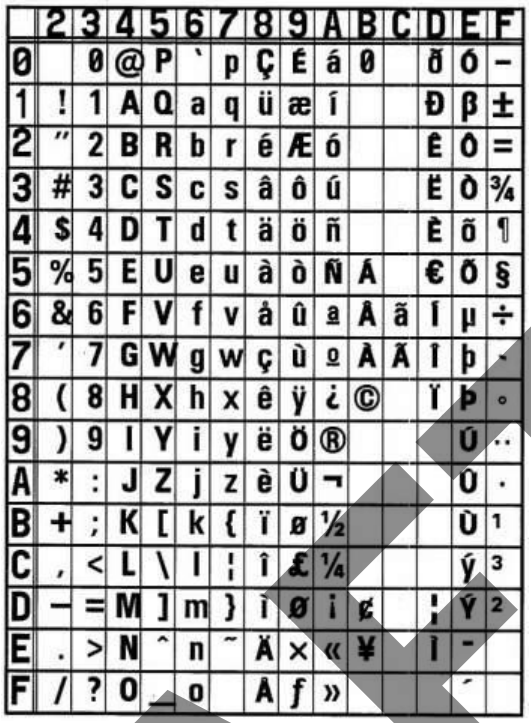
1. XB font can be set to either fixed pitch or proportional pitch.
2. To set up fixed and proportional pitch, use the command or go to the Advanced Mode of printer LCD display.
3. Even the smoothing is enabled, it will be invalid when enlargement <L> is specified for 1 time, 2 times, and 10 to 36 times.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<O>	<WD>
	<%A>	<WS>								
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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XB Font Character Set



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	0		ð	Ó	–
1	!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3	#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	§
6	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8	(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9	)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬				Û	·
B	+	;	K	[	k	{	ï	ø	½				Ù	1
C	,	<	L	\	l	¦	î	£	¼				ý	3
D	–	=	M	]	m	}	ì	Ø	¡	¢		¦	Ý	2
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	¯	
F	/	?	O	_	o		Å	ƒ	»				´	

The above is printed with width 48 dots x height 48 dots, enlarged 1 time for both vertically and horizontally.

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8.5 Font

XL Font (Default Font Size: 48×48 dots)

ESC+XL

Hexadecimal code	ESC	XL	Parameter
	$<1B>_{16}$	$<58>_{16}<4C>_{16}$	an～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the character in default font size of W48 x H48 dots.

[Format]

<XL>an～n

●Parameter

a[Smoothing] = 0: Smoothing disabled
1: Smoothing enabled (When Enlargement <L> rate is between threefold and ninefold)

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<XL>0ABCDE**
<Q>2
<Z>

[Notes]

1. XL font can be set to either fixed pitch or proportional pitch.
2. To set up fixed and proportional pitch, use the command or go to the Advanced Mode of printer LCD display.
3. Even the smoothing is enabled, it will be invalid when enlargement <L> is specified for 1 time, 2 times, and 10 to 36 times.

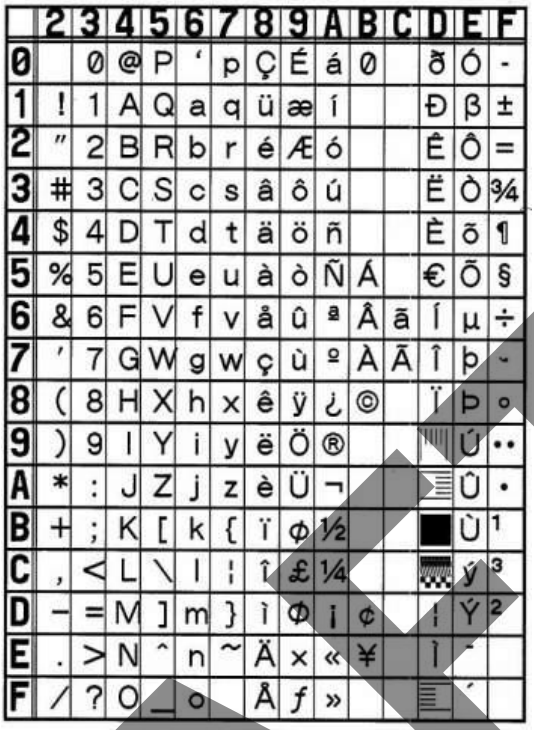
[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<PS>	<PR>	<F>	<&>	</>	<O>	<WD>
	<%A>	<WS>								
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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XL Font Character Set

Characters in default font size of W48 x H48 dots.



The above is printed with width 48 dots x height 48 dots, enlarged 1 time for both vertically and horizontally.

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8.6 Font

OCR-A Font

ESC+OA

Hexadecimal code	ESC	OA	Parameter
	$<1B>_{16}$	$<4F>_{16}<41>_{16}$	n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying OCR-A font.

[Format]
<OA>n～n

●Parameter
n[Print data] = Data

[Coding Example]
<A>
<V>100<H>100<P>2<L>0202**<OA>ABC**
<Q>2
<Z>

[Note]
Refer to the list below for the font size according to the head density.

[Font Size]

Head density	Font size (dots)
8 dots/mm (203 dpi)	W15 × H22
12 dots/mm (305 dpi)	W22 × H33
24 dots/mm (609 dpi)	W44 × H66

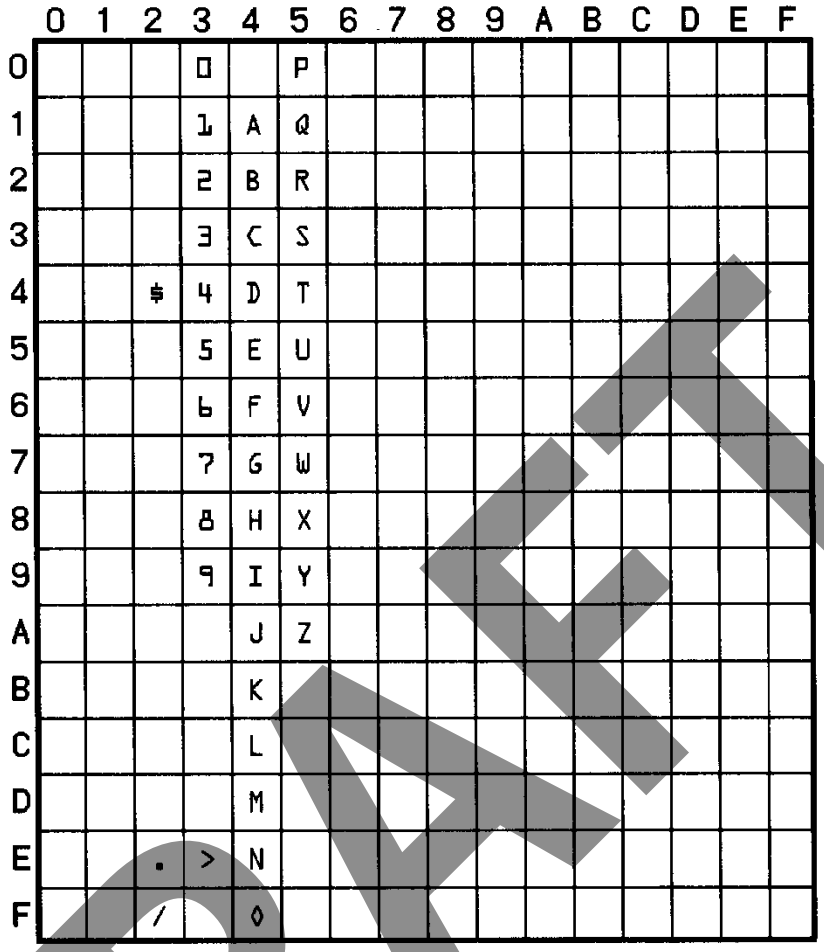
[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<%A>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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OCR-A Font Character Set

OCR-A font specification.



The above is printed in head density of 12 dots/mm, with width 22 dots x height 33 dots, enlarged 1 time for both vertically and horizontally.

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8.7 Font

OCR-B Font	ESC+OB

Hexadecimal code	ESC	OB	Parameter
	$<1B>_{16}$	$<4F>_{16}<42>_{16}$	n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying OCR-B font.

[Format]
<OB>n～n

●Parameter
n[Print data] = Data

[Coding Example]
<A>
<V>100<H>100<P>2<L>0202**<OB>ABC**
<Q>2
<Z>

[Note]
Refer to the list below for the font size according to the head density.

[Font Size]

Head density	Font size (dots)
8 dots/mm (203 dpi)	W20 × H24
12 dots/mm (305 dpi)	W30 × H36
24 dots/mm (609 dpi)	W60 × H72

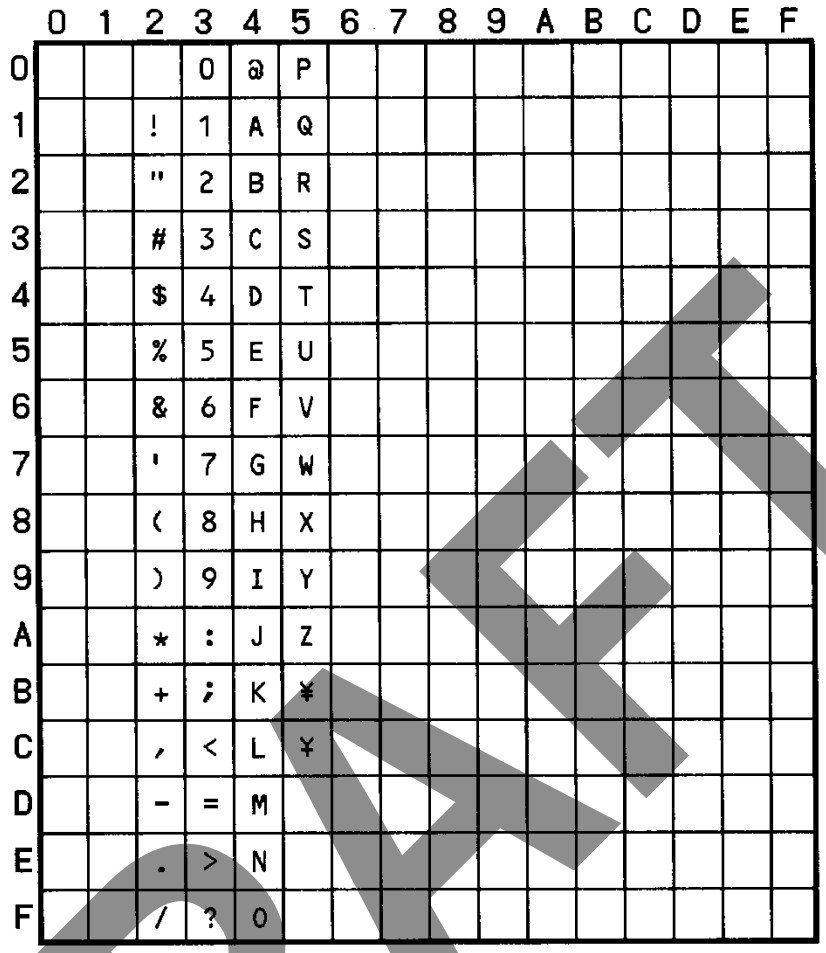
[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<%A>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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OCR-B Font Character Set

OCR-B font specification.



The above is printed in head density of 12 dots/mm, with width 30 dots x height 36 dots, enlarged 1 time for both vertically and horizontally.

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8.8 Font

Shape of Outline Font

ESC+$

Hexadecimal code	ESC	$	Parameter
	$<1B>_{16}$	$<24>_{16}$	a,bbb,ccc,d
Initial value	a=A、bbb=50、ccc=50、d=0		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter becomes the initial value at the next item <A>.

[Function]

Specifying the type, size, and shape of the font.

[Format]

<$>a,bbb,ccc,d

●Parameter

a[Font type] = A: Helvetica bold (Proportional)
B: Helvetica bold (Fixed character pitch)

b[Font width] = 24 to 999 dots

c[Font height] = 24 to 999 dots

d[Font shape] = 0: Standard font (Black)
1: Outline font
2: Gray font (Pattern 1)
3: Gray font (Pattern 2)
4: Gray font (Pattern 3)
5: Shaded font
6: Outline and shaded font
7: Mirror image font
8: Standard italic font
9: Outline, shaded, and italic font

[Coding Example] Font type : A Font width : 100 dots
Font height : 100 dots Font shape : 1

```
<A>
<V>100<H>100<P>2
<$>A,100,100,1<$=>SATO
<Q>2
<Z>
```

[Notes]

1. The shape of Italic font is inclined 15-degree within font width specification
2. Specify this command prior to Print of Outline Font <$=>.
3. If specified dots in 1 ~ 9 of [Font shape] are tiny, they may be unrecognizable as a font.
4. Font width and height specification up to 24 dots are printable; however, some fonts may be unreadable because of character crowding.

[Valid Commands]

Font	<$=>									

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8.9 Font

Print of Outline Font

ESC+$=

Hexadecimal code	ESC	$=	Parameter
	$<1B>_{16}$	$<24>_{16}<3D>_{16}$	n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying the print outline font.

[Format]
<$=>n～n

●Parameter
n[Print data] = Data

[Coding Example] Print data: SATO
<A>
<V>100<H>100<P>2
<$>A,100,100,1**<u><$=>SATO</u>**
<Q>2
<Z>

[Notes]
1. Specify Shape of Outline Font <$> prior to this command.
2. Font height specification includes ascender and descender areas. For proportional pitch, letter size width of outline font varies depending on the individual font.
3. Use Character Pitch <P> to specify font pitch.
4. The shape of Italic font is inclined 15-degree within font width specification. Font height specification includes ascender and descender areas.
5. If specified dots in 1 ~ 9 of [Font shape] are tiny, they may be unrecognizable as a font.
6. In the Shape of Outline Font <$>, font width and height specification up to 24 dots are printable; however, some fonts may be unreadable because of character crowding.

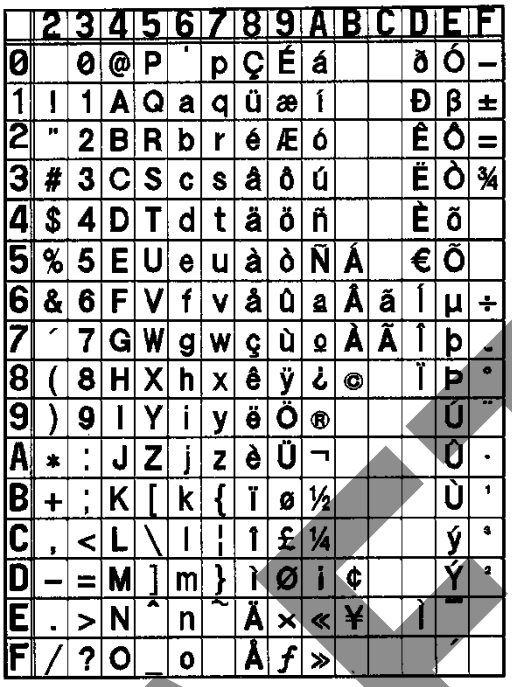
[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<%>	<F>							
Font	<$>									
Calendar	<WA>	<WU>								

DRAFT

Outline Font Character Set

Outline font specification.



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	'	p	Ç	É	á			ð	Ó	–
1	!	1	A	Q	a	q	ü	æ	í			Ð	β	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3	#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	ñ			È	õ	
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	
6	&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7	´	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	.
8	(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9	)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬				Û	·
B	+	;	K	[	k	{	ï	ø	½				Ù	¹
C	,	<	L	\	l	¦	î	£	¼				ý	³
D	–	=	M	]	m	}	ì	Ø	¡	¢			Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	¯	
F	/	?	O	_	o		Å	ƒ	»				´	

The above is printed in head density of 12 dots/mm, with width 48 dots x height 48 dots, enlarged 1 time for both vertically and horizontally.

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8.10 Font

CG Font

ESC+RD

Hexadecimal code	ESC	RD	Parameter
	$<1B>_{16}$	$<52>_{16}<44>_{16}$	abb,ccc,ddd,n～n abc,ddd,eee,n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying CG font type, font style, font size, and print data.

[Format]

<RD>abc,ddd,eee,n～n

●Parameter

a[Font type] = A [CG Times]
B [CG Triumvirate]
C [SATOGAMMA] (Code page can be switched by ESC+CE command)
D [SATOVICA] (Code page can be switched by ESC+CE command)
E-Z,a-z TTF downloaded with the dedicate tool

b[Character set] = 0 No specification for the character set (Fixed)
* When selecting SATOGAMMA and SATOVICA, refer to the code page parameter in the next page.

c [Font style] = 0 [Standard]
1 [Bold]
2 [Italic]
3 [Bold+Italic]

d[Horizontal length] = 004 to 999 (dot specification)
P02 to P99 (point specification)

e[Vertical length] = 004 to 999 (dot specification)
P02 to P99 (point specification)

n[Print data] = Data

[Coding Example] Font type: CG Times

```
<A>
<V>100<H>100<P>2
<RD>A00,P10,P10,SATO
<Q>2
<Z>
```

[Notes]

1. Set font size in [dot specification] or [point specification].
2. Dot size varies depending on the head density. Refer to the table below.

Head density	1 dot size (mm)
8dots/mm (203dpi)	0.125
12 dots/mm (305dpi)	0.083
12 dots/mm (609dpi)	0.042

3. One point is 0.35mm.

[Font size range]

Head density	Valid range (dots)	
	Horizontal line length	Vertical line length
8dots/mm (203dpi)	4 to 832	4 to 999
12 dots/mm (305dpi)	5 to 999	5 to 999
12 dots/mm (609dpi)	9 to 999	9 to 999

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<%>	<F>	<PS>	<PR>	<%A>				

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[Code page specify parameter]

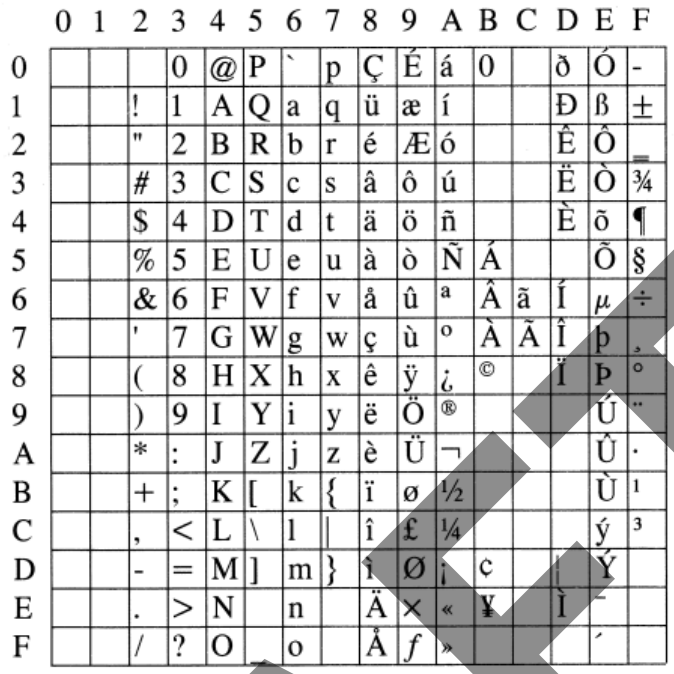
Command parameter	Name
-	Use the code page specified by the CE command.
0	DOS 858 Multilingual Latin 1 + Euro character Default Code page proprietary to SATO.
1	ISO 8859-1 Latin 1
2	ISO 8859-2 Latin 2
3	ISO 8859-9 Latin 5
4	CP737 DOS Greek
5	CP855 DOS Cyrillic
6	CP864 DOS Arabic *
7	CP874 Windows Thai *
8	PC-850 Multilingual
9	CP852 DOS Central European
A	CP857 DOS Turkish
B	CP866 DOS Cyrillic II
C	CP1250 Windows Central European
D	CP1251 Windows Cyrillic
E	CP1252 Windows Western Latin 1
F	CP1253 Windows Greek
G	CP1254 Windows Turkish
H	CP1255 Windows Hebrew *
I	CP1256 Windows Arabic *
J	CP1257 Windows Baltic
K	CP869 IBM Greek
L	CP862 DOS Hebrew *
@	Unicode UTF-8

* This is reserved language for function enhancement and these code pages are not supported.

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CG Times Font Character Set

CG Times font specification.

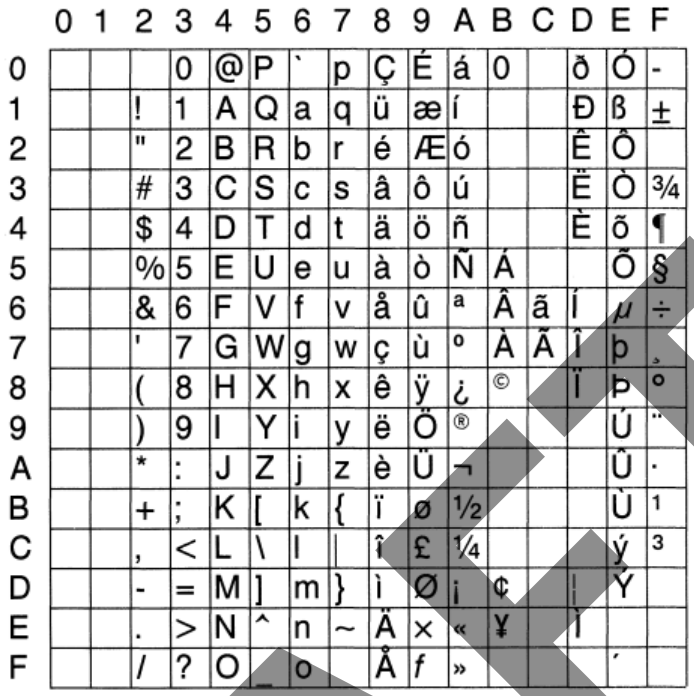


	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	0		ð	Ó	-
1			!	1	A	Q	a	q	ü	æ	í			Đ	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	‗
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á			Õ	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	·
B			+	;	K	[	k	{	ï	ø	½				Ù	¹
C			,	<	L	\	l	|	î	£	¼				ý	³
D			-	=	M	]	m	}	ì	Ø	¡	ç		¦	Ý	
E			.	>	N		n		Ä	×	«	¥		Ì	¯	
F			/	?	O	_	o		Å	*f*	»				´	

DRAFT

CG Triumvirate Font Character Set

CG Triumvirate font specification.



	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	0		ð	Ó	-
1			!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó			Ê	Ô	
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4			$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á			Õ	§
6			&	6	F	V	f	v	å	û	ª	Â	ã	Í	µ	÷
7			'	7	G	W	g	w	ç	ù	º	À	Ã	Î	þ	¸
8			(	8	H	X	h	x	ê	ÿ	¿	©		Ï	Þ	°
9			)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A			*	:	J	Z	j	z	è	Ü	¬				Û	·
B			+	;	K	[	k	{	ï	ø	½				Ù	¹
C			,	<	L	\	l	|	î	£	¼				ý	³
D			-	=	M	]	m	}	ì	Ø	¡	¢		¦	Ý	
E			.	>	N	^	n	~	Ä	×	«	¥		Ì		
F			/	?	O	_	o		Å	ƒ	»				´	

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8.11 Font

16×16 dots Horizontal Writing Kanji	ESC+K1

Hexadecimal code	ESC	K1	Parameter
	$<1B>_{16}$	$<4B>_{16}<31>_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying horizontal writing Kanji font of W16 x H16 dots.

[Format]

<K1>an～n

●Parameter

a[Kanji specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code

n[Data] = Specify according to the selected Kanji code range

* Printing may not be correct when the number of data is increased/decreased.

[Coding Example] Specified character in HEX, horizontal enlargement: 2 times, vertical enlargement: 3 times (when KSX1001 is selected)

<A>
<V>100<H>200<P>2<L>0203
<K1>HB0A1B0A2B0A3B0A4B0A5
<Q>2
<Z>

[Notes]

1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5

[Remarks]

1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

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8.12 Font

24×24 dots Horizontal Writing Kanji

ESC+K2

Hexadecimal code	ESC	K2	Parameter
	$<1B>_{16}$	$<4B>_{16}<32>_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying horizontal writing Kanji font of W24 x H24 dots.

[Format]

<K2>an～n

●Parameter

a[Kanji specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code

n[Data] = Specify according to the selected Kanji code range

* Printing may not be correct when the number of data is increased/decreased.

[Coding Example] Specifying Hex character of Shift JIS, Horizontal enlargement scale: 3 times, Vertical enlarged scale: 5 times (when KSX1001 is selected)

```
<A>
<V>100<H>200<P>2<L>0305
<K2> HB0A1B0A2B0A3B0A4B0A5
<Q>2
<Z>
```

[Notes]

1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5 times

[Remarks]

1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

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8.13 Font

16×16 dots Horizontal Writing Kanji with One-byte Characters	ESC+K8

Hexadecimal code	ESC	K8	Parameter
	$<1B>_{16}$	$<4B>_{16}<38>_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Printing W16 x H16 dots horizontal writing Kanji with W8 x H16 dots one-byte characters.

[Format]
<K8>an～n

●Parameter
a[Kanji specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code
n[Data] = Specify according to the selected Kanji code range
* Printing may not be correct when the number of data is increased/decreased.
* Code that can be specified as a half - width character is 20h-7Fh.

[Coding Example] Specified character in HEX, horizontal enlargement: 2 times,
vertical enlargement: 3 times (when KSX1001 is selected)
<A>
<V>100<H>200<P>2<L>0203
<K8>HB0A1B0A2B0A3B0A4B0A5303132
<Q>2
<Z>

[Notes]
1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times

[Remarks]
1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

DRAFT

8.14 Font

24×24 dots Horizontal Writing Kanji with One-byte Characters	ESC+K9

Hexadecimal code	ESC	K9	Parameter
	<1B>$_{16}$	<4B>$_{16}$<39>$_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Printing W24 x H24 dots horizontal writing Kanji with W12 x H2416 dots one-byte characters.

[Format]
<K9>an～n

●Parameter
a[Kanji specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code
n[Data] = Specify according to the selected Kanji code range
* Printing may not be correct when the number of data is increased/decreased.
* Code that can be specified as a half - width character is 20h-7Fh.

[Coding Example] Specified character in HEX, horizontal enlargement: 3 times,
vertical enlargement: 5 times (when KSX1001 is selected)
<A>
<V>100<H>200<P>2<L>0305
<K9>HB0A1B0A2B0A3B0A4B0A5303132
<Q>2
<Z>

[Notes]
1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5 times

[Remarks]
1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.
4. For one-byte characters, printing will be performed in W12 x H24 dots.
5. For two-byte characters, printing will be performed in W24 x H24 dots.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

DRAFT

8.15 Font

16×16 dots Vertical Writing Kanji

ESC+k1

Hexadecimal code	ESC	k1	Parameter
	$<1B>_{16}$	$<6B>_{16}<31>_{16}$	an～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying vertical text flow Kanji font of W16 x H16 dots.

[Format]

<k1>an～n

●Parameter

a[Kanji specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code

n[Data] = Specify according to the selected Kanji code range

* Printing may not be correct when the number of data is increased/decreased.

[Coding Example] Specified character in HEX, horizontal enlargement: 3 times,
vertical enlargement: 5 times (when KSX1001 is selected)

<A>
<V>100<H>200<P>2<L>0305
<k1>HB0A1B0A2B0A3B0A4B0A5
<Q>2
<Z>

[Notes]

1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes ASCII / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5 times

[Remarks]

1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

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8.16 Font

24×24 dots Vertical Writing Kanji

ESC+k2

Hexadecimal code	ESC	k2	Parameter
	$<1B>_{16}$	$<6B>_{16}<32>_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying vertical text flow Kanji font of W24 x H24 dots.

[Format]

<k2>an～n

●Parameter

a[Kanji specification mode] =
- H : Hexadecimal character
- B : Binary code
- I : Smoothing function by Hexadecimal character
- C : Smoothing function by Binary code
- J : Highlight function by Hexadecimal character
- D : Highlight function by Binary code
- K : Smoothing and highlight functions by Hexadecimal character
- E : Smoothing and highlight functions by Binary code

n[Data] = Specify according to the selected Kanji code range

* Printing may not be correct when the number of data is increased/decreased.

[Coding Example] Specified character in HEX, horizontal enlargement: 3 times, vertical enlargement: 5 times (when KSX1001 is selected)

```
<A>
<V>100<H>200<P>2<L>0305
<k2>HB0A1B0A2B0A3B0A4B0A5
<Q>2
<Z>
```

[Notes]

1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes ASCII / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5 times

[Remarks]

1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

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8.17 Font

16×16 dots Vertical Writing Kanji with One-byte Characters	ESC+k8

Hexadecimal code	ESC	k8	Parameter
	$<1B>_{16}$	$<6B>_{16}<38>_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Printing W16 x H16 dots vertical text flow Kanji font with W8 x H16 dots one-byte characters.

[Format]

<k8>an～n

●Parameter

a[Kanji specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code

n[Data] = Specify according to the selected Kanji code range
* Printing may not be correct when the number of data is increased/decreased.
* Code that can be specified as a half - width character is 20h-7Fh.

[Coding Example] Specified character in HEX, horizontal enlargement: 2 times,
vertical enlargement: 3 times (when KSX1001 is selected)

<A>
<V>100<H>200<P>2<L>0203
<k8>HB0A1B0A2B0A3B0A4B0A5303132
<Q>2
<Z>

[Notes]

1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes ASCII / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5 times

[Remarks]

1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.
4. For one-byte characters, printing will be performed in W8 x H16 dots.
5. For two-byte characters, printing will be performed in W16 x H16 dots.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

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8.18 Font

24×24 dots Vertical Writing Kanji with One-byte Characters	ESC+k9

Hexadecimal code	ESC	k9	Parameter
	$<1B>_{16}$	$<6B>_{16}<39>_{16}$	an～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Printing W24 x H24 dots vertical text flow Kanji with W12 x H24 dots one-byte characters.

[Format]
<k9>an～n

●Parameter
a[Kanji specification mode] = H: Hexadecimal character
B: Binary code
I : Smoothing function by Hexadecimal character
C: Smoothing function by Binary code
J: Highlight function by Hexadecimal character
D: Highlight function by Binary code
K: Smoothing and highlight functions by Hexadecimal character
E: Smoothing and highlight functions by Binary code
n[Data] = Specify according to the selected Kanji code range
* Printing may not be correct when the number of data is increased/decreased.
* Code that can be specified as a half - width character is 20h-7Fh.

[Coding Example] Specified character in HEX, horizontal enlargement: 2 times,
vertical enlargement: 3 times (when KSX1001 is selected)
<A>
<V>100<H>200<P>2<L>0305
<k9>HB0A1B0A2B0A3B0A4B0A5303132
<Q>2
<Z>

[Notes]
1. Hexadecimal character = 4 bytes ASCII / 1 character
2. Binary code = 2 bytes ASCII / 1 character
3. Smoothing function enlargement scale = Horizontal/Vertical valid range: 3 to 12 times
4. Highlight function enlargement scale = Horizontal/Vertical valid range: 1 to 5 times

[Remarks]
1. In highlight function, the character width will increase based on the enlargement specification.
2. In highlight function, smearing problem may occur depending on the characters.
3. Printable fonts vary according to the font type. Make sure to check if it is printable or not before using.
4. For one-byte characters, printing will be performed in W12 x H24 dots.
5. For two-byte characters, printing will be performed in W24 x H24 dots.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<&>	</>	<O>	<WD>			

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8.19 Font

Registration of 16×16 dots External Character

ESC+T1

Hexadecimal code	ESC	T1	Parameter
	$<1B>_{16}$	$<54>_{16}<31>_{16}$	Abbn～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Registering W16 x H16 dots external character.

[Format]

<T1>abbn～n

●Parameter

a[Selection of registered data type] = H : Registered data in hexadecimal character
B : Registered data in binary code

b[Registered font code address] = H: in the range from "21" to "7F", up to 95 items can be registered
B: in the range from 21H to 7FH, up to 95 items can be registered

n[External character registered data] = Data

[Coding Example] Registration and printing by binary code of BIG5

```
<A>
<CC>0
<T1>B<21>16
<00FF ・・・・・・・・・・FF00>16
<Z>

<A>
<CC>0
<V>100<H>200<K1>B<90>16<21>16
<Q>2
<Z>
```

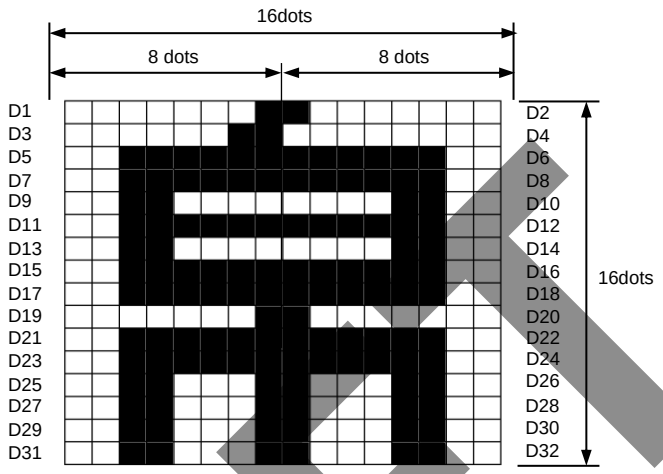
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[Notes]

1. Register external character of W16xH16 dots to the internal memory or user registration memory.
2. Re-entry to the registered area is allowed.
3. Refer to the data registration procedure below.
4. Registered contents in the memory of the printer will be deleted by turning off the printer. Re-register again for the next operation.
5. When Kanji data is replaced(GB18030 ⇔ BIG5 ⇔ KSX1001), re-register again after deleting the external character registration.

External character file: [16 ×16]

D1	D2
D3	D4
D5	D6
⋮	⋮
D31	D32



D1 and D2 respectively consist of [00000001] and [10000000]. To register the above external character, consider D1 data as $<01>_{16}$ and D2 data as $<80>_{16}$.
In the same manner, D3 as $<03>_{16}$, D4 as $<00>_{16}$, D5 as $<3F>_{16}$, and D6 as $<FC>_{16}$, so that the specification of external character registered data will be $<018003003FFC\cdots\cdots>_{16}$ and up to D32.

[Remarks]

1. When it is registered in the user registration memory, the data is maintained even the printer power is off.
2. It is not possible to use the internal memory specification and user registration memory specification at the same time.
3. Please specify the slot of the registered memory.
   However, it will be registered in the internal memory when <CC> command is not yet sent after the printer power on.

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8.20 Font

Registration of 24×24 dots External Character

ESC+T2

Hexadecimal code	ESC	T2	Parameter
	$<1B>_{16}$	$<54>_{16}<32>_{16}$	Abbn～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Registering W24 x H24 dots external character.

[Format]
<T2>abbn～n

●Parameter
a[Selection of registered data type] = H : Registration data in hexadecimal character
B : Registration data in binary code
b[Registered font code address] = H : Within the range from 21 to 7F, up to 95 addresses can be registered.
B : Within the range from 21H to 7FH, up 95 addresses can be registered.
n[External character registration data] = Data

[Coding Example] Registration and printing by binary code of GB18030

<A>
<CC>0
<T2>B<00>$_{16}$
<00FF ・・・・・・・・・・FF00>$_{16}$
<Z>

<A>
<CC>0
<V>100<H>200<K2>B<80>$_{16}$<21>$_{16}$
<Q>2
<Z>

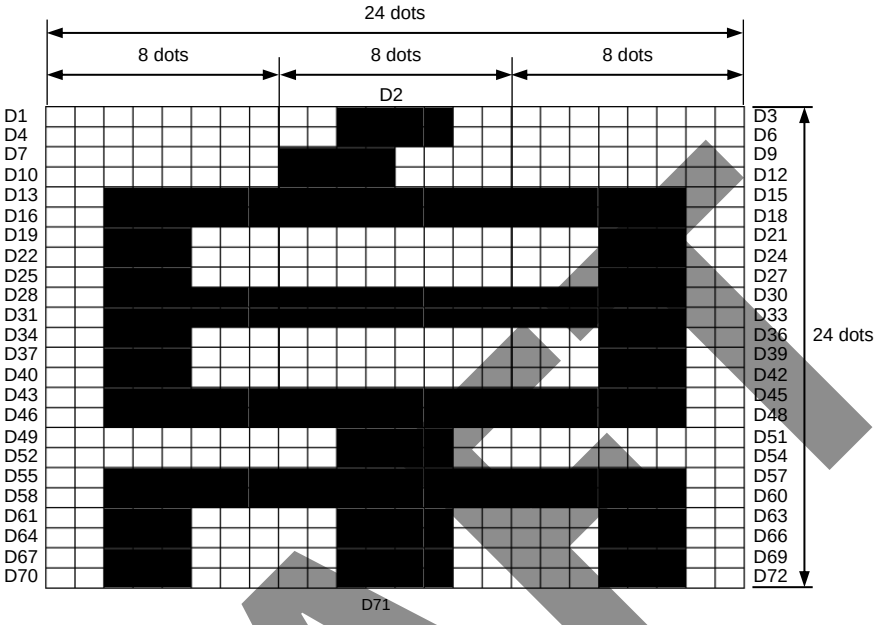
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[Notes]

1. Register external character of W24xH24 dots to the internal memory or user registration memory.
2. Re-entry to the registered area is allowed.
3. Refer to the data registration procedure below.
4. Registered contents in the memory of the printer will be deleted by turning off the printer. Re-register again for the next operation.
5. When Kanji data is replaced(GB18030 ⇔BIG5 ⇔KSX1001), re-register again after deleting the external character registration.

External character file: [24 x 24]

D1	D2	D3
D4	D5	D6
D7	D8	D9
⋮	⋮	⋮
D70	D71	D72



D1, D2 and D3 respectively consist of [00000000], [00111100] and [00000000]; therefore, to register the above external character, consider D1 data as $<00>_{16}$, D2 data as $<3C>_{16}$ and D3 data as $<00>_{16}$.
In the same manner, D4 as $<00>_{16}$, D5 as $<3C>_{16}$, D6 as $<00>_{16}$, so that the specification of external character registered data will be $<003C003C00\cdots\cdots>_{16}$ and up to D72.

[Remarks]

1. When it is registered in the user registration memory, the data is maintained even the printer power is off.
2. It is not possible to use the internal memory specification and user registration memory specification at the same time.
3. Please specify the slot of the registered memory.
   However, it will be registered in the internal memory when <CC> command is not yet sent after the printer power on.

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8.21 Font

Call of Horizontal Writing External Character

ESC+K1(K2)

Hexadecimal code	ESC	K1(K2)	Parameter
	$<1B>_{16}$	$<4B>_{16}<31>_{16}(<4B>_{16}<32>_{16})$	ab～b
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Recall the horizontal writing external characters registered to the printer memory and print in horizontal writing.

[Format]

<K1>ab～b
<K2>ab～b

●Parameter

a[External character specification mode] = H : Hexadecimal character
B : Binary code
I : Smoothing function by Hexadecimal character
C : Smoothing function by Binary code
J : Highlight function by Hexadecimal character
D : Highlight function by Binary code
K : Smoothing and highlight functions by Hexadecimal character
E : Smoothing and highlight functions by Binary code

b[Registration code] = H, I, J, K : “8021”～“807F”
B, C, D, E : 8021H～807FH

[Coding Example] Recall 16x16 external characters, registration data by HEX characters of GB18030

```
<A>
<T1>H21
00FF ・・・・・・・・・・FF00
<Z>

<A>
<V>100<H>200<K1>H8021
<Q>2
<Z>
```

[Notes]

1. If print error occurs, register again.
2. Please specify the slot of the memory to be recalled.
   However, data in the internal memory will be recalled when <CC> command is not yet sent after the printer power on.

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8.22 Font

Call of Vertical Writing External Character

ESC+k1(k2)

Hexadecimal code	ESC	k1(k2)	Parameter
	$<1B>_{16}$	$<6B>_{16}<31>_{16}(<6B>_{16}<32>_{16})$	ab～b
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Invoking vertical writing external character registered in the printer memory to print.

[Format]

<k1>ab～b

<k2>ab～b

●Parameter

a [External character specification mode] =
- H : Hexadecimal character
- B : Binary code
- I : Smoothing function by Hexadecimal character
- C : Smoothing function by Binary code
- J : Highlight function by Hexadecimal character
- D : Highlight function by Binary code
- K : Smoothing and highlight functions by Hexadecimal character
- E : Smoothing and highlight functions by Binary code

b [Registration code] =
- H, I, J, K : “8021”～“807F”
- B, C, D, E : 8021H～807FH

[Coding Example] Recall 16x16 external characters, registration data by HEX characters of GB18030

```
<A>
<T1>H21
00FF ・・・・・・・・・・FF00
<Z>

<A>
<V>100<H>200<k1>H8021
<Q>2
<Z>
```

[Notes]

1. If print error occurs, register again.
2. Please specify the slot of the memory to be recalled.
   However, data in the internal memory will be recalled when <CC> command is not yet sent after the printer power on.

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8.23 Font

U Font
(Default Font Size: 5×9dots)

ESC+U

Hexadecimal code	ESC	U	Parameter
	$<1B>_{16}$	$<55>_{16}$	n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the characters in default font size of W5 x H9 dots.

[Format]

<U>n～n

●Parameter

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<U>ABCDE**
<Q>2
<Z>

[Note]

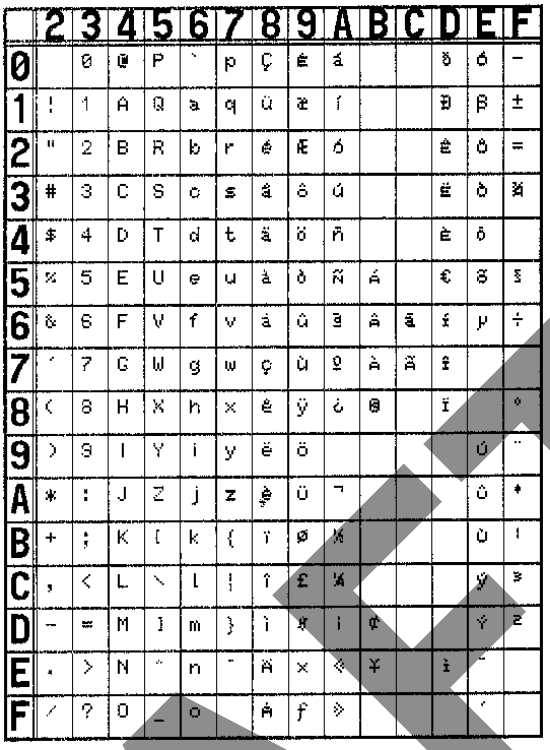
Only the fixed pitch is available for U font.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<WS>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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U Font Character Set



Above is the print sample in head density of 12dots/mm and enlarged 3 times for both vertically and horizontally.

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8.24 Font

S Font
(Default Font Size: 8×15dots)

ESC+S

Hexadecimal code	ESC	S	Parameter
	$<1B>_{16}$	$<53>_{16}$	n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the characters in default font size of W8 x H15 dots.

[Format]

<S>n～n

●Parameter

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<S>ABCDE**
<Q>2
<Z>

[Note]

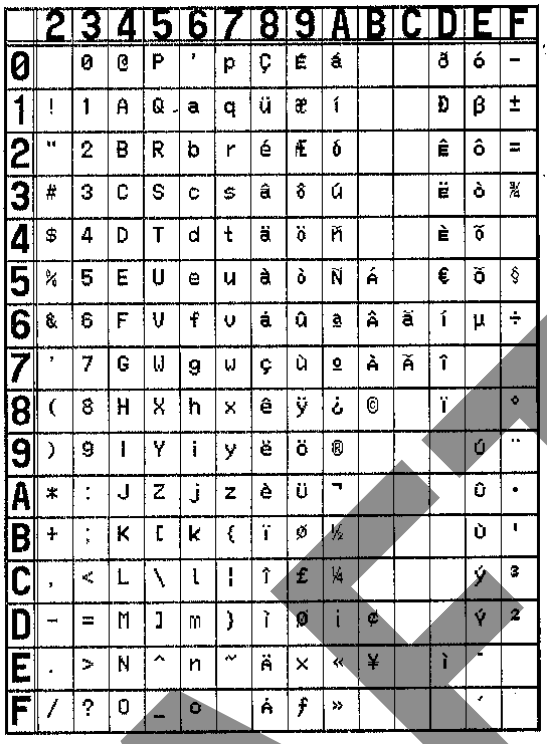
Only the fixed pitch is available for S font.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<WS>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

DRAFT

S Font Character Set



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	'	p	Ç	É	á			ð	ó	-
1	!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	ô	=
3	#	3	C	S	c	s	â	ô	Ú			ë	ò	¾
4	$	4	D	T	d	t	ä	ö	Ñ			è	õ	
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	§
6	&	6	F	V	f	v	á	û	ª	Â	ã	í	µ	÷
7	'	7	G	W	g	w	ç	Ù	º	À	Ã	Î		
8	(	8	H	X	h	x	ê	ÿ	¿	©		Ï		°
9	)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬				Û	•
B	+	;	K	[	k	{	ï	ø	½				Ù	¹
C	,	<	L	\	l	¦	î	£	¼				ý	³
D	-	=	M	]	m	}	ì	Ø	¡	ø			Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		ì	¯	
F	/	?	O	_	o		Å	ƒ	»				´	

Above is the print sample in head density of 12dots/mm and enlarged 2 times for both vertically and horizontally.

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8.25 Font

M Font (Default Font Size: 13×20 dots)	ESC+M

Hexadecimal code	ESC	M	Parameter
	$<1B>_{16}$	$<4D>_{16}$	n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the character in default font size of W13 x H20 dots.

[Format]

<M>n～n

●Parameter

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<M>ABCDE**
<Q>2
<Z>

[Note]

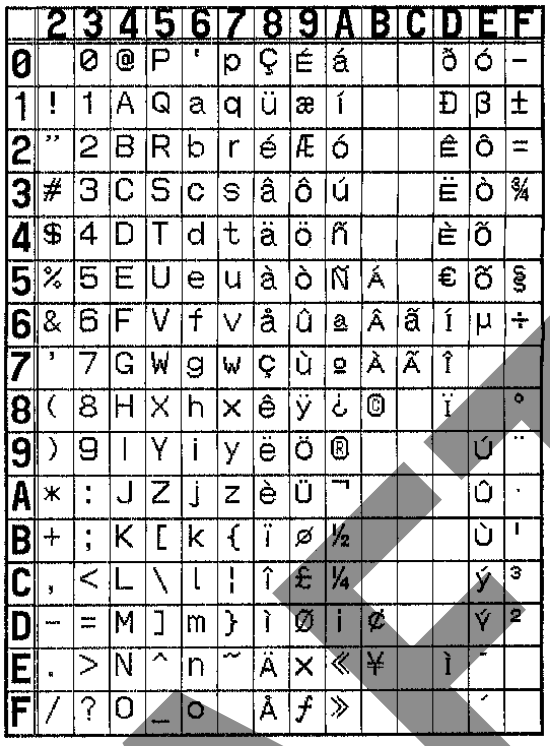
Only the fixed pitch is available for M font.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<WS>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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M Font Character Set



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	'	p	Ç	É	á			ð	ó	-
1	!	1	A	Q	a	q	ü	æ	í			Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3	#	3	C	S	c	s	â	ô	ú			Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	ñ			è	õ	
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	§
6	&	6	F	V	f	v	å	û	ª	Â	ã	í	µ	÷
7	'	7	G	W	g	w	ç	ù	º	À	Ã	Î		
8	(	8	H	X	h	x	ê	ÿ	¿	©		ï		°
9	)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬				Û	·
B	+	;	K	[	k	{	ï	ø	½				Ù	¹
C	,	<	L	\	l	¦	î	£	¼				ý	³
D	-	=	M	]	m	}	ì	Ø	¡	ø			Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		ì	¯	
F	/	?	O	_	o		Å	ƒ	»				´	

Above is the print sample in head density of 12dots/mm and enlarged 2 times for both vertically and horizontally.

DRAFT

8.26 Font

WB Font (Default Font Size: 18×30 dots)	ESC+WB

Hexadecimal code	ESC	WB	Parameter
	$<1B>_{16}$	$<57>_{16}<42>_{16}$	an～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the character in default font size of W18x H30 dots.

[Format]

<WB>an～n

●Parameter

a[Smoothing] = 0 : Smoothing disabled
1 : Smoothing enabled
(When Enlargement <L> rate is between 3 and 12)

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<WB>0ABCDE**
<Q>2
<Z>

[Notes]

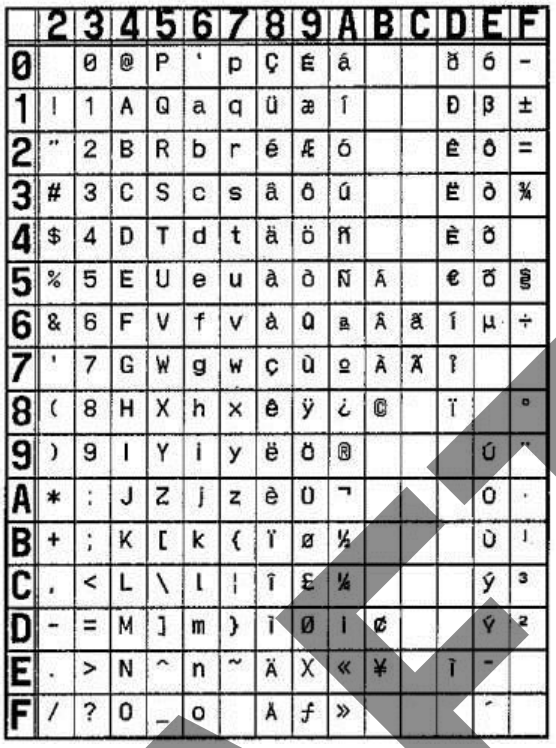
1. Only the fixed pitch is available for WB font.
2. Even the smoothing is enabled, it will be invalid when enlargement <L> is specified for 1 time, 2 times, and 13 to 36 times.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<WS>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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WB Font Character Set



	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	'	p	Ç	É	á			ð	ó	-
1	!	1	A	Q	a	q	ü	æ	Í			Ð	ß	±
2	"	2	B	R	b	r	é	Æ	ó			Ê	Ô	=
3	#	3	C	S	c	s	â	ô	Ú			Ë	Ò	¾
4	$	4	D	T	d	t	ä	ö	Ñ			È	õ	
5	%	5	E	U	e	u	à	ò	Ñ	Á		€	Õ	§
6	&	6	F	V	f	v	à	Û	ª	Â	ã	Í	µ	÷
7	'	7	G	W	g	w	ç	ù	º	À	Ã	Î		
8	(	8	H	X	h	x	ê	ÿ	¿	©		Ï		°
9	)	9	I	Y	i	y	ë	Ö	®				Ú	¨
A	*	:	J	Z	j	z	è	Ü	¬				Û	·
B	+	;	K	[	k	{	Ï	ø	½				Ù	¹
C	,	<	L	\	l	¦	î	£	¼				ý	³
D	-	=	M	]	m	}	ì	Ø	¡	Ø			Ý	²
E	.	>	N	^	n	~	Ä	×	«	¥		Ì	¯	
F	/	?	O	_	o		Å	ƒ	»				´	

Above is the print sample in head density of 12dots/mm and enlarged 1 time for both vertically and horizontally.

DRAFT

8.27 Font

WL Font (Default Font Size: 28×52 dots)	ESC+WL

Hexadecimal code	ESC	WB	Parameter
	$<1B>_{16}$	$<57>_{16}<4C>_{16}$	an～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the character in default font size of W28 x H52 dots.

[Format]

<WL>an～n

●Parameter

a[Smoothing] = 0 : Smoothing disabled
1 : Smoothing enabled
(When Enlargement <L> rate is between 3 and 12)

n[Print data] = Data

[Coding Example]

<A>
<V>100<H>200<P>2<L>0304**<WL>0ABCDE**
<Q>2
<Z>

[Notes]

1. Only the fixed pitch is available for WL font.
2. Even the smoothing is enabled, it will be invalid when enlargement <L> is specified for 1 time, 2 times, and 13 to 36 times.

[Valid Commands]

Print position	<V>	<H>								
Modification	<P>	<L>	<%>	<F>	<&>	</>	<O>	<WD>	<WS>	
Barcode	<D><d>	<BL><d>								
Calendar	<WA>	<WU>								

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WL Font Character Set

Characters in default font size of W28 x H52 dots.



Above is the print sample in head density of 12dots/mm and enlarged 1 time for both vertically and horizontally.

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8.28 Font

Multiple Language Font

ESC+RG

Hexadecimal code	ESC	RG	Parameter
	$<1B>_{16}$	$<52>_{16}<47>_{16}$	abc,ddd,eee,n～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify font type (Arabic or Thai), character set, font style, font size and print data.

[Format]

<RG>a,b,c,ddd,eee,n～n

●Parameter

a[Input character code]	=	0	:	UNICODE(UTF-8)
		1	:	UNICODE(UTF-16)
b[Character set]	=	2	:	AR Hebe Sans Thai
		13	:	AR Roman Arabic
c[Font style]	=	0	:	[Standard]
		1	:	[Bold]
		2	:	[Italic]
		3	:	[Bold+Italic]
d[Horizontal size]	=	Valid range	:	020 to 999 (dots)
		Valid range	:	P09 to P99 (point specification)
e[Vertical size]	=	Valid range	:	020 to 999 (dots)
		Valid range	:	P09 to P99 (point specification)
n[Print data]	=	Data		

[Coding Example] Italic printing of Thai by UTF-8 specification, horizontal size: P10, vertical size: P10

* $<\sim>_{16}$ means the byte specification (in the example below, E0B895=3 bytes)

<A>
<V>100<H>100<P>2
<RG>0,2,2,P10,P10,<E0B895E0B989E0B8A1E0B8A2E0B8B3E0B881E0B8B8E0B989E0B887>$_{16}$
<Q>2
<Z>

[Notes]

1. Set the font size by "dot specification" or "point specification."
2. Dot size differs according to the head density (refer to the list below)

Head density	1 dot size (mm)
8dots/mm (203dpi)	0.125
12 dots/mm (305dpi)	0.083
12 dots/mm (609dpi)	0.042

3. 1 point is 0.35mm.
4. When the specified character does not exist in the character set, the character is not printed. When the specified character is a space or square mark in the character set, the image is printed.
5. Character size may be smaller than parameter, because it takes into account the multi-language
6. UTF-8 supports up to four byte character code. 5 bytes UTF-8 and 6 bytes UTF-8 are not supported.
7. Complex script languages (Arabic, Thai) are printed with proportional fonts, regardless of setting of font type in order to use the formatter function and the combined font function.
8. The linefeed code cannot be inserted among one word or one character code forming one character for the complex script languages (Arabic, Thai). If the linefeed is inserted, the rendering result is not guaranteed.
9. Comply with Unicode 2.1 (note that if the first byte is 0x1b when UTF-16BE is specified, it is judged as a ESC code).
10. When executing sequential number printing in Arabic and Thai, the character codes are rendered as a character string and it may not function properly.
11. When the character string exceeds the horizontal printable range, the string might not be printed.
12. When the character for uniting is selected alone, part or all of the character might not be printed.

[Valid Commands]

Print position	<V>	<H>								
Modification	<%>	<&>	</>	<WD>						

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9 Barcode Specification

In barcode specification, print of various barcode, change of bar width ratio, and print of guard bar or human-readable information can be performed by designating (B, D, BD) after ESC.
This and the next page should be read closely and followed.
Refer to the table below for the specification of B, D, and BD.

[Specification of Bar Width Ratio]

Barcode specification parameter	Barcode	<B>	<D>	<BD>
0	CODABAR (NW-7)	1:3	1:2	2:5
1	CODE39	1:3	1:2	2:5
2	ITF	1:3	1:2	2:5
5	Industrial 2 of 5	1:3	1:2	2:5
6	Matrix 2 of 5	1:3	1:2	2:5

(1) Bar width ratio

The barcode is composed of Narrow Bar, Wide Bar, Narrow Space and Wide Space. The Bar width ratio is the proportion of Narrow Bar and Wide Bar.

Bar width ratio (Ratio 1 : 3) <B>
This barcode is composed of Narrow Bar [1] and Wide Bar [3].
Bar width ratio (Ratio 1 : 2) <D>
This barcode is composed of Narrow Bar [1] and Wide Bar [2].
Bar width ratio (Ratio 2 : 5) <BD>
This barcode is composed of Narrow Bar [2] and Wide Bar [5].

If the specifying bar width ratio for your own convenience, register the ratio with Bar Width Ratio <BT> and print labels with Print of Specified Bar Width Ratio <BW>.

(2) Width of narrow bar and height of barcode

Narrow bar indicates the narrow bar width, and bar height indicates the height of the barcode.
For instance, printing narrow bar for 1 dot in head density of 8 dots/mm (203dpi), the narrow bar width will be 0.125mm and barcode scanner may have a reading problem. To avoid this problem, set the narrow bar to 2 dots so that the narrow bar width will be 0.25mm and this will improve the scanner reading condition.
There is a necessity to set the narrow bar width based on the printer head density or performance of barcode scanner.
In bar width ratio, [Narrow bar width] specification sets the width of the bar.
e.g.) When bar width ratio = 1 : 3 and narrow bar width is 3 dots, bar width ratio becomes 3 : 9.
Bar height is to specify the height of the barcode, and proper height based on the scanner type can be set.

(3) Intercharacter gap

Intercharacter gap is the space between two adjacent barcode characters in a discrete barcode.
To specify and enable intercharacter gap, insert Character Pitch <P> right before barcode specification such as <B>,<D> and <BD> or Print of Barcode with Registered Ratio <BW>. If not, initial value (2 dots) will be set.

Intercharacter gap is designable for the following barcodes.
1) NW-7
2) CODE 39
3) Industrial 2 of 5
4) Matrix 2 of 5

Intercharacter gap is the multiplier of values specified with Character Pitch <P> and narrow bar width.
e.g.) When Character Pitch <P> is 3 and narrow bar width is 2 dots:
Intercharacter gap = 3 x 2 = 6 (dots)

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(4) Designation of human readable information (HRI) and guard bar

For UPC-A and EAN8 and 13digits barcode, availability of human-readable information (hereinafter HRI) and guard bar can be specified.

Barcode specification parameter	Barcode	<B>	<D>	<BD>
3	JAN/EAN13	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available
4	JAN/EAN8	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available
H	UPC―A	HRI : Nil Guard bar : Nil	HRI : Nil Guard bar : Available	HRI : Available Guard bar : Available

Barcode specification parameter	Barcode	<BM>	<BL>
H	JAN/EAN13	HRI : Available Guard bar : Available	HRI : Nil Guard bar : Available

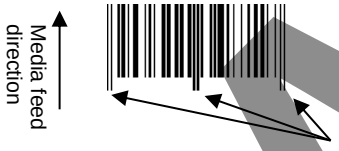
1) Specification of <B> (No HRI, No guard bar)

If specifying <B>, the following barcode will be printed.



2) Specification of <D> (No HRI, with Guard bar)

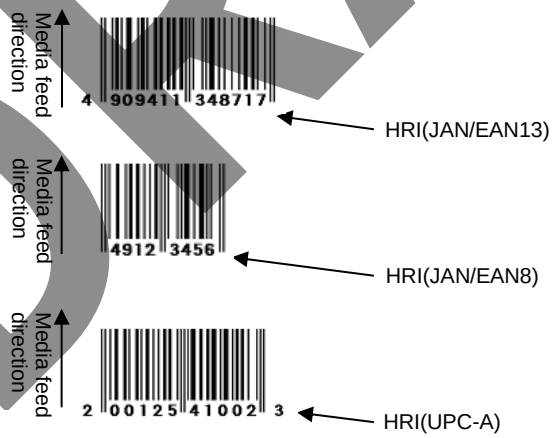
If specifying <D>, the following barcode will be printed.



[Note] HRI is printable specifying <Character Type> data subsequently to <D>.
For more information, refer to Barcode Specification (Selection of HRI) <D>~<d>.

3) Specification of <BD> (HRI and guard bar available)

If specifying <BD>, the following barcode will be printed.



[Barcode Specification Only]

Barcode specification parameter	Barcode	<B>
C	CODE93	Barcode only
E	UPC-E	Barcode only
G	CODE128	Barcode only
I	UCC/EAN 128 for standard carton ID	Barcode only

[Important]

1. In this case, barcode will not have Bar Width Ratio and HRI.
2. HRI will not be printed when barcode is error for barcode with HRI.

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(5) Composition of check digit

Refer to the table below for check digit in each barcode.

[Composition of C/D]

Barcode specification parameter	Barcode	Input digit No.	Print digit number and contents
3	JAN/EAN13	12-digit	13-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
		13-digit	13-digit (Input data of barcode) C/D is not checked.
4	JAN/EAN8	7-digit	8-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
		8-digit	8-digit (Input data of barcode) C/D is not checked.
C	CODE93	Max. 99 - digit	C/D is calculated by modulus47.
E	UPC-E	6-digit only	C/D is calculated by modulus10.
G	CODE128	-	C/D is calculated by modulus103.
H	UPC-A	11-digit only *1	12-digit (Input data of barcode + C/D) C/D is calculated by modulus10.
I	GS1-128for standard carton ID (UCC/EAN128)	17-digit only	C/D is calculated by modulus103.

[Note] C/D stands for “Check Digit”.

*1 The data input digit for UPC-A is only 11 digits, however, the specified data is printed without check digit calculation when 12 digits is specified. (Closed to the users)

(6) Print Direction of Barcode

Print direction of barcode can be rotated. Note that when specifying Serial 1 and Serial 2 for barcode rotation, it may cause blurring due to barcode enlargement ratio.

Please avoid 1 dot narrow bar printing. "1 dot is 0.125mm" when the head density is 8dots/mm(203dpi), "1 dot is 0.083mm" when the head density is 12dots/mm(305dpi), and "1 dot is 0.042mm" when the head density is 24dots/mm(609dpi). 1 dot narrow bar may lead to unreadability of the barcode.

Parallel 1 : Forward feed print
Parallel 2 : Backfeed print at 180-degree rotation

[Note] Forward feed:
Prints horizontally to label feed direction

Parallel 1 : Forward feed print at 90-degree rotation
Parallel 2 : Forward feed print at 270-degree rotation

1) Specify the enlargement ratio of the bar width of the narrow bar for more than 2 dots when printing with Parallel 1 or Parallel 2. (“L” indicates the enlargement ratio to the bar width ratio.)

	Head density		
	8 dots/mm	12 dots/mm	24 dots/mm
Bar width ratio 1 : 2	2L or more	2L or more	4L or more
Bar width ratio 1 : 3	2L or more	2L or more	4L or more
Bar width ratio 2 : 5	1L or more	1L or more	2L or more
UPC-A/EAN/JAN	2L or more	2L or more	4L or more

2) Specify the enlargement ratio of the bar width of the narrow bar for more than 3 dots when the head density is 8dots/mm or 12dots/mm and printing with Serial 1 or Serial 2.

	Head density		
	8 dots/mm	12 dots/mm	24 dots/mm
Bar width ratio 1 : 2	3L or more	3L or more	6L or more
Bar width ratio 1 : 3	3L or more	3L or more	6L or more
Bar width ratio 2 : 5	2L or more	2L or more	4L or more
UPC-A/EAN	3L or more	3L or more	6L or more

3) To print with Serial 1 or Serial 2, drop print speed.

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9.1 Barcode

Barcode (Ratio 1:3) ESC+B

Hexadecimal code	ESC	B	Parameter
	$<1B>_{16}$	$<42>_{16}$	abbcccn～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the barcode of narrow and wide bar width ratio 1:3.

[Format]

<B>abbcccn～n

●Parameter

a[Barcode symbology] = Refer to the table below.
b[Narrow bar width] = 01 to 36 dots
c[Height of barcode] = 001 to 999 dots
n[Print data] = Data

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

a	Barcode symbology	Descriptions	Ratio
0	CODABAR (NW-7)	Set print data including Start/Stop character. Start/Stop Characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t] However, the reading result of [E, N, T, a, b, c, d, e, n, t] will be [D, B, A, A, B, C, D, D, B, A.] e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch is enabled. Refer to the code list of the CODEBAR for the print data.	1:3
1	CODE39	Set print data including Start/Stop Character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch is enabled. Refer to the code list of the CODE39 for the print data.	1:3
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, “0” will be added to the head of print data. Refer to the code list of the ITF for the print data.	1:3
3	JAN/EAN13	The barcode will have no guard bar and human readable information. Refer to the code list of the JAN/EAN13 for the print data.	Fixed (11,12, 13 digits)
4	JAN/EAN8	The barcode will have no guard bar and human readable information. Refer to the code list of the JAN/EAN8 for the print data.	Fixed (7,8 digits)
5	Industrial 2of5	Barcode character pitch is enabled. Refer to the code list of the Industrial 2of5 for the print data.	1:3
6	Matrix 2of5	Barcode character pitch is enabled. Refer to the code list of the Matrix 2of5 for the print data.	1:3
A	MSI	Print data can be specified up to 13-digit. Refer to the code list of the MSI for the print data.	Fixed
C	CODE93	Refer to CODE 93 <BC>.	Fixed
E	UPC-E	Specify 6-digit number for print data. Refer to the code list of the UPC-E for the print data.	Fixed
F	UPC add-on code Bookland	Refer to the UPC add-on code/Bookland specification <BF>.	Fixed
G	CODE128	Refer to CODE128 <BG>.	Fixed
H	UPC-A	Barcode will have no guide bar and human readable information. Refer to the code list of the UPC-A for the print data.	Fixed
I	GS1-128 (UCC/EAN128)	Refer to GS1-128(UCC/EAN128)<BI>.	Fixed
P	Postnet	Refer to the Postnet specification <BP>.	Fixed
S	USPS code	Refer to the USPS code specification <BS>.	Fixed

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[Coding Example 1] Barcode symbology : CODE39 Narrow bar width : 03 Height of barcode : 120
Print data : *1234AB*

<A>
<V>100<H>100**<B>103120*1234AB***
<Q>2
<Z>



[Coding Example 2] Barcode symbology : EAN8 Narrow bar width : 02 Height of barcode : 080
Print data : 4912345

<A>
<V>100<H>100**<B>4020804912345**
<Q>2
<Z>



[Notes]

1. Barcode character pitch is available for NW-7, CODE39, Industrial 2 of 5, and Matrix 2 of 5. To specify barcode character pitch, insert Character Pitch <P> right before Barcode symbology.

When <P> is omitted, character pitch will be as same as narrow space width and multiple of the narrow bar.

Command	Ratio	Narrow space width	<P> specification	Character pitch	
				Narrow bar width is 1	Narrow bar width is 2
<B>	1:3	1	Nil	1	2
			<P>0	1	2
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. Refer to the code list of each barcode for the print data.

[Remarks]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. A barcode that exceeds the printable area will not be printed.
3. When narrow bar is enlarged, the barcode may exceed the printable area and may not be printed.
4. The scanner may not read the barcode with a valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. Specify the narrow bar width by considering the scanner readability and the head density.
   203dpi 2dots or more
   305dpi 2dots or more
   609dpi: 4dots or more
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. If the Start / Stop character is not included in print data at the time of NW-7 or CODE39 specification, the barcode will be printed; however, the scanner can not read it.
8. If sending the print data including check digit at the time of JAN/EAN13 or JAN/ EAN8 specification, set the correct calculated value.
   The barcode will be printed even when the data includes improper check digit; however, the scanner can not read it.

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9.2 Barcode

Barcode (Ratio 1:2)

ESC+D

Hexadecimal code	ESC	D	Parameter
	$<1B>_{16}$	$<44>_{16}$	abbcccn～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the barcode of narrow and wide bar width ratio 1:2.

[Format]

<D>abbcccn～n

●Parameter

a[Barcode symbology] = Refer to the table below.
b[Narrow bar width] = 01 to 36 dots
c[Height of barcode] = 001 to 999 dots
n[Print data] = Data

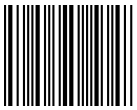
Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

A	Barcode symbology	Descriptions	Ratio
0	CODABAR (NW-7)	Set print data including Start/Stop Character. Start/Stop Characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. However, the reading result of [E, N, T, a, b, c, d, e, n, t] will be [D, B, A, A, B, C, D, D, B, A.] e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch is enabled. Refer to the code list of the CODEBAR(NW-7) for the print data.	1:2
1	CODE39	Set print data including Start/Stop Character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch is enabled. Refer to the code list of the CODE39 for the print data.	1:2
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, “0” will be added to the head of print data. Refer to the code list of the ITF for the print data.	1:2
3	JAN/EAN13	The barcode will have a guard bar and no HRI. Refer to the code list of the JAN/EAN13 for the print data.	Fixed
4	JAN/EAN8	The barcode will have a guard bar and no HRI. Refer to the code list of the JAN/EAN8 for the print data.	Fixed
5	Industrial 2of5	Barcode character pitch is enabled. Refer to the code list of the Industrial 2of5 for the print data.	1:2
6	Matrix 2of5	Barcode character pitch is enabled. Refer to the code list of the Matrix 2of5 for the print data.	1:2
H	UPC-A	The barcode will have a guard bar and no HRI. Refer to the code list of the UPC-A for the print data.	Fixed

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[Coding Example 1] Barcode symbology : CODABAR(NW-7) Narrow bar width : 03 Height of barcode : 120
Print data : A1234A

<A>
<V>100<H>100**<D>003120A1234A**
<Q>2
<Z>



[Coding Example 2] Barcode symbology : ITF Narrow bar width : 02 Height of barcode : 080
Print data : 98002345678163

<A>
<V>100<H>100**<D>20208098002345678163**
<Q>2
<Z>



[Coding Example 3] Barcode symbology : UPC-A Narrow bar width : 03 Height of barcode : 120
Print data : 20123948573

<A>
<V>240<H>100**<D>H0312020123948573**
<Q>2
<Z>



[Notes]

1. Barcode character pitch is available for NW-7, CODE39, Industrial 2 of 5, and Matrix 2 of 5. To specify barcode character pitch, insert Character Pitch <P> right before barcode symbology.
   When <P> is omitted, character pitch will be as same as narrow space width and multiple of the narrow bar.
   e.g.)

Command	Ratio	Narrow space width	<P> specification	Character pitch	
				Narrow bar width is 1	Narrow bar width is 2
<D>	1:2	1	Nil	1	2
			<P>0	1	2
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. Refer to the code list of each barcode for the print data.

[Remarks]

1. When the value other than valid range is set, command error will occur and barcode will not be printed.
2. A barcode that exceeds the printable area will not be printed.
3. When narrow bar is enlarged, the barcode may exceed the printable area and may not be printed.
4. The scanner may not read the barcode with a valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. Specify the narrow bar width by considering the scanner readability and the head density.
   203dpi: 2dots or more
   305dpi: 2dots or more
   609dpi: 4dots or more
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. If the Start / Stop character is not included in print data at the time of CODABAR(NW-7) or CODE39 specification, the printing of barcode will be performed; however, the scanner can not read it.
8. If sending the print data including check digit at the time of JAN/EAN13 or JAN/ EAN8 specification, set the correct calculated value.
   The barcode will be printed even when the data includes improper check digit; however, the scanner can not read it.

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9.3 Barcode

Barcode (Selection of HRI)

ESC+D ~ ESC+d

Hexadecimal code	ESC	D ~ d	Parameter
	$<1B>_{16}$	$<44>_{16}$ ~ Character type	abbcccn~n + <d>n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying character type of human readable information (HRI) for barcode.

[Format]

<D>abbcccn~n + <d>n~n

●Parameter

a[Barcode symbology] = 3 : JAN/EAN13
4 : JAN/EAN8
H : UPC-A

b[Narrow bar width] = Valid range : 01 to 36 dots

c[Height of barcode] = Valid range : 01 to 999 dots

n[Print data] = Barcode data

d[Character type specification] = OA
OB
XU
XS
XM
XB
XL
U
S
M
WB
WL

n[Print data] = HRI data

[Coding Example] Barcode symbology : EAN13 Narrow bar width : 03 Height of barcode: : 120
Barcode data : 4902471000793 Character type : XU
HRI data : 4902471000793

<A>
<V>100<H>200**<D>3031204902471000793**
<XU>4902471000793
<Q>2
<Z>



[Notes]

1. Adds HRI with specified character type.
2. When the data other than specified value is set, printing will not be performed. When the barcode enlargement ratio is small and character type is large, HRI may be overlapped with each other.
3. The printer will lay out HRI properly.
4. HRI for JAN/EAN8, JAN/EAN13 and UPC-A requires the following terms.
   For 8 dots/mm (203 dpi), [02] and [03] would be a proper value of narrow bar width.
   For 12 dots/mm (305 dpi), [03] and [04] would be a proper value of narrow bar width.
   For 24 dots/mm (609 dpi), [06], [07] and [08] would be a proper value of narrow bar width.
5. HRI will not be printed when barcode is an error for barcode with HRI.
6. When <P> or <L> is specified(<P>02<d>n～n、<L><d>n～n), HRI will not be printed.

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9.4 Barcode

Barcode (Ratio 2:5)	ESC+BD

Hexadecimal code	ESC	BD	Parameter
	$<1B>_{16}$	$<42>_{16}<44>_{16}$	abbcccn～n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between items	The parameter preset will be invalid.

[Function]

Specifying the barcode of narrow and wide bar width ratio 2:5.

[Format]

<BD>abbcccn~n

●Parameter

a[Barcode symbology] = Refer to the table below
b[Narrow bar width] = Valid range : 01 to 36 dots
c[Height of barcode] = Valid range : 001 to 999 dots
n[Print data] = Data

Barcode symbology (Ratio of module composition may not be available depending on the barcode symbology.)

A	Barcode symbology	Descriptions	Ratio
0	CODABAR (NW-7)	Set print data including Start/Stop Character. Start/Stop Characters are [A,B,C,D,E,N,T,a,b,c,d,e,n,t]. However, the reading result of [E, N, T, a, b, c, d, e, n, t] will be [D, B, A, A, B, C, D, D, B, A.] e.g.) When barcode print data is [123], specify [A123A]. Barcode character pitch is enabled. Refer to the code list of the CODEBAR(NW-7) for the print data.	2:5
1	CODE39	Set print data including Start/Stop Character. Start/Stop Character is [*]. e.g.) When barcode print data is [12345], specify [*12345*]. Barcode character pitch is enabled. Refer to the code list of the CODE39 for the print data.	2:5
2	ITF	Specify print data in even-numbered digit. If specifying in odd-numbered digit, “0” will be added to the head of print data. Refer to the code list of the ITF for the print data.	2:5
3	JAN/EAN13	The barcode will have a guard bar and HRI. Refer to the code list of the JAN/EAN13 for the print data.	Fixed
4	JAN/EAN8	The barcode will have a guard bar and HRI. Refer to the code list of the EAN8 for the print data.	Fixed
5	Industrial 2 of 5	Barcode character pitch is enabled. Refer to the code list of the Industrial 2of5 for the print data.	2:5
6	Matrix 2 of 5	Barcode character pitch is enabled. Refer to the code list of the Matrix 2of5 for the print data.	2:5
H	UPC-A	The barcode will have a guard bar and HRI. Refer to the code list of the UPC-A for the print data.	Fixed

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[Coding Example 1] Barcode symbology : CODABAR(NW-7) Narrow bar width : 03 Height of barcode : 120
Print data : A1234A

```
<A>
<V>100<H>100<BD>003120A1234A
<Q>2
<Z>
```



[Coding Example 2] Barcode symbology : ITF Narrow bar width : 03 Height of barcode : 120
Print data : 98002345678163

```
<A>
<V>100<H>100<BD>20212098002345678163
<Q>2
<Z>
```



[Coding Example 3] Barcode symbology : UPC-A Narrow bar width : 03 Height of barcode : 120
Print data : 20123948573

```
<A>
<V>240<H>100<BD>H0312020123948573
<Q>2
<Z>
```



[Notes]

1. Barcode character pitch is available for CODABAR(NW-7), CODE39, Industrial 2 of 5, and Matrix 2 of 5. To specify barcode character pitch, insert Character Pitch <P> right before barcode symbology.
   When <P> is omitted, character pitch will be as same as narrow space width.

Command	Ratio	Narrow space width	<P> specification	Character pitch	
				Narrow bar width is 1	Narrow bar width is 2
<BD>	2:5	2	Nil	2	4
			<P>0	2	4
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. Refer to the code list of each barcode for the print data.
3. The below condition is necessary for the HRI of JAN/EAN8, JAN/EAN13 and UPC-A.
   The head density is 203dpi(8dots/mm): HRI is printed only when the narrow bar is [02] and [03]
   The head density is 305dpi(12dots/mm): HRI is printed only when the narrow bar is [03] and [04]
   The head density is 609dpi(24dots/mm): HRI is printed only when the narrow bar is [06], [07] and [08]
   Automatic HRI printing is will not be implemented when the value other than above is specified.

[Remarks]

1. If the value other than valid range is set, command error will occur and barcode will not be printed.
2. A barcode that exceeds the printable area will not be printed.
3. Increasing the narrow bar width may exceed the print area.
4. The scanner may not read the barcode with a valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. Specify the narrow bar width by considering the scanner readability and the head density.
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. If the Start / Stop character is not included in print data at the time of CODABAR(NW-7) or CODE39 specification, the printing of barcode will be performed; however, the scanner can not read it.
8. If sending the print data including check digit at the time of JAN/EAN13 or JAN/ EAN8 specification, set the correct calculated value.
   The barcode will be printed even when the data includes improper check digit; however, the scanner can not read it.

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9.5 Barcode

Registration of Bar Width Ratio

ESC+BT

Hexadecimal code	ESC	BT	Parameter
	$<1B>_{16}$	$<42>_{16}<54>_{16}$	abbccddee
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specifying the bar width ratio of narrow and wide bars.

[Format]

<BT>abbccddee

●Parameter

a[Barcode symbology] = 0 : CODABAR(NW-7)
1 : CODE39
2 : ITF
5 : Industrial 2 of 5
6 : Matrix 2 of 5

b[Narrow space] = Valid range : 01 to 99 dots

c[Wide space] = Valid range : 01 to 99 dots

d[Narrow bar] = Valid range : 01 to 99 dots

e[Wide bar] = Valid range : 01 to 99 dots

[Coding Example] Barcode symbology : CODE39 Narrow space : 03 Wide space : 05
Narrow bar : 03 Wide bar : 05

<A>
<BT>103050305
<V>100<H>200<BW>01233*ABCD*
<Q>2
<Z>



[Notes]

1. To print barcode with specified ratio, insert Print of Barcode with Registered Ratio <BW> after this command.
2. When <BW> and Print Quantity <Q> are not specified, only the registration of bar width ratio of narrow and wide bars will be performed.
3. Only one ratio can be registered.
4. If the data other than specified is set, this will not be registered due to command error.

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9.6 Barcode

Print of Barcode with Registered Ratio

ESC+BW

Hexadecimal code	ESC	BW	Parameter
	$<1B>_{16}$	$<42>_{16}<57>_{16}$	aabbbn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the barcode registered with Registration of Bar Width Ratio <BT>.

[Format]

<BW>aabbbn~n

●Parameter

a[Narrow bar width] = Valid range : 01 to 36 dots
b[Height of barcode] = Valid range : 001 to 999 dots
n[Print data] = Barcode data

[Coding Example] Narrow bar width : 02 Height of barcode : 120

<A>
<BT>103060306
<V>100<H>200**<BW>02120*ABCD***
<Q>2
<Z>



[Notes]

1. Barcode character pitch is available for CODABAR(NW-7), CODE39, Industrial 2 of 5, and Matrix 2 of 5.
   To specify barcode character pitch, insert Character Pitch <P> right before barcode symbology.
   When <P> is omitted, character pitch will be as same as narrow space width.

Command	Ratio	Narrow space width	<P> specification	Character pitch	
				Narrow bar width is 1	Narrow bar width is 2
<BT>	3:5	3	Nil	3	6
			<P>0	3	6
			<P>1	1	2
			<P>2	2	4
			<P>3	3	6
			<P>4	4	8

2. If there is no Registration of Bar Width Ratio <BT>, barcode based on pre-registered bar width ratio of narrow and wide bars will be printed. Note that specification of <BT> is required beforehand to print.
3. Refer to the code list of each barcode for the print data.

[Remarks]

1. If the value other than valid range is set, command error will occur and barcode will not to be printed.
2. A barcode that exceeds the printable area will not be printed.
3. When narrow bar is enlarged, the barcode may exceed the printable area and may not be printed.
4. The scanner may not read the barcode with a valid character pitch when Character Pitch <P> is increased.
   Also, increasing the narrow bar width may cause the same type of problem. For more information, refer to the documentation of your scanner.
5. Specify the narrow bar width by considering the scanner readability and the head density.
6. Adjust Print Speed <CS> or Print Darkness <#F> in case of scanner reading problem.
7. If the Start / Stop character is not included in print data at the time of CODABAR(NW-7) or CODE39 specification, the printing of barcode will be performed; however, the scanner can not read it.

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CODABAR(NW-7) - Code Table

					S								S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1	A		a									
0	0	1	0	**2**				2	B		b									
0	0	1	1	**3**				3	C		c									
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**				5	E		e									
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**			*	:												
1	0	1	1	**B**			+													
1	1	0	0	**C**																
1	1	0	1	**D**			-													
1	1	1	0	**E**			.		N		n									
1	1	1	1	**F**			/													

* 0x20(SP) cannot be used, however, an error will not occur when it is specified and black will be printed.

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CODE39 - Code Table

					S					I				S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0		P										
0	0	0	1	**1**				1	A	Q										
0	0	1	0	**2**				2	B	R										
0	0	1	1	**3**				3	C	S										
0	1	0	0	**4**			$	4	D	T										
0	1	0	1	**5**			%	5	E	U										
0	1	1	0	**6**				6	F	V										
0	1	1	1	**7**				7	G	W										
1	0	0	0	**8**				8	H	X										
1	0	0	1	**9**				9	I	Y										
1	0	1	0	**A**			*		J	Z										
1	0	1	1	**B**			+		K											
1	1	0	0	**C**					L											
1	1	0	1	**D**			-		M											
1	1	1	0	**E**			.		N											
1	1	1	1	**F**			/		O											

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9.7 Barcode

GS1-128 (UCC/EAN128) (Standard Carton ID Only)

ESC+BI

Hexadecimal code	ESC	BI	Parameter
	$<1B>_{16}$	$<42>_{16}<49>_{16}$	aabbbcn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying GS1-128(UCC/EAN128) barcode for Standard Carton ID.

[Format]

<BI>aabbbcn～n

●Parameter

a[Narrow bar width] = Valid range : 01 to 36 dots

b[Height of barcode] = Valid range : 001 to 999 dots

c[Barcode expository font specification]= 0 :No HRI
1 :HRI is available (Top of barcode)
2 : HRI is available (Bottom of barcode)

n[Print data] = Barcode data (Fixed 17 digits)

Refer to the code list of the GS1-128(UCC/EAN128) for the print data.

EAN128(Barcode for standard carton ID)
- Identifier of sequence code for transportation container
- Package type
- Country code, manufacturer code
- Sequence number of shipment container
- C/D

* Specify the 17 digit data without C/D because C/D is automatically added.

[Coding Example 1] Narrow bar width: 05, barcode height: 080, HRI: yes (in the bottom)
Print data: 12345678901234567

<A>
<V>100<H>200**<BI>0508021234567890123456 7**
<Q>2
<Z>



[Coding Example 2] Narrow bar width: 04, barcode height: 150, HRI: no
Print data: 123456789+ calendar data(refer to the enhanced calender printing <WU>)

<A>
<V>100<H>200
<BI>041500<WU>123456789>ZDDMMYYhh>Z
<Q>2
<Z>

[Notes]

1. This is UCC128 code only for the standard carton ID. When printing EAN128 that is used for medical services, fresh products, and horticultures, please specify the application identifier according to the application, or specify the print data by separators by using CODE128 barcode command <BG>.
2. Start character code, function character, end character code and identifier(only "00" is supported) are automatically added.
3. Modulus10 check character and modulus 103 check character are automatically produced.
4. Sequential numbering of the barcode data is available.
5. The line pitch between barcode and HRI font is fixed to 10 dots.
6. When the width of the HRI is wider than the barcode width, the HRI is printed from the print start position of the barcode.
7. When the width of the HRI is narrower than the barcode width, the HRI is printed in the center position of the barcode.
8. The font type of the HRI is OCR-B.
9. When the HRI exceeded the printable area, it will not be printed. When barcode with HRI is specified, specify the vertical position <V> and horizontal position <H> by considering the HRI printing.
10. When other than 0, 1, or 2 is specified as the barcode HRI font, it will be the same as the barcode HRI font specification "0".

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ITF
Matrix 2of5
Industrial 2of5
UPC-A、EAN8
EAN13、UPC-E
GS1-128 (UCC/EAN128)
MSI code list

					S								S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

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9.8 Barcode

CODE93 Barcode

ESC+BC

Hexadecimal code	ESC	BC	Parameter
	$<1B>_{16}$	$<42>_{16}<43>_{16}$	aabbbccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying CODE93 barcode.

[Format]

<BC>aabbbccn～n

●Parameter

a[Narrow bar width] = Valid range : 01 to 36 dots
b[Height of barcode] = Valid range : 001 to 999 dots
c[Digit No. of data] = Valid range : 01 to 99
n[Print data] = Barcode data (Refer to the CODE93 - Code Table)

[Coding Example] Narrow bar width : 02 Height of barcode : 120 Digit No : 12 Print data : ABCD123456xy

<A>
<V>100<H>200**<BC>0212012ABCD123456xy**
<Q>2
<Z>



[Notes]

1. C/D is an auto-generation.
2. Start code and stop code is automatically added.
3. Maximum entry digit number of data is 99.
4. [Digit No. of data] and No. of input data has to be equal.
5. Command error will occur when No. of input data and [Digit No. of data] is not matching.

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CODE93 - Code Table

					S								S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	-								
1	1	1	1	**F**			/	?	O	_	o	DEL								

"00H to 7FH" are available in CODE93.

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9.9 Barcode

CODE128 (128A, 128B, 128C) Barcode

ESC+BG

Hexadecimal code	ESC	BG	Parameter
	<1B>16	<42>16<47>16	aabbbn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying CODE128 barcode.

[Format]

<BG>aabbbn~n

●Parameter

a[Narrow bar width] = Valid range : 01 to 36 dots
b[Height of barcode] = Valid range : 001 to 999 dots
n[Print data] = Barcode data (Refer to the CODE128 - Code Table)

[Coding Example] Narrow bar width : 02 Height of barcode : 120 Print data : ABCD123456 (START CODE A)

<A>
<V>100<H>200**<BG>02120>GABCD123456**
<Q>2
<Z>



[Notes]

1. Specify [START CODE] at the head of print data.
   (1) START CODE A = [>G]
   (2) START CODE B = [>H]
   (3) START CODE C = [>I]
2. C/D is an auto-generation.
3. (1) When using “START CODE C”, specify print data in even-numbered digit.
   (2) When “START CODE C” is set to print data in odd - number digits, specify “START CODE A” or “B” to change the first one character of print data. And then specify the rest of data with “Code Set Character C” to change it to even-numbered digit.
   e.g.1) 15 digits [123456789012345] <B>1<C>23456789012345.
   e.g.2) 9 digits / Alphanumeric 6 digits [123456789ABC123] <C>12345678<B>9ABC123.
   (3) If using “START CODE C” to specify odd-numbered digit, “0” will be added to the tail of print data before printing.
   (4) Note that when the compatible mode is on and specify odd-numbered digit with START CODE C, "0" will be added to the tail of the print data and printed.
   (5) When start character is omitted, data will be printed with “START CODE B”.

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CODE128 - Code Table

VALUE	Code A	Code B	Code C
0	SP	SP	00
1	!	!	01
2	”	”	02
3	#	#	03
4	$	$	04
5	%	%	05
6	&	&	06
7	’	’	07
8	(	(	08
9	)	)	09
10	*	*	10
11	+	+	11
12	,	,	12
13	-	-	13
14	.	.	14
15	/	/	15
16	0	0	16
17	1	1	17
18	2	2	18
19	3	3	19
20	4	4	20
21	5	5	21
22	6	6	22
23	7	7	23
24	8	8	24
25	9	9	25
26	:	:	26
27	;	;	27
28	<	<	28
29	=	=	29
30	> [Important] - 4	> [Important] - 4	30
31	?	?	31
32	@	@	32
33	A	A	33
34	B	B	34
35	C	C	35
36	D	D	36
37	E	E	37
38	F	F	38
39	G	G	39
40	H	H	40
41	I	I	41
42	J	J	42
43	K	K	43
44	L	L	44
45	M	M	45
46	N	N	46
47	O	O	47
48	P	P	48

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VALUE	Code A	Code B	Code C
49	Q	Q	49
50	R	R	50
51	S	S	51
52	T	T	52
53	U	U	53
54	V	V	54
55	W	W	55
56	X	X	56
57	Y	Y	57
58	Z	Z	58
59	[	[	59
60	╱	╱	60
61	]	]	61
62	^	^	62
63	_	_	63
64	NUL >SP	` >SP	64
65	SOH > !	a > !	65
66	STX >”	b >”	66
67	ETX >#	c >#	67
68	EOT >$	d >$	68
69	ENQ >%	e >%	69
70	ACK >&	f >&	70
71	BEL >’	g >’	71
72	BS >(	h >(	72
73	HT >)	i >)	73
74	LF >*	j >*	74
75	VT >+	k >+	75
76	FF >,	l >,	76
77	CR >-	m >-	77
78	SO >.	n >.	78
79	SI >/	o >/	79
80	DLE >0	p >0	80
81	DC1 >1	q >1	81
82	DC2 >2	r >2	82
83	DC3 >3	s >3	83
84	DC4 >4	t >4	84
85	NAK >5	u >5	85
86	SYN >6	v >6	86
87	ETB >7	w >7	87
88	CAN >8	x >8	88
89	EM >9	y >9	89
90	SUB >:	z >:	90
91	ESC > ;	{ > ;	91
92	FS ><	| ><	92
93	GS >=	} >=	93
94	RS >>	~ >>	94
95	US > ?	DEL > ?	95
96	FNC3 >@	FNC3 >@	96
97	FNC2 >A	FNC2 >A	97

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VALUE	Code A	Code B	Code C
98	SHIFT >B	SHIFT >B	98
99	Code-C >C	Code-C >C	99
100	Code-B >D	FNC4 >D	Code-B >D
101	FNC4 >E	Code-A >E	Code-A >E
102	FNC1 >F	FNC1 >F	FNC1 >F
103	START CODE A >G		
104	B >H		
105	C >I		

[Important]

1. Send [START CODE] by all means.
2. [STOP CODE] will be automatically added in the internal printer.
3. For the specification of code higher than Value 64 in Code A and Code B, specify it as a two-character code with the addition of [>].
4. Specification code [>] is described as [>J].

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9.10 Barcode

POSTNET	ESC+BP

Hexadecimal code	ESC	BP	Parameter
	$<1B>_{16}$	$<42>_{16}<50>_{16}$	n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying Postnet.

[Format]
<BP>n~n

●Parameter
n = Print data(refer to the POSTNET code table)
Note that the digits other than specified below are not allowed.
- 5 digits (Postnet-32 format)
- 6 digits (Postnet-37 format)
- 9 digits (Postnet-52 format)
- 11 digits (Postnet-62 Delivery Point format)

[Coding Example] Postal code : 11 digits: 01234567890
<A>
<V>100<H>200**<BP>01234567890**
<Q>2
<Z>

[Notes]
1. If specifying the value other than 5, 6, 9, and 11 digits for print data, it will be ignored.
2. Only numeric can be specified as print data. Refer to the Postnet - Code Table.

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POSTNET - Code Table

					S				I				S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

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9.11 Barcode

UPC add-on Code(BOOKLAND)

ESC+BF

Hexadecimal code	ESC	BF	Parameter
	$<1B>_{16}$	$<42>_{16}<46>_{16}$	aabbbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify UPC add-on code (BOOKLAND)

[Format]

<BF>aabbbn~n

●Parameter

a[Narrow bar width] = Valid range : 01 to 36 dots
b[Height of barcode] = Valid range : 001 to 999 dots
n[Print data] = Numeric (0 to 9) : 2, 5 digits

[Coding Example] Narrow bar width : 03 Height of barcode : 120

<A>
<H>325<V>725<BD>H0315009827721123
<H>640<V>760**<BF>0312021826**
<H>655<V>730<OB>21826
<Q>1
<Z>



[Notes]

1. Barcode that other than 2-digit or 5 digit are specified will not be printed.
2. Only numeric can be specified as print data. Refer to the Bookland - Code Table.
3. There is no auto HRI specification.
4. When UPC Add-on code <BF> only is printed, it will not be readable.
   It is readable only when UPC Add-on is printed with UPC code.

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UPC Add-on barcode - Code Table

					S								S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

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9.12 Barcode

UPC-A Barcode (Without HRI)

ESC+BL

Hexadecimal code	ESC	BL	Parameter
	$<1B>_{16}$	$<42>_{16}<4C>_{16}$	aabbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Adjusting the barcode character height of the first and the last digits to the same as that of guide bar.

[Format]

<BL>abbcccn~n

●Parameter

a[Barcode symbology] = H : UPC-A ('H' fixed)
b[Narrow bar width] = Valid range : 01 ~ 36 dots
c[Height of barcode] = Valid range : 001 ~ 999 dots
n[Print data] = Data : 11 fixed digits *1

*1 The data input digit for UPC-A is only 11 digits, however, the specified data is printed without check digit calculation when 12 digits
are specified. (Closed to the users)

[Coding Example] Barcode symbology : UPC-A Narrow bar width : 03 Height of barcode : 120
Print data : 01234567890

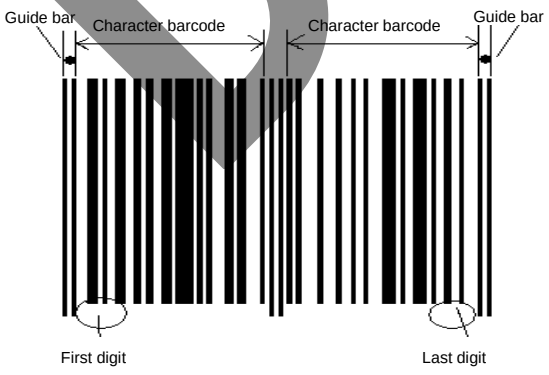
<A>
<H>100<V>100**<BL>H0312001234567890**
<Q>2
<Z>

[Notes]

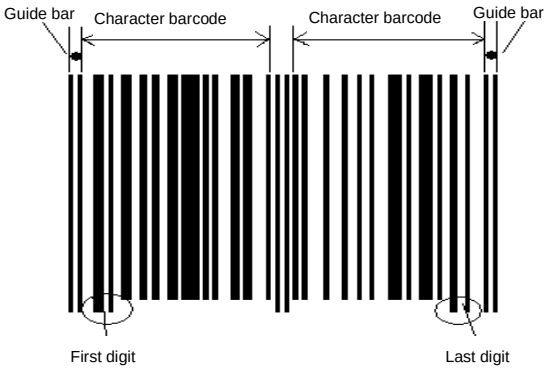
1. This command supports UPC-A only. When setting [Barcode symbology] to the value other than 'H', command error will occur.
2. Settings for guide bar, HRI and Ratio are as follows.

Guide bar	HRI	Ratio
Available	Not available	Fixed

3. The operation when invalid parameters are specified is not guaranteed.
4. The height of the character barcode is the same when printing UPC-A by using barcode command <D>, however, the height of the first digit and the last digit of the character code will be the same as the guide bar when printing with UPC-A barcode command <BL>.



Print result by barcode command <D>



Print result by UPC-A barcode command <BL>

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9.13 Barcode

UPC-A Barcode (Selection of HRI)

ESC+BL ~ ESC+d

Hexadecimal code	ESC	BL~	Parameter
	$<1B>_{16}$	$<42>_{16}<4C>_{16}$~ Character type	abbcccn~n~<d>n~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Adjusting the barcode character height of the first and the last digits to the same as that of the guide bar.

[Format]

<BL>abbcccn~n ~ <d>n~n

●Parameter

a[Barcode symbology]	=	H	: UPC-A ('H' fixed)
b[Narrow bar width]	=	Valid range	: 01 to 36 dots
c[Height of barcode]	=	Valid range	: 001 to 999 dots
n[Print data]	=	Data	: 11 fixed digits *1
d[Character type specification]	=	OA	
		OB	
		XU	
		XS	
		XM	
		XB	
		XL	
		U	
		S	
		M	
		WB	
		WL	
n[Print data]	=	HRI data :	12 fixed digits

*1 The data input digit for UPC-A is only 11 digits, however, the specified data is printed without check digit calculation when 12 digits are specified. (Closed to the users)

[Coding Example] Barcode symbology : UPC-A Narrow bar width : 02 Height of barcode : 120
Barcode data : 01234567890 Character type : XS HRI data : 01234567890

<A>
<H>100<V>100**<BL>H0212001234567890**
<XS>01234567890
<Q>2
<Z>

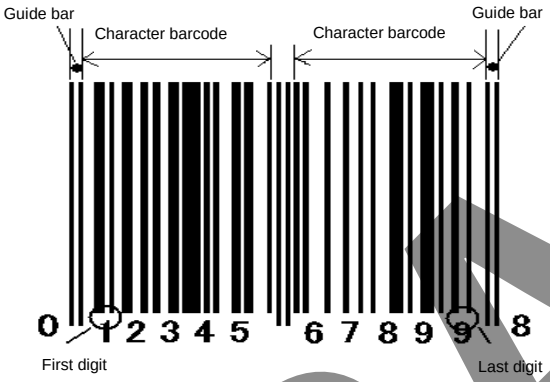
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[Notes]

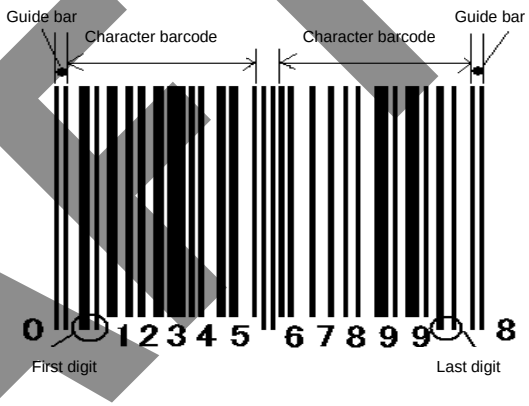
1. This command supports UPC-A only. When setting [Barcode symbology] to the value other than ‘H’, command error will occur.
2. HRI requires the following terms.
   For 8 dots/mm, [02] and [03] would be a proper value of narrow bar width.
   For 12 dots/mm, [03] and [04] would be a proper value of narrow bar width.
   For 24 dots/mm, [06], [07] and [08] would be a proper value of narrow bar width.
3. Please set the correct calculation for the check digit that is the 12th digit of the HRI data by using modulus10.
4. Settings for guide bar, HRI and Ratio are as follows.

Guide bar	HRI	Ratio
Available	Available	Fixed

5. The operation when invalid parameters are specified is not guaranteed.
6. HRI will not be printed when barcode is an error for barcode with HRI.
7. The height of the character barcode is the same when printing UPC-A by using barcode command <D> followed by <character type> data, however, the height of the first digit and the last digit of the character code will be the same as the guide bar when printing with UPC-A barcode command <BL> followed by <character type> data. Also, HRI can be printed from below the first digit to the last digit because the height of the barcode is shorter when printing UPC-A by using barcode command <D> followed by <character type> data, however, the print area of HRI will be narrower compared to the barcode command <d> followed by <character type> data when printing UPC-A with UPC-A barcode command <BL> followed by <character type> data because the first digit and the last digit's height is longer.



Print result of UPC-A of barcode command <D> followed by <character type> data



Print result of UPC-A of UPC-A barcode command <BL> followed by <character type> data

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9.14 Barcode

UPC-A Barcode (With HRI)

ESC+BM

Hexadecimal code	ESC	BM	Parameter
	$<1B>_{16}$	$<42>_{16}<4D>_{16}$	abbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Adjusting the barcode character height of the first and the last digits to the same as that of the guide bar.

[Format]

<BM>abbcccn~n

●Parameter

a[Barcode symbology] = H : UPC-A ('H' fixed)
b[Narrow bar width] = Valid range : 01 to 36 dots
c[Height of barcode] = Valid range : 001 to 999 dots
n[Print data] = Data : 11 fixed digits *1

*1 The data input digit for UPC-A is only 11 digits, however, the specified data is printed without check digit calculation when 12 digits are specified. (Closed to the users)

[Coding Example] Barcode symbology : UPC-A Narrow bar width : 02 Height of barcode : 120
Print data : 20123948573

<A>
<H>100<V>100**<BM>H0212020123948573**
<Q>2
<Z>

[Notes]

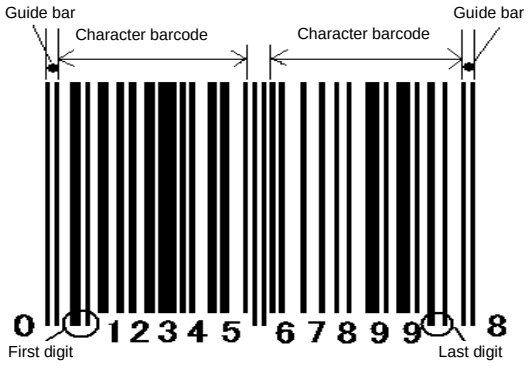
1. This command supports UPC-A only. When setting [Barcode symbology] to the value other than 'H', command error will occur.
2. HRI requires the following terms.
   For 8 dots/mm, [02] and [03] would be a proper value of narrow bar width.
   For 12 dots/mm, [03] and [04] would be a proper value of narrow bar width.
   For 24 dots/mm, [06], [07] and [08] would be a proper value of narrow bar width.
   Automatic HRI printing is will not be implemented when the value other than above is specified.
3. Settings for guide bar, HRI and Ratio are as follows.

Guide bar	HRI	Ratio
Available	Available	Fixed

4. The operation when invalid parameters are specified is not guaranteed.
5. The height of the character barcode is the same when printing UPC-A by using barcode command <BD>, however, the height of the first digit and the last digit of the character code will be the same as the guide bar when printing with UPC-A barcode command <BM>. Also, HRI can be printed from below the first digit to the last digit because the height of the barcode is shorter when printing UPC-A by using barcode command <BD> , however, the print area of HRI will be narrower when printing UPC-A with UPC-A barcode command <BM> because the first digit and the last digit's height is longer.



Print result by barcode command <BD>



Print result by UPC-A barcode command <BM>

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9.15 Barcode

Composite Symbol

ESC+EU

Hexadecimal code	ESC	EU	Parameter
	$<1B>_{16}$	$<45>_{16}<55>_{16}$	aabb(cc)(ddd) n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify composite symbol EAN and UCC.

[Format 1]

<EU>aabbccn～n

●Parameter

a [Composite symbol] = 01 : GS1 DataBar Composite (CC-A/CC-B)
02 : GS1 DataBar Truncated Composite (CC-A/CC-B)
03 : GS1 DataBar Stacked Composite (CC-A/CC-B)
04 : GS1 DataBar Stacked Omni-Directional (CC-A/CC-B)
05 : GS1 DataBar Limited Composite (CC-A/CC-B)
06 : GS1 DataBar Expanded Composite(CC-A/CC/B)
/ GS1 DataBar Expanded Stacked (CC-A/CC-B)
07 : UPC-A Composite (CC-A/CC-B)
08 : UPC-E Composite (CC-A/CC-B)
09 : EAN13 Composite (CC-A/CC-B)
10 : EAN8 Composite (CC-A/CC-B)

b [Narrow bar width] = 01 ~ 12 (dots)

c [Segment width] = 02 ~ 22 (even numbers only)
* Supported only for DataBar Expanded Composite (CC-A/CC-B)

n [Print data] = data

The maxim digit available for 1D data

GS1 DataBar Composite (CC-A/CC-B)	13 digits
GS1 DataBar Truncated Composite (CC-A/CC-B)	13 digits
GS1 DataBar Stacked Composite (CC-A/CC-B)	13 digits
GS1 DataBar Stacked Omni-Directional (CC-A/CC-B)	13 digits
GS1 DataBar Limited Composite (CC-A/CC-B)	13 digits
GS1 DataBar Expanded Composite (CC-A/CC-B) / GS1 DataBar Expanded Stacked (CC-A/CC-B)	74 digits
UPC-A Composite (CC-A/CC-B)	11 digits
UPC-E Composite (CC-A/CC-B) Specify the 1D data in the format of "XX00000XXX"(X is variables).	Fixed to 10 digits
EAN13 Composite (CC-A/CC-B)	12 digits
EAN8 Composite (CC-A/CC-B)	7 digits

* Check digit is automatically calculated and added.
* Separate the 1D data and 2D data with '|'(7CH) when specifying composite symbol printing.
  Data = 1D data| 2D data
* It is necessary to specify the data of GS1 DataBar Composite (CC-A/CC-B) in 1 to 16 digits of the GS1 DataBar Expanded Composite (CC-A/CC=B).
* It is possible to input up to 74 digits for numeric and up to 41 digits for alphabet including the data of GS1 DataBar Composite (CC-A/CC-B) for the GS1 DataBar Expanded Composite (CC-A/C-B).
  (It is possible to input up to 41 digits for alphanumeric including GS1 DataBar Composite (CC-A/CC-B) data)
* 0 is added before the data when the specified data are less than the maximum digit for 1D data.
* It is possible to input up to 338 digits for 2D data, however, the maximum input digit varies depending on the barcode type.
* The barcode may exceed the printable area depending on the data or data digit. The barcode may not be read in that case. Please adjust the data so that the whole barcode can be printed in the printable area.
* The input digit of the UPC-A Composite is 11 digits only, however, EAN14 Composite (CC-A/CC-B) will be printed when 12 digits has been input to maintain compatibility.

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[Format 2]
<EU>aabbcccn～n

●Parameter

a[Composite symbol] = 11 : GS1-128 Composite (CC-A/CC-B)
12 : GS1-128 Composite (CC-C)
b[Narrow bar width] = 01 ~ 12 (dots)
c[Barcode height] = 001 ~ 500 (dots)

* Specify the barcode height when the narrow bar width is 01.
The barcode height will be 300 dots when the narrow bar is 03, and barcode height is 100.

n[Print data] = barcode data (up to 236 digits for 1D and 2D data together)

The maximum digit available for 1D and 2D data (however, there is a limitation for the maximum digit for 1D data)

GS1-128（UCC/EAN128） with CC-A/B	338 digits
GS1-128（UCC/EAN128） with CC-C	2361 digits

The maxim digit available for 1D data

GS1-128（UCC/EAN128） with CC-A/B	48 digits
GS1-128（UCC/EAN128） with CC-C	48 digits

* Separate the 1D data and 2D data with '|'(7CH) when specifying composite symbol printing.
Data = 1D data| 2D data
* Please use '#'(23H) when specifying CC-A/B(MicroPDF) or CC-C(PDF417) as the FNC1(GS).
* The 2D data of GS1-128(UCC/EAN128) With CC-A/B can input up to 338 digits.
* When the 2D data of the GS1-128(UCC/EAN128) With CC-A/B is less than 56 digits, it will be CC-A automatically, and it will be CC-B when it is 57 to 338 digits.
* The digit varies depending on the width of the barcode in GS1-128(UCC/EAN128) With CC-C, and the maximum digit of the 1D and 2D is 2361 digits.

[Coding Example 1] When using GS1 DataBar Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>01040361234567890|11990102
<Q>1
<Z>



[Coding Example 2] When using GS1 DataBar Truncated Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>02040361234567890|11990102
<Q>1
<Z>



[Coding Example 3] When using GS1 DataBar Stacked Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>03040341234567890|17010200
<Q>1
<Z>



[Coding Example 4] When using GS1 DataBar Stacked Omni-Directional (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>04040341234567890|17010200
<Q>1
<Z>



[Coding Example 5] When using GS1 DataBar Limited Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>05040351234567890|21ABCDEFGHIJKLMNOPQRSTUV
<Q>1
<Z>



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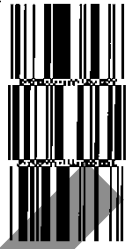
[Coding Example 6] When using GS1 DataBar Expanded Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>0605220104912345678904
<Q>1
<Z>



[Coding Example 7] When using GS1 DataBar Expanded Stacked (CC-A/CC-B) commar

<A>
<V>100<H>100
<EU>06050201049123456789O4
<Q>1
<Z>



[Coding Example 8] When using UPC-A Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>0704331234567890|991234-abcd
<Q>1
<Z>



[Coding Example 9] When using UPC-E Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>08041200000123|15021231
<Q>1
<Z>



[Coding Example 10] When using EAN13 Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>0904331234567890|991234-abcd
<Q>1
<Z>



[Coding Example 11] When using EAN8 Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>10041234567|21A12345678
<Q>1
<Z>



[Coding Example 12] When using GS1-128 Composite (CC-A/CC-B) command

<A>
<V>100<H>100
<EU>1104026010321234567890 6|21A1B2C3D4E5F6G7H8
<Q>1
<Z>



[Coding Example 13] When using GS1-128 Composite (CC-C) command

<A>
<V>100<H>100
<EU>12040260003012345678901234O|02130123456789
093724#101234567ABCDEFG
<Q>1
<Z>



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[Notes]

1. The format of the parameter varies depending on the 1D barcode type. The segment width can be specified only with DataBar Expanded Composite(CC-A/CC-B) (EU06).
   The barcode height parameter can be specified only with GS1-128(UCC/EAN-128)(EU11, EU12).
2. Composite symbol will not be printed when the data matched to the composite symbol is not set to the data.
3. The print data parameter can be input up to 2361 digits for 1D data and 2D data, however, the data can be specified as 2D data vary according to the 1D barcode type, and conditions such as the alphabet and numeric is mixed in the data. The barcode may not be printed correctly when data exceeded the maximum digit.
4. The size of the composite symbol changes depending on the width of the narrow bar.
5. When the composite symbol exceeded the printable area, the part within the printable area will be printed. The composite symbol may be read correctly by the scanner.
6. According to the specification of composite symbol, the height and width of the 2D code are adjusted by the 1D barcode data. When the width of the 1D barcode is not enough, the composite barcode may not be printed even the data are less than the maximum digit.
7. HRI printing can not be specified with this command.
8. The rotation command <%> is available, but enlarge command <L> is disabled.
9. Please specify a correct value for YYMMDD when specifying 11(manufactured date), 12(due date for payment), 13(packed date), 15(sell-by date), and 17(warranty date) for application identifier. The print result is not guaranteed when the correct value is not input.
10. Please specify the 2D code data according to the format of the application identifier when GS1 Databar is specified as the barcode type.
11. GS1 DataBar Expanded Composite(CC-A/CC-B) is automatically stacked according to the segment width and data size, and printed as GS1 DataBar Expanded Stacked(CC-A/CC-B).
12. The generation module has been changed for the quality improvement. The generated image may be different, however, the reading result is the same.

Composite symbol 2D code-Code Table

					S			I					S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0		P		p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**				3	C	S	c	s								
0	1	0	0	**4**				4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K		k									
1	1	0	0	**C**			,	<	L		l									
1	1	0	1	**D**			-	=	M		m									
1	1	1	0	**E**			.	>	N		n									
1	1	1	1	**F**			/	?	O	__	o									

* Please use '#'(23H) when specifying FNC1.

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9.16 Barcode

USPS Barcode

ESC+BS

Hexadecimal code	ESC	BS	Parameter
	$<1B>_{16}$	$<42>_{16}<53>_{16}$	aabbbccccccddddddddde～e
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
USPS code is printed.

[Format]
<BS>aabbbccccccddddddddd(e～e)

●Parameter
a[Barcode ID] = Fixed to 2 digits
* Specify 0 to 4 for the second digit.
b[Service Type ID] = Fixed to 3 digits
c[Mailer ID] = Fixed to 6 digits
d[Serial Number] = Fixed to 9 digits
e[Routing Code] = Fixed to 5 digits, 9 digits, or 11 digits(Omissible)

[Coding Example] Barcode ID : 53, Service Type ID : 379, Customer Identifier : 777234
Serial Number: 994544928, Routing Code : 51135759461
<A>
<V>100<H>200**<BS>5337977723499454492851135759461**
<Q>1
<Z>

[Note]
Refer to the USPS code table on the next page for the valid parameter.

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USPS code-Code Table

					S			I					S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

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10 2D code command

10.1 2D Code

PDF417	ESC+2D10

Hexadecimal code	ESC	2D10	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<31>_{16}<30>_{16}$	,aa,bb,c,dd,ee(,f)
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying PDF417 of 2D code.

[Format] (For setup)
<2D10>,aa,bb,c,dd,ee(,f)

●Parameter

a[Minimum module width] = Valid range: 01~27 (dots)
b[Minimum module height] = Valid range: 01~72 (dots)
c[Security level] = Valid range: 0~8
d[Number of data codeword per 1 line] = Valid range: 01~30
00 : Auto(the width size varies depending on the specified number of data)
e[Lines per a symbol] = Valid range: 03~90
00 : Auto(the height size varies depending on the specified number of data)
f [Code type] = 0 : Normal, 0 when omitted (omissible)
1 : Truncated

[Format](data part)
<DN>mmmm,n～n

●Parameter

m[Number of data] = Valid range: 1~2681(bytes)
n[Print data] = data

[Coding Example 1] Minimum module width: 03 (dots), minimum module height: 09 (dots)
Security level: 3, data codeword number per 1 line: 03, lines per a symbol: 18

<A>
<V>100<H>200**<2D10>,03,09,3,03,18**
<DN>0010,0123456789
<Q>2
<Z>



[Coding Example 2] Minimum module width: 03(dots), minimum module height: 09(dots)
Security level: 3, data codeword number per 1 line: 03,
Lines per a symbol: 18, code type: truncated

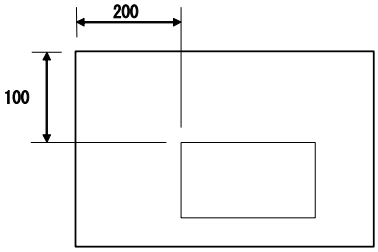
<A>
<V>100<H>200**<2D10>,03,09,3,03,18,1**
<DN>0010,0123456789
<Q>2
<Z>



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[Notes]

1. Specify the base reference point for PDF417 by using vertical position command <V> and horizontal position command <H>.
   <V>100<H>200<2D10>*** ・・・・・・**



2. The ratio of vertical and horizontal size (aspect ratio) is 1:2 according to the number of data when d=e=00.
3. The printing may not be correct when the number of data specified for d and e does not match.
4. Specify bigger d and e when the specified security level is bigger.
5. Recommended to specify more than 2 dots for 8dots/mm and 12dots/mm, and 4 dots for 24dots/mm because the minimum module width and minimum module height may not be read by the scanner.
6. The generation module has been changed for the quality improvement. The generated image may be different, however, the reading result is the same.

[Remarks]

1. The sequential numbering is invalid.
2. Print position specification by auto line feed is not available.
3. Print specification o 00H~FFH is available.
4. Format registration is available.
5. Specify bigger minimum module size when improving the print quality.
6. Specify a bigger security level value when improving the scanner readability.
7. The height of the code varies when the data are only alphabet or only numeric, and when the data are alphanumeric.

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PDF417-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			"	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			'	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[00H to 7FH] are available in PDF417.

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10.2 2D code

MicroPDF417

ESC+2D12

Hexadecimal code	ESC	2D12	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<31>_{16}<32>_{16}$	,aa,bb,c,dd(,e)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify MicroPDF417.

[Format](setting part)
<2D12>,aa,bb,c,dd(,e)

●Parameter

a[Minimum module width]	=	Valid range	:	01~27 (dots)
b[Minimum module height]	=	Valid range	:	01~72 (dots)
c[Data codeword number per 1 line](Cols)	=	Valid range	:	1~4
d[Lines per a symbol](Rows)	=	Valid range	:	2 digits
e[Binary mode specification]	=	0	:	Normal, 0 when omitted (Omissible)
		1	:	Binary mode

[Format](data part)
<DN>mmmm,n～n : When Binary mode specification is "Binary mode"
<DS>n～n : When Binary mode specification is "Normal"

●Parameter

m[Number of data]	=	Valid range	:	0001~0366(bytes)
n[Print data]	=	data		

[Coding Example] Module width: 02(dots), minimum module height: 04(dots)
data codeword number per 1 line: 1, lines per a symbol: 14

<A>
<V>100<H>200**<2D12>,02,04,1,14**
<DN>0010,0123456789
<Q>2
<Z>



[Notes]
1. Lines per a symbol is decided according to the data codeword number per 1 line.
Refer to the "Symbol size and number of data for MicroPDF417" in the next page.
2. Recommend to specify more than 2 dots for 8dots/mm, 12dots/mm, and more than 4 dots for 24dots/mm because the code with the minimum module width and the minimum module height may not be read by a scanner.
3. The generation module has been changed for the quality improvement. The generated image may be different, however, the reading result is the same.

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* The symbol size of MicroPDF417 is fixed to the following 34 types.

"Symbol size and number of data for MicroPDF417"

Symbol size		The maximum number of data		
Cols(c)	Rows(d)	Only alphabet	Only numeric	Binary mode
1	11	6	8	3
	14	12	17	7
	17	18	26	10
	20	22	32	13
	24	30	44	18
	28	38	55	22
2	8	14	20	8
	11	24	35	14
	14	36	52	21
	17	46	67	27
	20	56	82	33
	23	64	93	38
	26	72	105	43
3	6	10	14	6
	8	18	26	10
	10	26	38	15
	12	34	49	20
	15	46	67	27
	20	66	96	39
	26	90	132	54
	32	114	167	68
	38	138	202	82
	44	162	237	97
4	4	14	20	8
	6	22	32	13
	8	34	49	20
	10	46	67	27
	12	58	85	34
	15	76	111	45
	20	106	155	63
	26	142	208	85
	32	178	261	106
	38	214	313	128
	44	250	366	150

* Number of characters vary depending of the combination of alphabet(upper case, lower case), numeric and mix of the control code.

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MicroPDF417-Code Table

					S								O							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			"	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			'	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[00H to FFH] are available in MicroPDF417.

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10.3 2D code

MaxiCode

ESC+2D20

Hexadecimal code	ESC	2D20	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<32>_{16}<30>_{16}$	,a(,bbb,ccc,d～d)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify the MaxiCode.

[Format](setting part)
<2D20>,a(,bbb,ccc,d～d)

●Parameter
a [Mode] = 2 : For carrier (numeric)
3 : For carrier (alphanumeric)
4 : Standard code
6 : For reading device

* Please specify the below parameter when mode 2 or 3 is specified.
Please omit the below parameter when mode 4 or 6 is specified.
b[Service class] = Valid range: 001~999 (numeric)
c[Country code] = Valid range: 001~999 (numeric)
d[Postal code] = Valid range: 0~999999999 (mode 2)
000000~999999(mode 3)
* Maximum 9 digits for mode 2 (only numeric)
Fixed to 6 digits for mode 3 (upper case only for alphabet)

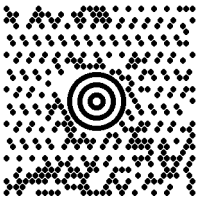
[Format] (data part)
<DN>mmmm,n～n

●Parameter
m[Number of data] = Valid range : 1~138
n[Print data] = data
* 00H can not be specified.

Mode	Service class	Country code	Postal code	The maximum number of print data	
				Numeric only	Alphanumeric
2	Fixed to 3 digits (Numeric only)	Fixed to 3 digits (Numeric only)	Maximum 9 digits	123	84
3			Fixed to 6 digits (alphanumeric)		
4	Omit			138	93
6					

[Coding Example] Mode: For carrier(numeric), Service class: 003, country code : 081
Postal code: 123456789

<A>
<V>100<H>200**<2D20>,2,003,081,123456789**
<DN>0010,0123456789
<Q>2
<Z>



[Notes]
1. The size of the MaxiCode does not vary depending on the number of data.
2. The code will not be printed when a parameter other than above is specified or number of print data does not match.
3. Specify more than 12 for the print data when mode 4 or 6 is specified. The MaxiCode that print data are equal or less than 11 cannot be read by scanners.
4. The maximum number of print data varies depending on the print data combination when other than alphanumeric code are used for the print data.
5. The generation module has been changed for the quality improvement. The generated image may be different, however, the reading result is the same.

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MaxiCode-Code Table

					S					I			S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	__	o	DEL								

[01H to FFH] are available in MaxiCode.

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10.4 2D code

QR Code (Model 2)

ESC+2D30

Hexadecimal code	ESC	2D30	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<33>_{16}<30>_{16}$	,a,bb,c,d(,ee,ff,gg)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify QR code (model 2)

[Format](setting part)
<2D30>,a,bb,c,d(,ee,ff,gg)

●Parameter
a[Error correction level(error correction)] = L : 7%
M : 15%
Q : 25%
H : 30%
b[Size of a side] = Valid range : 01~99(dots)
* Recommend to specify more than 2 dots for 12dots/mm, and 4 dots for 24 dots/mm for scanner readability.
c[Data setting mode] = 0 : Manual setting
1 : Auto setting
* Note that the print data specification varies according to this setting.
d[Combine mode] = 0 : Normal mode
1 : Combine mode
* Please specify the below parameter when combined mode 1 is specified.
Omit the below parameter with the normal mode.
e[Division number of combine mode] = Valid range : 01 ～ 16
* Specify how many divided QR code are to be combined with the combine mode.

f[Sequential number of divided combine mode] = Valid range : 01 ～ 16
* Specify what number of divided QR code.

g[Parity data of combine mode] = Valid range : 00 ～ FF
*Specify the data that is a calculation(exclusive OR) of all divided QR code print data in HEX.

[Format](data part)
Manual setting (Data setting mode)
<DS>k,n～n * This is used when the input mode is numeric mode, alphanumeric mode and Kanji code.
<DN>mmmm,n～n * This is used when specified by binary.
Auto setting (Data setting mode)
<DN>mmmm,n～n * The input mode is automatically switched by the input data.

[Format](version specification)
<QV>pp * This is used when specifying the version.

●Parameter
k[Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode(Shift JIS Kanji code)
* specify this setting only when the manual setting is specified in the data setting mode.
* Note that there is a binary specification other than above, however, the data specification command is different.

m [Number of data] = Valid range: 1~2953
* Specify this setting when auto setting in the data setting mode or binary specification in manual setting is specified.

n[Print data] = data

pp [Version] = 00～40(MODEL2)
* Use this setting when fix the QR symbol size. When this is not specified, it will be auto.
It will be auto when 00 is specified. The parameter error will not occur in the range of 00~40.
* Refer to the "QR code version specification command" for more details.

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[Note 1]

1. When Kanji is specified in the <DN>, specify the size of number of Kanji character x2.
2. When auto setting is on and <DN> specification, 80H~9FH and E0H~FFH is treated as Kanji mode and binary cannot be specified.

[Coding Example 1] Error correction level: 7%, size of a side: 05
data setting mode: manual setting, combine mode: normal

<A>
<V>100<H>200**<2D30>,L,05,0,0**
<DS>1,012345
<Q>2
<Z>



[Note 2]

1. The code will not be printed when a parameter other than above is specified or number of print data does not match.
2. The data specification command in the data part varies according to the setting of the parameter part or specified data contents.

[Note 3]

1. Please specify the data part after the parameter part. Also, specify the data part after the data part continuously. When this fails, printing
   may not be correct.
2. Make the total number of data (n) less than 7000 bytes in this specification. Also the maximum block number of the continuously specified
   data part is 200 blocks.

[Coding Example 2] Error correction level: 7%, size of a side: 05
data setting mode: manual setting, combine mode: normal, printed with version 5

<A>
<V>100<H>200<2D30>,L,05,0,0
<QV>5
<DS>1,012345
<DN>0004,6789
<Q>1
<Z>

[Note 4]

1. Specify the <QV> command in between <2Dxx> and <DN>/<DS>.
2. When the parameter error occurs, it will be treated as no specification.
3. The parameter error will not occur in the range of 00~40. (Please specify the value in the range supported in the model)
   Setting range (MODEL1): 00 to 40
4. The command error occurs and the QR code will not be printed when data exceeded the size limit of the specified version data size.

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QR Code data size table(Model 2)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1 21X21	L	41	25	10	17
	M	34	20	8	14
	Q	27	16	7	11
	H	17	10	4	7
2 25X25	L	77	47	20	32
	M	63	38	16	26
	Q	48	29	12	20
	H	34	20	8	14
3 29X29	L	127	77	32	53
	M	101	61	26	42
	Q	77	47	20	32
	H	58	35	15	24
4 33X33	L	187	114	48	78
	M	149	90	38	62
	Q	111	67	28	46
	H	82	50	21	34
5 37X37	L	255	154	65	106
	M	202	122	52	84
	Q	144	87	37	60
	H	106	64	27	44
6 41X41	L	322	195	82	134
	M	255	154	65	106
	Q	178	108	45	74
	H	139	84	36	58
7 45X45	L	370	224	95	154
	M	293	178	75	122
	Q	207	125	53	86
	H	154	93	39	64
8 49X49	L	461	279	118	192
	M	365	221	93	152
	Q	259	157	66	108
	H	202	122	52	84
9 53X53	L	552	335	141	230
	M	432	262	111	180
	Q	312	189	80	130
	H	235	143	60	98
10 57X57	L	652	395	167	271
	M	513	311	131	213
	Q	364	221	93	151
	H	288	174	74	119

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
11 61X61	L	772	468	198	321
	M	604	366	155	251
	Q	427	259	109	177
	H	331	200	85	137
12 65X65	L	883	535	226	367
	M	691	419	177	287
	Q	489	296	125	203
	H	374	227	96	155
13 69X69	L	1022	619	262	425
	M	796	483	204	331
	Q	580	352	149	241
	H	427	259	109	177
14 73X73	L	1101	667	282	458
	M	871	528	223	362
	Q	621	376	159	258
	H	468	283	120	194
15 77X77	L	1250	758	320	520
	M	991	600	254	412
	Q	703	426	180	292
	H	530	321	136	220
16 81X81	L	1408	854	361	586
	M	1082	656	277	450
	Q	775	470	198	322
	H	602	365	154	250
17 85X85	L	1548	938	397	664
	M	1212	734	310	504
	Q	876	531	224	364
	H	674	408	173	280
18 89X89	L	1725	1046	442	718
	M	1346	816	345	560
	Q	948	574	243	394
	H	746	452	191	310
19 93X93	L	1903	1153	488	792
	M	1500	909	384	624
	Q	1063	644	272	442
	H	813	493	208	338
20 97X97	L	2061	1249	528	858
	M	1600	970	410	666
	Q	1159	702	297	482
	H	919	557	235	382

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Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
	L	2232	1352	572	929
21	M	1708	1035	438	711
101X101	Q	1224	742	314	509
	H	969	587	248	403
	L	2409	1460	618	1003
22	M	1872	1134	480	779
105X105	Q	1358	823	348	565
	H	1056	640	270	439
	L	2620	1158	672	1091
23	M	2059	1248	528	857
109X109	Q	1468	890	376	611
	H	1108	672	284	461
	L	2812	1704	721	1171
24	M	2188	1326	561	911
113X113	Q	1588	963	407	661
	H	1228	744	315	511
	L	3057	1853	784	1273
25	M	2395	1451	614	997
117X117	Q	1718	1041	440	715
	H	1286	779	330	535
	L	3283	1990	842	1367
26	M	2544	1542	652	1059
121X121	Q	1804	1094	462	751
	H	1425	864	365	593
	L	3517	2132	902	1465
27	M	2701	1637	692	1125
125X125	Q	1933	1172	496	805
	H	1501	910	385	625
	L	3669	2223	940	1528
28	M	2857	1732	732	1190
129X129	Q	2085	1263	534	868
	H	1581	958	405	658
	L	3909	2369	1002	1628
29	M	3035	1839	778	1264
133X133	Q	2181	1322	559	908
	H	1677	1016	430	698
	L	4158	2520	1066	1732
30	M	3289	1994	843	1370
137X137	Q	2358	1429	604	982
	H	1782	1080	457	742

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
	L	4417	2677	1132	1840
31	M	3486	2113	894	1452
141X141	Q	2473	1499	634	1030
	H	1897	1150	486	790
	L	4686	2840	1201	1952
32	M	3693	2238	947	1538
145X145	Q	2670	1618	684	1112
	H	2022	1226	518	842
	L	4965	3009	1273	2068
33	M	3909	2369	1002	1628
149X149	Q	2805	1700	719	1168
	H	2157	1307	553	898
	L	5253	3183	1347	2188
34	M	4134	2506	1060	1722
153X153	Q	2949	1787	756	1228
	H	2301	1394	590	958
	L	5529	3351	1417	2303
35	M	4343	2632	1113	1809
157X157	Q	3081	1867	790	1283
	H	2361	1431	605	983
	L	5836	3537	1496	2431
36	M	4588	2780	1176	1911
161X161	Q	3244	1966	832	1351
	H	2524	1530	647	1051
	L	6153	3729	1577	2563
37	M	4775	2894	1224	1989
165X165	Q	3417	2071	876	1423
	H	2625	1591	673	1093
	L	6479	3927	1661	2699
38	M	5039	3054	1292	2099
169X169	Q	3599	2181	923	1499
	H	2735	1658	701	1139
	L	6743	4087	1729	2809
39	M	5313	3220	1362	2213
173X173	Q	3791	2298	972	1579
	H	2927	1774	750	1219
	L	7089	4296	1817	2953
40	M	5596	3391	1435	2331
177X177	Q	3993	2420	1024	1663
	H	3057	1852	784	1273

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10.5 2D code

QR Code (Model 1)

ESC+2D31

Hexadecimal code	ESC	2D31	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<33>_{16}<31>_{16}$	,a,bb,c,d(,ee,ff,gg)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify QR code(model 1)

[Format](setting part)
<2D31>,a,bb,c,d(,ee,ff,gg)

●Parameter
a [Error correction level(error correction)] = L : 7%
M : 15%
Q : 25%
H : 30%
b[Size of a side] = Valid range : 01~99 (dots)
* Recommend to specify more than 2 dots for 12dots/mm, and 4 dots for 24 dots/mm for scanner readability.
c[Data setting mode] = 0 : Manual setting
1 : Auto setting
* Note that the print data specification varies according to this setting.
d[Combine mode] = 0 : Normal mode
1 : Combine mode
* Please specify the below parameter when combined mode 1 is specified.
Omit the below parameter with the normal mode.
e[Division number of combine mode] = Valid range : 01 ～ 16
* Specify how many divided QR code are to be combined with the combine mode.
f[Sequential number of divided combine mode] = Valid range : 01 ～ 16
* Specify what number of divided QR code.
g[Parity data of combine mode] = Valid range : 00 ～ FF
* Specify the data that is a calculation (exclusive OR) of all divided QR code print data in HEX.

[Format](data part)
Manual setting(Data setting mode)
<DS>k,n～n * This is used when the input mode is numeric mode, alphanumeric mode and Kanji code.
<DN>mmmm,n～n * This is used when specified by binary.
Auto setting(Data setting mode)
<DN>mmmm,n～n * The input mode is automatically switched by the input data.

[Format](version specification)
<QV>pp * This is used when specifying the version.

●Parameter
k[Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode(Shift JIS Kanji code)
* specify this setting only when the manual setting is specified in the data setting mode.
* Note that there is binary specification other than above, however, the data specification command is different.

m [Number of data] = Valid range : 1~486
* Specify this setting when auto setting in the data setting mode or binary specification in manual setting is specified.
n [Print data] = data
pp [Version] = 00～40 (MODEL2)
* Use this setting when fix the QR symbol size. When this is not specified, it will be auto.
It will be auto when 00 is specified. The parameter error will not occur in the range of 00~40.
* Refer to the "QR code version specification command" for more details.

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[Note 1]

1. When Kanji is specified in the <DN>, specify the size of number of Kanji character x2.
2. When auto setting is on and <DN> specification, 80H~9FH and E0H~FFH is treated as Kanji mode and binary cannot be specified.

[Coding Example 1] Error correction level: 7%, size of a side: 05
data setting mode: manual setting, combine mode: normal

<A>
<V>100<H>200**<2D31>,L,05,0,0**
<DS>1,012345
<Q>2
<Z>



[Note 2]

1. The code will not be printed when a parameter other than above is specified or number of print data does not match.
2. The data specification command in the data part varies according to the setting of the parameter part or specified data contents.

[Note 3]

Please specify the data part after the parameter part. Also, specify the data part after the data part continuously. When this fails, printing may not be correct.

[Coding Example 2] Error correction level: 7%, size of a side: 05
data setting mode: manual setting, combine mode: normal, printed with version 5

<A>
<V>100<H>200<2D31>,L,05,0,0
<QV>5
<DS>1,012345
<DN>0004,6789
<Q>1
<Z>

[Note 4]

1. Specify the <QV> command in between <2Dxx> and <DN>/<DS>.
2. When the parameter error occurs, it will be treated as no specification.
3. The parameter error will not occur in the range of 00~40. (Please specify the value in the range supported in the model)
   Setting range (MODEL1): 00 to 14
4. The command error occurs and the QR code will not be printed when data exceeded the size limit of the specified version data size.

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QR code data size table (Model1)

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
1 21X21	L	40	24	10	17
	M	33	20	8	14
	Q	25	15	6	11
	H	16	10	4	7
2 25X25	L	81	49	20	34
	M	66	40	17	28
	Q	52	31	13	22
	H	33	20	8	14
3 29X29	L	131	79	33	55
	M	100	60	25	42
	Q	81	49	20	34
	H	52	31	13	22
4 33X33	L	186	113	48	78
	M	138	84	35	58
	Q	114	69	29	48
	H	76	46	19	32
5 37X37	L	253	154	65	106
	M	191	116	49	80
	Q	157	95	40	66
	H	105	63	27	44
6 41X41	L	321	194	82	134
	M	249	151	64	104
	Q	201	122	51	84
	H	133	81	34	56
7 45X45	L	402	244	103	168
	M	311	188	80	130
	Q	253	154	65	106
	H	167	101	43	70
8 49X49	L	493	299	126	206
	M	378	229	97	158
	Q	301	183	77	126
	H	203	123	52	85
9 53X53	L	585	354	150	244
	M	441	267	113	184
	Q	369	223	94	154
	H	239	145	61	100
10 57X57	L	690	418	177	287
	M	526	319	135	219
	Q	433	262	111	180
	H	291	176	74	121

Version	Error Correction	Numeric	Alpha-numeric	Kanji	Binary
11 61X61	L	800	485	205	333
	M	608	368	156	253
	Q	493	299	126	205
	H	342	207	87	142
12 65X65	L	915	555	234	381
	M	694	421	178	289
	Q	579	351	148	241
	H	390	236	100	162
13 69X69	L	1030	624	264	429
	M	790	479	202	329
	Q	656	398	168	273
	H	454	275	116	189
14 73X73	L	1167	707	299	486
	M	877	531	225	365
	Q	738	447	189	307
	H	498	302	127	207

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10.6 2D code

Micro QR Code

ESC+2D32

Hexadecimal code	ESC	2D32	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<33>_{16}<32>_{16}$	,a,bb,c
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify Micro QR code.

[Format](setting part)
<2D32>,a,bb,c

●Parameter
a [Error correction level(error correction)] = L : 7%
M : 15%
Q : 25%
b [Size of a side] = Valid range : 01~99(dots)
* Recommend to specify more than 2 dots for 12dots/mm, and 4 dots for 24 dots/mm for scanner readability.
c [Data setting mode] = 0 : Manual setting
1 : Auto setting

[Format](data part)
Manual setting (Data setting mode)
<DS>k,n～n * This is used when the input mode is numeric mode, alphanumeric mode and Kanji code.
<DN>mmmm,n～n * This is used when specified by binary.
Auto setting (Data setting mode)
<DN>mmmm,n～n * The input mode is automatically switched by the input data.

[Format](version specification)
<QV>pp * This is used when specifying the version.

●Parameter
k[Input mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Kanji mode(Shift JIS Kanji code)
* Note that there is a binary specification other than above, however, the data specification command is different.
m [Number of data] = Valid range : 1~15
* Specify this setting only when the auto setting is specified in the data setting mode.
n[Print data] = data
pp [Version] = 00～40(MODEL2)
* Use this setting when fix the QR symbol size. When this is not specified, it will be auto.
It will be auto when 00 is specified. The parameter error will not occur in the range of 00~40.
* Refer to the "QR code version specification command" for more details.

[Note 1]
1. When Kanji is specified in the <DN>, specify the size of number of Kanji character x2.
2. When auto setting is on and <DN> specification, 80H~9FH and E0H~FFH is treated as Kanji mode and binary cannot be specified.

[Coding Example 1] Error correction level: 7%, size of a side: 04
<A>
<V>100<H>200**<2D32>,L,04,0**
<DS>1,012345
<Q>2
<Z>



[Note 2]
1. The code will not be printed when a parameter other than above is specified or number of print data does not match.
2. The data specification command in the data part varies according to the setting of the parameter part or specified data contents.

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[Note 3]

Please specify the data part after the parameter part. Also, specify the data part after the data part continuously. When this fails, printing
may not be correct.

Micro QR code data size table

Version	Error correction	Numeric	Alphanumeric	Kanji	Binary
M1 (11×11)	L (Error correction only)	5	-	-	-
M2 (13×13)	L M	10 8	6 5	- -	- -
M3 (15×15)	L M	23 18	14 11	6 4	9 7
M4 (17×17)	L M Q	35 30 21	21 18 13	9 8 5	15 13 9

[Coding Example 2] Error correction level: 7%, size of a side: 05
data setting mode: manual setting, combine mode: normal, printed in version M4

<A>
<V>100<H>200<2D32>,L,05,0,0
<QV>4
<DS>1,012345
<DN>0004,6789
<Q>1
<Z>

[Note 4]

1. Specify the <QV> command in between <2Dxx> and <DN>/<DS>.
2. When the parameter error occurs, it will be treated as no specification.
3. The parameter error will not occur in the range of 00~40. (Please specify the value in the range supported in the model)
   Setting range (Micro QR): 00 to 04
4. The command error occurs and the Micro QR code will not be printed when data exceeded the size limit of the specified version data size.

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QR code (Numeric mode)-Code Table

					S			I					S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**				0												
0	0	0	1	**1**				1												
0	0	1	0	**2**				2												
0	0	1	1	**3**				3												
0	1	0	0	**4**				4												
0	1	0	1	**5**				5												
0	1	1	0	**6**				6												
0	1	1	1	**7**				7												
1	0	0	0	**8**				8												
1	0	0	1	**9**				9												
1	0	1	0	**A**																
1	0	1	1	**B**																
1	1	0	0	**C**																
1	1	0	1	**D**																
1	1	1	0	**E**																
1	1	1	1	**F**																

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QR code (Alphanumeric mode)-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0		P										
0	0	0	1	**1**				1	A	Q										
0	0	1	0	**2**				2	B	R										
0	0	1	1	**3**				3	C	S										
0	1	0	0	**4**			$	4	D	T										
0	1	0	1	**5**			%	5	E	U										
0	1	1	0	**6**				6	F	V										
0	1	1	1	**7**				7	G	W										
1	0	0	0	**8**				8	H	X										
1	0	0	1	**9**				9	I	Y										
1	0	1	0	**A**			*	:	J	Z										
1	0	1	1	**B**			+		K											
1	1	0	0	**C**					L											
1	1	0	1	**D**			-		M											
1	1	1	0	**E**			.		N											
1	1	1	1	**F**			/		O											

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QR code (Binary mode)-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			"	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			'	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	¯								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[00H to 7FH],[A0H to DFH] are available in the QR code.

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QR code (Kanji mode)-Code Table

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Symbol	813F		SP	、	。	,	.	・	:	;	?	!	゛	°	´	`	¨
	814F	^	￣	_	ヽ	ヾ	ゝ	ゞ	〃	仝	々	〆	〇	―	—	-	/
	815F	＼	～	∥	｜	…	‥	‘	’	“	”	(	)	〔	〕	[	]
	816F	{	}	〈	〉	《	》	「	」	『	』	【	】	+	−	±	×
	8180	÷	=	≠	<	>	≦	≧	∞	∴	♂	♀	°	′	″	℃	¥
	8190	$	¢	£	%	#	&	*	@	§	☆	★	○	●	◎	◇	
	819E		◆	□	■	△	▲	▽	▼	※	〒	→	←	↑	↓	=	
Alphanumeric	824F	0	1	2	3	4	5	6	7	8	9						
	825F		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	826F	P	Q	R	S	T	U	V	W	X	Y	Z					
	8280		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
	8290	p	q	r	s	t	u	v	w	x	y	z					
Hiragana	829E		ぁ	あ	ぃ	い	ぅ	う	ぇ	え	ぉ	お	か	が	き	ぎ	く
	82AE	ぐ	け	げ	こ	ご	さ	ざ	し	じ	す	ず	せ	ぜ	そ	ぞ	た
	82BE	だ	ち	ぢ	っ	つ	づ	て	で	と	ど	な	に	ぬ	ね	の	は
	82CE	ば	ぱ	ひ	び	ぴ	ふ	ぶ	ぷ	へ	べ	ぺ	ほ	ぼ	ぽ	ま	み
	82DE	む	め	も	ゃ	や	ゅ	ゆ	ょ	よ	ら	り	る	れ	ろ	ゎ	わ
	82EE	ゐ	ゑ	を	ん												
Katakana	833F		ァ	ア	ィ	イ	ゥ	ウ	ェ	エ	ォ	オ	カ	ガ	キ	ギ	ク
	834F	グ	ケ	ゲ	コ	ゴ	サ	ザ	シ	ジ	ス	ズ	セ	ゼ	ソ	ゾ	タ
	835F	ダ	チ	ヂ	ッ	ツ	ヅ	テ	デ	ト	ド	ナ	ニ	ヌ	ネ	ノ	ハ
	836F	バ	パ	ヒ	ビ	ピ	フ	ブ	プ	ヘ	ベ	ペ	ホ	ボ	ポ	マ	ミ
	8380	ム	メ	モ	ャ	ヤ	ュ	ユ	ョ	ヨ	ラ	リ	ル	レ	ロ	ヮ	ワ
	8390	ヰ	ヱ	ヲ	ン	ヴ	ヵ	ヶ									
Greek Alphabet	839E		A	B	Γ	Δ	E	Z	H	Θ	I	K	Λ	M	N	Ξ	O
	83AE	Π	P	Σ	T	Y	Φ	X	Ψ	Ω							
	83BE		α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	ο
	83CE	π	ρ	σ	τ	υ	φ	χ	ψ	ω							
Russian Alphabet	843F		A	Б	B	Г	Д	E	Ё	Ж	З	И	Й	К	Л	M	Н
	844F	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э
	845F	Ю	Я														
	846F		a	б	в	г	д	e	ё	ж	з	и	й	к	л	м	н
	8480	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э
	8490	ю	я														

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ア	889E		亜	唖	娃	阿	哀	愛	挨	姶	逢	葵	茜	穐	悪	握	渥
	88AE	旭	葦	芦	鯵	梓	圧	斡	扱	宛	姐	虻	飴	絢	綾	鮎	或
	88BE	粟	袷	安	庵	按	暗	案	闇	鞍	杏						
イ	88BE											以	伊	位	依	偉	囲
	88CE	夷	委	威	尉	惟	意	慰	易	椅	為	畏	異	移	維	緯	胃
	88DE	萎	衣	謂	違	遺	医	井	亥	域	育	郁	磯	一	壱	溢	逸
	88EE	稲	茨	芋	鰯	允	印	咽	員	因	姻	引	飲	淫	胤	蔭	
	893F		院	陰	隠	韻	吋										
ウ	893F							右	宇	烏	羽	迂	雨	卯	鵜	窺	丑
	894F	碓	臼	渦	嘘	唄	鬱	蔚	鰻	姥	厩	浦	瓜	閏	噂	云	運
	895F	雲															
エ	895F		荏	餌	叡	営	嬰	影	映	曳	栄	永	泳	洩	瑛	盈	穎
	896F	頴	英	衛	詠	鋭	液	疫	益	駅	悦	謁	越	閲	榎	厭	円
	8980	園	堰	奄	宴	延	怨	掩	援	沿	演	炎	焔	煙	燕	猿	縁
	8990	艶	苑	薗	遠	鉛	鴛	塩									
オ	8990								於	汚	甥	凹	央	奥	往	応	
	899E		押	旺	横	欧	殴	王	翁	襖	鴬	鴎	黄	岡	沖	荻	億
	89AE	屋	憶	臆	桶	牡	乙	俺	卸	恩	温	穏	音				
カ	89AE													下	化	仮	何
	89BE	伽	価	佳	加	可	嘉	夏	嫁	家	寡	科	暇	果	架	歌	河
	89CE	火	珂	禍	禾	稼	箇	花	苛	茄	荷	華	菓	蝦	課	嘩	貨
	89DE	迦	過	霞	蚊	俄	峨	我	牙	画	臥	芽	蛾	賀	雅	餓	駕
	89EE	介	会	解	回	塊	壊	廻	快	怪	悔	恢	懐	戒	拐	改	
	8A3F		魁	晦	械	海	灰	界	皆	絵	芥	蟹	開	階	貝	凱	劾
	8A4F	外	咳	害	崖	慨	概	涯	碍	蓋	街	該	鎧	骸	浬	馨	蛙
	8A5F	垣	柿	蛎	鈎	劃	嚇	各	廓	拡	撹	格	核	殻	獲	確	穫
	8A6F	覚	角	赫	較	郭	閣	隔	革	学	岳	楽	額	顎	掛	笠	樫
	8A80	橿	梶	鰍	潟	割	喝	恰	括	活	渇	滑	葛	褐	轄	且	鰹
	8A90	叶	椛	樺	鞄	株	兜	竃	蒲	釜	鎌	噛	鴨	栢	茅	萱	
	8A9E		粥	刈	苅	瓦	乾	侃	冠	寒	刊	勘	勧	巻	喚	堪	姦
	8AAE	完	官	寛	干	幹	患	感	慣	憾	換	敢	柑	桓	棺	款	歓
	8ABE	汗	漢	澗	潅	環	甘	監	看	竿	管	簡	緩	缶	翰	肝	艦
	8ACE	莞	観	諌	貫	還	鑑	間	閑	関	陥	韓	館	舘	丸	含	岸
	8ADE	巌	玩	癌	眼	岩	翫	贋	雁	頑	顔	願					

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
キ	8ADE												企	伎	危	喜	器
	8AEE	基	奇	嬉	寄	岐	希	幾	忌	揮	机	旗	既	期	棋	棄	
	8B3F		機	帰	毅	気	汽	畿	祈	季	稀	紀	徽	規	記	貴	起
	8B4F	軌	輝	飢	騎	鬼	亀	偽	儀	妓	宜	戯	技	擬	欺	犠	疑
	8B5F	祇	義	蟻	誼	議	掬	菊	鞠	吉	吃	喫	桔	橘	詰	砧	杵
	8B6F	黍	却	客	脚	虐	逆	丘	久	仇	休	及	吸	宮	弓	急	救
	8B80	朽	求	汲	泣	灸	球	究	窮	笈	級	糾	給	旧	牛	去	居
	8B90	巨	拒	拠	挙	渠	虚	許	距	鋸	漁	禦	魚	亨	享	京	
	8B9E		供	侠	僑	兇	競	共	凶	協	匡	卿	叫	喬	境	峡	強
	8BAE	彊	怯	恐	恭	挟	教	橋	況	狂	狭	矯	胸	脅	興	蕎	郷
	8BBE	鏡	響	饗	驚	仰	凝	尭	暁	業	局	曲	極	玉	桐	粁	僅
	8BCE	勤	均	巾	錦	斤	欣	欽	琴	禁	禽	筋	緊	芹	菌	衿	襟
	8BDE	謹	近	金	吟	銀											
ク	8BDE						九	倶	句	区	狗	玖	矩	苦	躯	駆	駈
	8BEE	駒	具	愚	虞	喰	空	偶	寓	遇	隅	串	櫛	釧	屑	屈	
	8C3F		掘	窟	沓	靴	轡	窪	熊	隈	粂	栗	繰	桑	鍬	勲	君
	8C4F	薫	訓	群	軍	郡											
ケ	8C4F						卦	袈	祁	係	傾	刑	兄	啓	圭	珪	型
	8C5F	契	形	径	恵	慶	慧	憩	掲	携	敬	景	桂	渓	畦	稽	系
	8C6F	経	継	繋	罫	茎	荊	蛍	計	詣	警	軽	頚	鶏	芸	迎	鯨
	8C80	劇	戟	撃	激	隙	桁	傑	欠	決	潔	穴	結	血	訣	月	件
	8C90	倹	倦	健	兼	券	剣	喧	圏	堅	嫌	建	憲	懸	拳	捲	
	8C9E		検	権	牽	犬	献	研	硯	絹	県	肩	見	謙	賢	軒	遣
	8CAE	鍵	険	顕	験	鹸	元	原	厳	幻	弦	減	源	玄	現	絃	舷
	8CBE	言	諺	限													
コ	8CBE				乎	個	古	呼	固	姑	孤	己	庫	弧	戸	故	枯
	8CCE	湖	狐	糊	袴	股	胡	菰	虎	誇	跨	鈷	雇	顧	鼓	五	互
	8CDE	伍	午	呉	吾	娯	後	御	悟	梧	檎	瑚	碁	語	誤	護	醐
	8DEE	乞	鯉	交	佼	侯	候	倖	光	公	功	効	勾	厚	口	向	
	8D3F		后	喉	坑	垢	好	孔	孝	宏	工	巧	巷	幸	広	庚	康
	8D4F	弘	恒	慌	抗	拘	控	攻	昂	晃	更	杭	校	梗	構	江	洪
	8D5F	浩	港	溝	甲	皇	硬	稿	糠	紅	紘	絞	綱	耕	考	肯	肱
	8D6F	腔	膏	航	荒	行	衡	講	貢	購	郊	酵	鉱	砿	鋼	閤	降
	8D80	項	香	高	鴻	剛	劫	号	合	壕	拷	濠	豪	轟	麹	克	刻

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
コ	8D90	告	国	穀	酷	鵠	黒	獄	漉	腰	甑	忽	惚	骨	狛	込	
	8D9E		此	頃	今	困	坤	墾	婚	恨	懇	昏	昆	根	梱	混	痕
	8DAE	紺	艮	魂													
サ	8DAE				些	佐	叉	唆	嵯	左	差	査	沙	瑳	砂	詐	鎖
	8DBE	裟	坐	座	挫	債	催	再	最	哉	塞	妻	宰	彩	才	採	栽
	8DCE	歳	済	災	采	犀	砕	砦	祭	斎	細	菜	裁	載	際	剤	在
	8DDE	材	罪	財	冴	坂	阪	堺	榊	肴	咲	崎	埼	碕	鷺	作	削
	8DEE	咋	搾	昨	朔	柵	窄	策	索	錯	桜	鮭	笹	匙	冊	刷	
	8E3F		察	拶	撮	擦	札	殺	薩	雑	皐	鯖	捌	錆	鮫	皿	晒
	8E4F	三	傘	参	山	惨	撒	散	桟	燦	珊	産	算	纂	蚕	讃	賛
	8E5F	酸	餐	斬	暫	残											
シ	8E5F						仕	仔	伺	使	刺	司	史	嗣	四	士	始
	8E6F	姉	姿	子	屍	市	師	志	思	指	支	孜	斯	施	旨	枝	止
	8E80	死	氏	獅	祉	私	糸	紙	紫	肢	脂	至	視	詞	詩	試	誌
	8E90	諮	資	賜	雌	飼	歯	事	似	侍	児	字	寺	慈	持	時	
	8E9E		次	滋	治	爾	璽	痔	磁	示	而	耳	自	蒔	辞	汐	鹿
	8EAE	式	識	鴫	竺	軸	宍	雫	七	叱	執	失	嫉	室	悉	湿	漆
	8EBE	疾	質	実	蔀	篠	偲	柴	芝	屡	蕊	縞	舎	写	射	捨	赦
	8ECE	斜	煮	社	紗	者	謝	車	遮	蛇	邪	借	勺	尺	杓	灼	爵
	8EDE	酌	釈	錫	若	寂	弱	惹	主	取	守	手	朱	殊	狩	珠	種
	8EEE	腫	趣	酒	首	儒	受	呪	寿	授	樹	綬	需	囚	収	周	
	8F3F		宗	就	州	修	愁	拾	洲	秀	秋	終	繍	習	臭	舟	蒐
	8F4F	衆	襲	讐	蹴	輯	週	酋	酬	集	醜	什	住	充	十	従	戎
	8F5F	柔	汁	渋	獣	縦	重	銃	叔	夙	宿	淑	祝	縮	粛	塾	熟
	8F6F	出	術	述	俊	峻	春	瞬	竣	舜	駿	准	循	旬	楯	殉	淳
	8F80	準	潤	盾	純	巡	遵	醇	順	処	初	所	暑	曙	渚	庶	緒
	8F90	署	書	薯	藷	諸	助	叙	女	序	徐	恕	鋤	除	傷	償	
	8F9E		勝	匠	升	召	哨	商	唱	嘗	奨	妾	娼	宵	将	小	少
	8FAE	尚	庄	床	廠	彰	承	抄	招	掌	捷	昇	昌	昭	晶	松	梢
	8FBE	樟	樵	沼	消	渉	湘	焼	焦	照	症	省	硝	礁	祥	称	章
	8FCE	笑	粧	紹	肖	菖	蒋	蕉	衝	裳	訟	証	詔	詳	象	賞	醤
	8FDE	鉦	鍾	鐘	障	鞘	上	丈	丞	乗	冗	剰	城	場	壌	嬢	常
	8FEE	情	擾	条	杖	浄	状	畳	穣	蒸	譲	醸	錠	嘱	埴	飾	
	903F		拭	植	殖	燭	織	職	色	触	食	蝕	辱	尻	伸	信	侵

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
シ	904F	唇	娠	寝	審	心	慎	振	新	晋	森	榛	浸	深	申	疹	真
	905F	神	秦	紳	臣	芯	薪	親	診	身	辛	進	針	震	人	仁	刃
	906F	塵	壬	尋	甚	尽	腎	訊	迅	陣	靭						
ス	906F											笥	諏	須	酢	図	厨
	9080	逗	吹	垂	帥	推	水	炊	睡	粋	翠	衰	遂	酔	錐	錘	随
	9090	瑞	髄	崇	嵩	数	枢	趨	雛	据	杉	椙	菅	頗	雀	裾	
	909E		澄	摺	寸												
セ	909E					世	瀬	畝	是	凄	制	勢	姓	征	性	成	政
	90AE	整	星	晴	棲	栖	正	清	牲	生	盛	精	聖	声	製	西	誠
	90BE	誓	請	逝	醒	青	静	斉	税	脆	隻	席	惜	戚	斥	昔	析
	90CE	石	積	籍	績	脊	責	赤	跡	蹟	碩	切	拙	接	摂	折	設
	90DE	窃	節	説	雪	絶	舌	蝉	仄	先	千	占	宣	専	尖	川	戦
	90EE	扇	撰	栓	栴	泉	浅	洗	染	潜	煎	煽	旋	穿	箭	線	
	913F		繊	羨	腺	舛	船	薦	詮	賤	践	選	遷	銭	銑	閃	鮮
	914F	前	善	漸	然	全	禅	繕	膳	糎							
ソ	914F										噌	塑	岨	措	曾	曽	楚
	915F	狙	疏	疎	礎	祖	租	粗	素	組	蘇	訴	阻	遡	鼠	僧	創
	916F	双	叢	倉	喪	壮	奏	爽	宋	層	匝	惣	想	捜	掃	挿	掻
	9180	操	早	曹	巣	槍	槽	漕	燥	争	痩	相	窓	糟	総	綜	聡
	9190	草	荘	葬	蒼	藻	装	走	送	遭	鎗	霜	騒	像	増	憎	
	919E		臓	蔵	贈	造	促	側	則	即	息	捉	束	測	足	速	俗
	91AE	属	賊	族	続	卒	袖	其	揃	存	孫	尊	損	村	遜		
タ	91AE															他	多
	91BE	太	汰	詑	唾	堕	妥	惰	打	柁	舵	楕	陀	駄	騨	体	堆
	91CE	対	耐	岱	帯	待	怠	態	戴	替	泰	滞	胎	腿	苔	袋	貸
	91DE	退	逮	隊	黛	鯛	代	台	大	第	醍	題	鷹	滝	瀧	卓	啄
	91EE	宅	托	択	拓	沢	濯	琢	託	鐸	濁	諾	茸	凧	蛸	只	
	923F		叩	但	達	辰	奪	脱	巽	竪	辿	棚	谷	狸	鱈	樽	誰
	924F	丹	単	嘆	坦	担	探	旦	歎	淡	湛	炭	短	端	箪	綻	耽
	925F	胆	蛋	誕	鍛	団	壇	弾	断	暖	檀	段	男	談			
チ	925F														値	知	地
	926F	弛	恥	智	池	痴	稚	置	致	蜘	遅	馳	築	畜	竹	筑	蓄
	9280	逐	秩	窒	茶	嫡	着	中	仲	宙	忠	抽	昼	柱	注	虫	衷
	9290	註	酎	鋳	駐	樗	瀦	猪	苧	著	貯	丁	兆	凋	喋	寵	

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チ	929E		帖	帳	庁	弔	張	彫	徴	懲	挑	暢	朝	潮	牒	町	眺
	92AE	聴	脹	腸	蝶	調	諜	超	跳	銚	長	頂	鳥	勅	捗	直	朕
	92BE	沈	珍	賃	鎮	陳											
ツ	92BE						津	墜	椎	槌	追	鎚	痛	通	塚	栂	掴
	92CE	槻	佃	漬	柘	辻	蔦	綴	鍔	椿	潰	坪	壺	嬬	紬	爪	吊
	92DE	釣	鶴														
テ	92DE			亭	低	停	偵	剃	貞	呈	堤	定	帝	底	庭	廷	弟
	92EE	悌	抵	挺	提	梯	汀	碇	禎	程	締	艇	訂	諦	蹄	逓	
	933F		邸	鄭	釘	鼎	泥	摘	擢	敵	滴	的	笛	適	鏑	溺	哲
	934F	徹	撤	轍	迭	鉄	典	填	天	展	店	添	纏	甜	貼	転	顛
	935F	点	伝	殿	澱	田	電										
ト	935F							兎	吐	堵	塗	妬	屠	徒	斗	杜	渡
	936F	登	菟	賭	途	都	鍍	砥	砺	努	度	土	奴	怒	倒	党	冬
	9380	凍	刀	唐	塔	塘	套	宕	島	嶋	悼	投	搭	東	桃	梼	棟
	9390	盗	淘	湯	涛	灯	燈	当	痘	祷	等	答	筒	糖	統	到	
	939E		董	蕩	藤	討	謄	豆	踏	逃	透	鐙	陶	頭	騰	闘	働
	93AE	動	同	堂	導	憧	撞	洞	瞳	童	胴	萄	道	銅	峠	鴇	匿
	93BE	得	徳	涜	特	督	禿	篤	毒	独	読	栃	橡	凸	突	椴	届
	93CE	鳶	苫	寅	酉	瀞	噸	屯	惇	敦	沌	豚	遁	頓	呑	曇	鈍
ナ	93DE	奈	那	内	乍	凪	薙	謎	灘	捺	鍋	楢	馴	縄	畷	南	楠
	93EE	軟	難	汝													
ニ	93EE				二	尼	弐	迩	匂	賑	肉	虹	廿	日	乳	入	
	943F		如	尿	韮	任	妊	忍	認								
ヌ	943F									濡							
ネ	943F										禰	祢	寧	葱	猫	熱	年
	944F	念	捻	撚	燃	粘											
ノ	944F						乃	廼	之	埜	嚢	悩	濃	納	能	脳	膿
	945F	農	覗	蚤													
ハ	945F				巴	把	播	覇	杷	波	派	琶	破	婆	罵	芭	馬
	946F	俳	廃	拝	排	敗	杯	盃	牌	背	肺	輩	配	倍	培	媒	梅
	9480	楳	煤	狽	買	売	賠	陪	這	蝿	秤	矧	萩	伯	剥	博	拍
	9490	柏	泊	白	箔	粕	舶	薄	迫	曝	漠	爆	縛	莫	駁	麦	
	949E		函	箱	硲	箸	肇	筈	櫨	幡	肌	畑	畠	八	鉢	溌	発
	94AE	醗	髪	伐	罰	抜	筏	閥	鳩	噺	塙	蛤	隼	伴	判	半	反

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ハ	94BE	叛	帆	搬	斑	板	氾	汎	版	犯	班	畔	繁	般	藩	販	範
	94CE	釆	煩	頒	飯	挽	晩	番	盤	磐	蕃	蛮					
ヒ	94CE												匪	卑	否	妃	庇
	94DE	彼	悲	扉	批	披	斐	比	泌	疲	皮	碑	秘	緋	罷	肥	被
	94EE	誹	費	避	非	飛	樋	簸	備	尾	微	枇	毘	琵	眉	美	
	953F		鼻	柊	稗	匹	疋	髭	彦	膝	菱	肘	弼	必	畢	筆	逼
	954F	桧	姫	媛	紐	百	謬	俵	彪	標	氷	漂	瓢	票	表	評	豹
	955F	廟	描	病	秒	苗	錨	鋲	蒜	蛭	鰭	品	彬	斌	浜	瀕	貧
	956F	賓	頻	敏	瓶												
フ	956F					不	付	埠	夫	婦	富	冨	布	府	怖	扶	敷
	9580	斧	普	浮	父	符	腐	膚	芙	譜	負	賦	赴	阜	附	侮	撫
	9590	武	舞	葡	蕪	部	封	楓	風	葺	蕗	伏	副	復	幅	服	
	959E		福	腹	複	覆	淵	弗	払	沸	仏	物	鮒	分	吻	噴	墳
	95AE	憤	扮	焚	奮	粉	糞	紛	雰	文	聞						
ヘ	95AE											丙	併	兵	塀	幣	平
	95BE	弊	柄	並	蔽	閉	陛	米	頁	僻	壁	癖	碧	別	瞥	蔑	箆
	95CE	偏	変	片	篇	編	辺	返	遍	便	勉	娩	弁	鞭			
ホ	95CE														保	舗	鋪
	95DE	圃	捕	歩	甫	補	輔	穂	募	墓	慕	戊	暮	母	簿	菩	倣
	95EE	俸	包	呆	報	奉	宝	峰	峯	崩	庖	抱	捧	放	方	朋	
	963F		法	泡	烹	砲	縫	胞	芳	萌	蓬	蜂	褒	訪	豊	邦	鋒
	964F	飽	鳳	鵬	乏	亡	傍	剖	坊	妨	帽	忘	忙	房	暴	望	某
	965F	棒	冒	紡	肪	膨	謀	貌	貿	鉾	防	吠	頬	北	僕	卜	墨
	966F	撲	朴	牧	睦	穆	釦	勃	没	殆	堀	幌	奔	本	翻	凡	盆
マ	9680	摩	磨	魔	麻	埋	妹	昧	枚	毎	哩	槙	幕	膜	枕	鮪	柾
	9690	鱒	桝	亦	俣	又	抹	末	沫	迄	侭	繭	麿	万	慢	満	
	969E		漫	蔓													
ミ	969E				味	未	魅	巳	箕	岬	密	蜜	湊	蓑	稔	脈	妙
	96AE	粍	民	眠													
ム	96AE				務	夢	無	牟	矛	霧	鵡	椋	婿	娘			
メ	96AE														冥	名	命
	96BE	明	盟	迷	銘	鳴	姪	牝	滅	免	棉	綿	緬	面	麺		
モ	96BE															摸	模
	96CE	茂	妄	孟	毛	猛	盲	網	耗	蒙	儲	木	黙	目	杢	勿	餅

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
モ	96DE	尤	戻	籾	貰	問	悶	紋	門	匁							
ヤ	96DE										也	冶	夜	爺	耶	野	弥
	96EE	矢	厄	役	約	薬	訳	躍	靖	柳	薮	鑓					
ユ	96EE												愉	愈	油	癒	
	973F		諭	輸	唯	佑	優	勇	友	宥	幽	悠	憂	揖	有	柚	湧
	974F	涌	猶	猷	由	祐	裕	誘	遊	邑	郵	雄	融	夕			
ヨ	974F														予	余	与
	975F	誉	輿	預	傭	幼	妖	容	庸	揚	揺	擁	曜	楊	様	洋	溶
	976F	熔	用	窯	羊	耀	葉	蓉	要	謡	踊	遥	陽	養	慾	抑	欲
	9780	沃	浴	翌	翼	淀											
ラ	9780						羅	螺	裸	来	莱	頼	雷	洛	絡	落	酪
	9790	乱	卵	嵐	欄	濫	藍	蘭	覧								
リ	9790									利	吏	履	李	梨	理	璃	
	979E		痢	裏	裡	里	離	陸	律	率	立	葎	掠	略	劉	流	溜
	97AE	琉	留	硫	粒	隆	竜	龍	侶	慮	旅	虜	了	亮	僚	両	凌
	97BE	寮	料	梁	涼	猟	療	瞭	稜	糧	良	諒	遼	量	陵	領	力
	97CE	緑	倫	厘	林	淋	燐	琳	臨	輪	隣	鱗	麟				
ル	97CE													瑠	塁	涙	累
	97DE	類															
レ	97DE		令	伶	例	冷	励	嶺	怜	玲	礼	苓	鈴	隷	零	霊	麗
	97EE	齢	暦	歴	列	劣	烈	裂	廉	恋	憐	漣	煉	簾	練	聯	
	983F		蓮	連	錬												
ロ	983F					呂	魯	櫓	炉	賂	路	露	労	婁	廊	弄	朗
	984F	楼	榔	浪	漏	牢	狼	篭	老	聾	蝋	郎	六	麓	禄	肋	録
	985F	論															
ワ	985F		倭	和	話	歪	賄	脇	惑	枠	鷲	亙	亘	鰐	詫	藁	蕨
	986F	椀	湾	碗	腕												

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
一	989E			弋	丐	丕											
丨	989E					个	丱										
丶	989E							丶	丼								
丿	989E									丿	乂	乖	乘				
乙	989E													亂			
亅	989E														亅	豫	事
	98AE	舒															
二	98AE			弍	于	亞		亟									
亠	98AE							亠	亢	亰	亳	亶					
人	98AE											从	仍	仄	仆	仂	仗
	98BE	仞	仭	仟	价	伉	佚	估	佛	佝	佗	佇	佶	侈	侏	侘	佻
	98CE	佩	佰	侑	佯	來	侖	儘	俔	俟	俎	俘	俛	俑	俚	俐	俤
	98DE	俥	倚	倨	倔	倪	倥	倅	伜	俶	倡	倩	倬	俾	俯	們	倆
	98EE	偃	假	會	偕	偬	偈	做	偖	傯	傴	傀	傚	傅	傴	傲	
	993F		僉	僊	傳	僂	僖	僞	僥	僭	僣	僮	價	僵	儉	儁	儂
	994F	儖	儕	儔	儚	儡	儺	儷	儼	儻							
儿	994F										儿	兀	兒	兌	兔	兢	競
入	995F	兩	兪														
八	995F				兮	冀											
冂	995F					冂	冏	冊	冉	冏	冑	冓	冕				
冖	995F													冖	冤	冠	冢
	996F	冩	冪														
冫	996F				冫	决	冱	冲	冰	况	冽	凅	凉	凛			
几	996F													几	處	凩	凭
	9980	凰															
凵	9980			凵	函												
刀	9980				刃	刋	刈	刎	刧	刪	刮	刳	刹	刱	刲	刻	刺
	9990	刮	剔	剪	剴	剩	剳	剿	剽	劍	劒	劔	劔	劈	劑	辨	
	999E		辦														
力	999E				劬	劭	劼	劵	勁	勍	勗	勞	勣	勦	飭	勠	勳	勵
	99AE	勸															
勹	99AE			勹	匆	匈	匐	匍	匐	匏							
匕	99AE									匕							
匚	99AE										匚	匣	匯	匱	匳		

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
亡	99AE															亡	區
十	99BE	卆	卅	丗	卉	卍	準										
卜	99BE							卞									
卩	99BE								卩	卮	卯	卻	卷				
厂	99BE													厂	厄	厠	厦
	99CE	厥	厮	厰													
厶	99CE				厶	參	篡										
又	99CE							雙	叟	曼	燮						
口	99CE											叮	叨	叭	叺	吁	吽
	99DE	呀	听	吭	吼	吮	吶	吩	吝	呎	咏	呵	咎	呟	呱	呷	呰
	99EE	咒	呻	咀	呪	咄	咐	咆	哇	咢	咸	咥	咬	哄	哈	咨	
	9A3F		咫	哂	咤	哱	哽	哘	哥	哦	唏	唔	哽	唗	哭	哺	唞
	9A4F	唘	唯	唧	唾	售	啜	啅	啖	啗	唸	唳	唲	喙	喀	咯	喊
	9A5F	喟	啻	啾	喘	喞	單	啼	喃	喻	喇	喨	嗚	嗅	嗟	嗄	嗜
	9A6F	嗤	嗔	嘔	嗷	嘖	嗾	嗽	嘛	嗹	噎	噐	營	嘴	嘶	嘲	嘸
	9A8O	噫	噤	噦	噬	噪	噣	噞	噂	噈	噮	噓	噤	嚮	嚶	嚴	囂
	9A9O	嚼	嚾	嚩	囀	囈	囃	囑	囓								
口	9A9O									口	囘	圀	圀	囿	圄	圉	
	9A9E		圈	國	圍	圓	團	圖	嗇	圜							
土	9A9E										圠	圩	圳	圾	圻	址	坏
	9AAE	坩	垂	垈	坡	坿	垉	垓	垠	垳	垰	垺	垕	埃	埆	埔	埒
	9ABE	埒	埜	垅	埣	堋	堙	堝	塲	堡	塢	塋	塗	毀	塒	堲	塹
	9ACE	墅	墹	墟	墫	墺	壞	墻	墸	墮	壅	壓	壑	壗	壙	壘	壝
	9ADE	壛	壤	壟													
士	9ADE				壯	壺	壹	壻	壺	壽							
夂	9ADE										夂						
夊	9ADE											夊	夐				
夕	9ADE													夛	梦	夥	
大	9ADE																夬
	9AEE	夭	本	夸	夾	奇	奕	奐	奎	奚	奘	奢	奠	奥	奬	奩	
女	9B3F		奸	妁	妝	佞	佞	妣	妲	姆	姨	姜	妍	姪	姚	娥	娟
	9B4F	娑	娜	娉	娚	婀	娙	婉	娵	娶	婢	婪	媚	媼	媾	嫋	嫂
	9B5F	媽	嫣	嫗	嫦	嫩	嫖	嫺	嫻	嬌	嬋	嬖	嬲	嬾	嬪	嬶	嬾
	9B6F	孃	孅	孀													

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
子	9B6F				孑	孕	孚	孛	孥	孩	孰	孳	孵	學	孝	孺	
宀	9B6F																宀
	9B80	它	宦	宸	寃	寇	寉	寔	寐	寤	實	寢	寞	寥	寫	寰	寶
	9B90	寳															
寸	9B90		尅	將	專	對											
小	9B90						尒	尠									
尤	9B90								尢	尷							
尸	9B90										尸	尹	屁	屆	屎	屓	
	9B9E		屐	屏	孱	屬											
屮	9B9E						屮										
山	9B9E							屺	岁	屹	岌	岑	岔	妛	岫	岻	岼
	9BAE	岾	岨	岷	岵	峇	峙	峩	峽	峺	峭	嵎	峪	崋	崕	崗	崙
	9BBE	崟	崛	崑	崔	崢	崚	崙	崘	嵌	嵒	嵎	嵋	嵬	嵳	嵷	嶇
	9BCE	嶄	嶂	嶢	嶝	嶬	嶮	嶽	嶾	嶷	嶼	嶲	巍	巔	巒	巖	
巛	9BCE																巛
工	9BDE	巫															
已	9BDE		已	巵													
巾	9BDE				帋	帚	帙	帑	帛	帶	帷	幄	幃	幀	幎	幗	幔
	9BEE	幟	幢	幣	幇												
干	9BEE					幵	并										
幺	9BEE							幺	麼								
广	9BEE									广	庠	廁	廂	廈	廏	廖	
	9C3F		廖	廣	廝	廚	廬	廢	廡	廨	廩	廬	廱	廳	廱		
廴	9C3F															廴	廸
廾	9C4F	廾	弃	弉	彝	彜											
弋	9C4F						弋	弒									
弓	9C4F								弓	弩	弭	弸	弼	彈	彌	彎	弯
彑	9C5F	彑	彖	彗	彙												
彡	9C5F					彡	彭										
彳	9C5F							彳	彷	徃	徂	彿	徊	很	徑	徇	從
	9C6F	徙	徘	徠	徨	徭	徼										
心	9C6F							忖	忻	忤	忸	忱	忝	悳	忿	怡	恠
	9C80	怙	怮	怩	怎	怱	怛	怕	怫	怦	怏	怺	恚	恁	恪	恣	恮
	9C90	恊	恆	恍	恣	恃	恤	恂	恬	恫	恙	悁	悍	惧	悃	悚	

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
心	9C9E		悄	悛	悖	悗	悃	悒	悋	悪	悸	悳	悵	悴	悻	悽	惆
	9CAE	悵	惘	慍	愕	愆	惶	惴	愀	惴	惺	愃	愡	惻	惱	愍	愎
	9CBE	慇	愾	慤	愧	慊	愿	愼	慝	慥	慱	慟	慄	憖	慘	慙	慚
	9CCE	慚	慫	慴	慯	慥	慱	慟	慝	慓	慵	慷	慼	憇	憬	憔	憚
	9CDE	憊	憑	憫	憮	懌	懊	應	懷	懈	懃	懆	憺	懋	罹	懍	懦
	9CEE	懣	懶	懺	懴	懿	懽	懼	懾	戀							
戈	9CEE										戈	戉	戍	戌	戔	戛	
	9D3F		戞	戡	截	戮	戰	戲	戳								
戸	9D3F									扁							
手	9D3F										扎	扞	扣	扛	扠	扨	扼
	9D4F	抂	抉	找	抒	抓	抖	拔	抃	抔	拗	拑	抻	拏	拿	拆	擔
	9D5F	拈	拜	拌	拊	拂	拇	抛	拉	挌	拮	拱	挧	挂	挈	拯	拵
	9D6F	捐	挾	捍	搜	捏	掖	掎	掀	掫	捶	掣	掏	掉	掟	掄	捫
	9D80	捩	掾	揩	揀	揆	揣	揉	插	揶	揄	搖	搴	搆	搓	搦	搶
	9D90	攝	搗	搦	搏	搧	撃	搏	撄	攪	撕	撓	撥	撩	撈	撼	
	9D9E		據	擒	擅	擇	撻	擘	擂	攔	擧	舉	擠	擡	抬	擣	擯
	9DAE	攬	擶	擴	擲	擺	攀	攙	攘	攜	攅	攤	攣	攫			
攴	9DAE														攴	攵	攷
	9DBE	收	攸	畋	效	敖	敕	敍	敘	敞	敝	敲	數	斂	斃	變	
斗	9DBE																斛
	9DCE	斟															
斤	9DCE		斫	斷													
方	9DCE				旆	旄	旁	旄	旌	旒	旛	旙					
无	9DCE												无	旡			
日	9DCE														旱	杲	旻
	9DDE	昃	昊	杳	昵	昶	昴	昜	晏	晄	晉	晁	晞	晝	晤	晧	晨
	9DEE	晟	晢	晰	暈	暌	暉	暄	暘	暝	暨	暹	曉	暸	暫		
	9E3F		曄	暸	曖	曚	曠	昿	曦	曩							
曰	9E3F										曰	曳	曷				
月	9E3F													朏	朖	朞	朦
	9E4F	朧	霸														
木	9E4F			朮	朿	朶	杁	朸	朷	杆	杞	杠	杙	杣	杤	杜	杰
	9E5F	杼	杼	杪	杤	枋	枦	枡	枡	枷	柯	柈	柬	枳	柩	枸	柤
	9E6F	柞	柝	柢	柮	枹	柮	柆	柧	檜	栞	框	栩	桀	桍	栲	桎

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
木	9E80	梳	栫	椪	档	桷	桿	梟	梏	梭	梔	條	梛	梃	檮	栃	桴
	9E90	梵	梧	梹	桎	桅	桾	椁	棊	椥	棘	椢	梫	棡	椌	椌	棍	
	9E9E		棔	棧	棕	椶	椒	椄	棗	棣	椥	棹	棠	棯	椯	椌	椚
	9EAE	椀	梳	棆	楹	楷	椥	楸	楫	楔	楾	楮	椹	楴	椽	楙	椰
	9EBE	榆	楞	棟	椓	楪	榲	榮	槐	榿	槁	槓	棔	槎	寨	槊	楊
	9ECE	楊	槃	棰	槀	槫	榠	榜	榕	榴	槞	槨	樂	樛	槿	權	槔
	9EDE	槲	槧	樅	榱	樞	槭	樔	槫	樊	樒	櫁	槾	樓	橄	樌	橲
	9EEE	橦	橚	橇	橢	橙	橦	橈	樸	檎	檐	橞	檠	檄	檢	檣	
	9F3F		檗	蘗	檻	櫃	櫂	檸	檳	檬	櫺	櫑	櫟	櫟	櫚	櫪	櫻
	9F4F	欅	蘖	櫺	欒	欖	鬱	欟									
欠	9F4F								欸	欷	盜	欹	飮	歇	歃	歉	歐
	9F5F	歙	歔	歛	歟	歡											
止	9F5F						歸										
歹	9F5F							歹	歿	殀	殄	殃	殍	殘	殕	殞	殤
	9F6F	殪	殫	殯	殲	殲											
殳	9F6F						殳	殷	殼	毆							
毋	9F6F										毋	毓					
毛	9F6F												毟	毬	毫	毳	毯
	9F80	麾	氈														
氏	9F80			氓													
气	9F80				气	氛	氤	氣									
水	9F80								汞	汕	汢	汪	沂	沍	沚	沁	沛
	9F90	汾	汨	汳	沒	沐	泄	泱	泓	沽	泗	泅	泝	沮	沱	沾	
	9F9E		泗	泛	泯	泙	泪	洟	衍	洶	洫	洽	洸	洙	洵	洳	洒
	9FAE	洌	浣	涓	浤	浚	浹	浙	涎	涕	濤	涅	淹	渕	渊	涵	淇
	9FBE	淦	涸	淆	淬	淞	淌	淨	淒	淅	淺	淙	淤	淦	淪	淮	渭
	9FCE	湮	湍	渙	湲	湟	渾	渣	湫	湛	渌	湍	渟	湃	渺	湎	渤
	9FDE	滿	滷	游	滌	溪	溘	滉	溷	滓	溽	溯	滄	溲	滔	滕	溏
	9FEE	溥	滂	溟	潁	漑	灌	滬	滸	滾	漿	滲	漱	滯	漲	滌	
	E03F		漾	漓	滷	澆	潺	潸	澁	澀	潯	潛	濳	潭	澩	潼	潘
	E04F	澎	澑	濂	潦	澳	濬	澡	澤	澹	濆	澪	濟	濕	濬	濔	濘
	E05F	濱	濮	濛	瀉	瀋	濺	瀑	瀁	瀏	濾	瀛	瀚	瀦	瀝	瀘	瀟
	E06F	瀰	瀾	瀲	灑	灣											
火	E06F						炙	炒	炯	烟	炬	炸	炳	炮	烟	烋	烝

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
火	E080	烙	焉	烽	焜	焙	煥	煕	熙	煦	煢	煌	煖	煬	熏	燻	熄
	E090	燠	燹	爇	爛	燹	燻	燒	燉	燔	燎	燠	燬	燧	燵	燼	
	E09E		燹	燿	爍	爐	爛	爨									
爪	E09E								爭	爬	爰	爲					
爻	E09E												爻	爼			
爿	E09E														爿	牀	牆
	E0AE	牋	牘														
牛	E0AE				牴	牾	犂	犁	犇	犒	犖	犢	犠				
犬	E0AE												犹	狄	狃	狆	狄
	E0BE	狎	狒	狢	狠	狡	狹	狷	倏	猗	猊	猜	猖	猝	猴	猯	猩
	E0CE	猥	猾	獎	獏	默	獗	獪	獨	獰	獣	獵	獻	獺			
王	E0CE														珈	珙	珎
	E0DE	玻	珀	珥	珮	珞	珊	琅	琊	琥	琶	琲	琺	瑕	琿	瑟	瑙
	E0EE	瑁	瑜	瑩	瑰	瑣	瑪	瑶	瑾	璋	璞	璧	瓊	瓏	瓔	珱	
瓜	E13F		瓠	瓣													
瓦	E13F				瓩	瓧	瓮	瓲	瓰	甌	甎	瓷	甄	甖	甕	甌	甎
	E14F	甍	甕	甓													
甘	E14F				甞												
生	E14F					甦											
用	E14F						甬										
田	E14F							畚	畄	畋	畊	畉	畛	畝	畚	畎	畤
	E15F	畧	畫	畛	畸	當	疆	疇	畴	疊	疊	疊					
疒	E15F												疔	疚	疝	疥	疣
	E16F	痂	疳	痃	疵	疽	疸	疼	疱	痍	痊	痒	痙	痣	痞	痾	痿
	E180	痼	痺	痰	痺	痲	痳	瘋	瘍	瘉	瘟	瘧	瘠	瘡	瘢	瘤	瘴
	E190	瘰	瘻	癇	癈	癆	癌	癘	癡	癢	癨	癩	癪	癰	癬	癲	
	E19E		癪														
癶	E19E			癶	癸	發											
白	E19E						皂	皃	皈	皋	皎	皖	皓	皙	皚		
皮	E19E															皰	皺
	E1AE	皸	皹	皺													
皿	E1AE				盂	盍	盖	盒	盞	盡	盥	盧	盪	蘯			
目	E1AE														盼	眈	眇
	E1BE	眄	眩	眤	眞	眥	眦	眛	眷	眸	睇	睚	睨	睫	睛	睥	睿

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
目	E1CE	睾	睹	瞎	瞋	瞑	瞠	瞞	瞰	瞶	瞹	瞿	瞼	矇	矚	矯	矍
	E1DE	矗	矚														
矛	E1DE			矜													
矢	E1DE				矣	矮											
石	E1DE						砿	砌	砒	礦	砠	礪	硅	碎	硼	碵	硼
	E1EE	碚	碌	碣	碵	碪	碭	碵	碻	碭	碟	碾	碼	磅	磊	磬	
	E23F		磧	磚	磽	磴	磲	礒	礎	礙	礬	礫					
示	E23F												祀	祠	祇	祟	祚
	E24F	祕	祓	祺	祿	禊	禍	禧	齋	禪	禮	禳					
禺	E24F												禹	禺			
禾	E24F															秉	秕	秧
	E25F	秬	秡	秣	稈	稍	稘	稙	稠	稟	禀	稱	稻	稾	稷	稼	穂
	E26F	穉	穡	穢	穩	龝	穣										
穴	E26F							窮	窪	窈	窗	窕	窘	窖	窩	竈	窯
	E280	窶	窺	竄	窿	邃	竇	竊									
立	E280								竚	竡	竚	竰	站	竧	竝	竡	竢
	E290	竦	竭	竰													
竹	E290				笂	笏	笊	笆	笳	笘	笙	笞	笵	笨	笶	筐	
	E29E		筺	笄	筍	箏	筌	筅	筵	筥	筴	筧	箐	箙	箘	箟	箍
	E2AE	箘	箙	箍	箜	箚	箋	箒	箏	箏	箙	箘	箘	篌	篏	箴	篆
	E2BE	篝	篩	簔	簔	篦	篥	籠	簀	簇	簀	篳	篷	簗	簍	篶	篋
	E2CE	簧	簪	簟	簷	簫	簽	籌	籃	籔	簇	籀	籐	籐	籟	籤	籖
	E2DE	籥	籬														
米	E2DE			粁	粗	粐	粤	粭	粢	粨	粡	粕	粳	粲	粱	粮	粹
	E2EE	粽	糀	糅	糘	糘	糒	糜	糢	鬻	糯	糲	糴	糶			
糸	E2EE														糺	紆	
	E33F		紂	紜	紕	紊	絅	紘	紮	絏	絆	紵	絆	絳	絖	絎	絲
	E34F	絨	絮	絏	絣	經	綉	絛	綏	絽	綛	綺	綮	綣	綵	緇	綽
	E35F	綫	總	綢	綯	緜	綸	綟	綰	緘	緝	緤	緞	緻	緲	緙	緘
	E36F	縊	縣	縡	縒	縋	縟	縉	縋	縢	繆	繩	縻	縵	縹	繃	縷
	E380	繆	繩	繧	繝	繖	繞	繙	繚	繹	繪	繩	繼	繻	繻	繙	繽
	E390	辮	繿	纈	纉	續	纏	纈	纓	纔	纖	纎	纛	纜			
缶	E390														缸	缺	
	E39E		罅	罌	罍	罐	罐										

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
网	E39E							网	罕	罔	罘	罟	罠	罼	罩	罸	罰
	E3AE	羂	羆	羃	羈	羇											
羊	E3AE						羌	羔	羞	羝	羚	羣	羯	羲	羹	羹	羶
	E3BE	羸	譱														
羽	E3BE			翅	翠	翊	翕	翔	翡	翦	翩	翳	翹	飜			
老	E3BE														耆	耄	耋
耒	E3CE	耒	耘	耙	耜	耡	耨										
耳	E3CE							耻	耻	聊	聆	聒	聘	聚	聟	聢	聯
	E3DE	聳	聲	聰	聶	聹	聽										
聿	E3DE							聿	肄	肆	肅						
肉	E3DE											肛	肓	肚	肭	冐	肬
	E3EE	胛	胥	胙	胝	胄	胚	胖	脉	胯	胱	脛	脩	脣	脯	脹	
	E43F		隋	腆	脾	腓	腑	胼	腱	腮	腥	腦	腴	膃	膈	膊	膀
	E44F	膂	膠	膕	膤	膣	膟	腸	膩	膰	膵	膾	膸	膽	臀	臂	膺
	E45F	臉	臍	臑	臙	臘	臈	臚	臟	臠							
臣	E45F										臧						
至	E45F											臺	臻				
臼	E45F													與	舁	舂	舅
	E46F	與	舊														
舌	E46F			舎	舐	舗											
舟	E46F						舩	舫	舸	舳	艀	艙	艘	艝	艚	艟	艤
	E480	艨	艩	艪	艫	艮											
艮	E480						艱										
色	E480							艶									
艸	E480								艸	艾	芍	芒	芫	芟	芻	芬	苡
	E490	苣	苟	苒	苴	苳	苺	莓	范	苻	苹	苞	茆	苔	茉	苣	
	E49E		茵	茴	茖	茲	茱	萄	茹	荐	荅	茯	茫	茗	荔	莅	莚
	E4AE	莪	莟	莢	莖	莫	莎	莇	莊	荼	莵	荳	荵	莠	莉	莨	菴
	E4BE	萓	菫	菎	萩	萃	萩	萋	菁	萹	萇	菠	菲	萍	菟	萠	莽
	E4CE	萸	蔆	葒	葭	葎	葤	葬	葸	葷	葫	蒡	葭	蒂	葩	葆	萬
	E4DE	葯	葹	萵	蓊	葢	蒹	蒿	蒟	蓙	蓍	蓊	蒨	蓼	蓁	蓆	蓖
	E4EE	蓑	蔡	蓿	蓴	蔗	蔘	蔬	蔟	蔕	蔔	蔘	蔭	蘚	蘞	蕈	
	E53F		蕁	藥	蓰	猶	薀	薙	薈	薑	薹	薊	薨	蕭	薔	薛	藪
	E54F	薜	蘋	蕾	藐	藉	薺	藏	薹	藐	藕	藝	藥	藜	藹	蘊	蘓

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
艸	E55F	蘋	藾	藺	蘆	蘢	蘇	蘰	蘿								
虍	E55F									虎	虏	虔	號	虧			
虫	E55F														虱	蚓	蚣
	E56F	蚩	蚪	蚋	蚌	蚶	蚯	蛄	蛆	蛐	蛉	蠣	蛹	蛔	蛞	蛩	蛬
	E580	蛟	蛛	蛯	蛭	蜆	蜈	蜀	蜃	蜕	蜑	蜉	蜍	蛹	蜊	蜴	蜿
	E590	蜷	蜻	蜥	蜩	蜚	蝠	蝟	蝸	蝌	蝎	蝴	蝗	蝨	蝮	蝙	
	E59E		蝓	蝣	蝪	蠅	螢	螟	螂	螯	螋	螽	蟀	蟐	雖	螫	蟄
	E5AE	螳	蟇	蟆	螻	蟯	蟲	蟠	蠏	蠍	蟾	蟶	蟷	蠑	蠖	蠍	蠖
	E5BE	蠕	蠢	蠡	蠱	蠶	蠹	蠧	蠻								
血	E5BE									衄	衂						
行	E5BE											衒	衙	衞	衢		
衣	E5BE															衫	袁
	E5CE	衾	衰	衵	衽	衿	袋	袂	袗	袒	袮	袙	袢	袍	袤	袈	袿
	E5DE	袱	袴	袵	裔	裘	裙	裝	裹	褂	褐	裴	裨	裲	褄	褌	褊
	E5EE	褓	褒	褫	褥	褪	褶	褸	襄	褻	褶	褸	褝	禪	襠	襞	
	E63F		襦	襤	襭	襪	襷	襴	襷								
西	E63F									西	覃	覈	覊				
見	E63F													覓	覗	覡	覦
	E64F	覦	覬	覲	覿	覺	覽	覿	觀								
角	E64F									觚	觜	觝	觧	觴	觸		
言	E64F															訃	訖
	E65F	訐	訌	訛	訝	訥	訶	詁	詛	詒	詆	詈	詼	詭	詬	詢	詆
	E66F	誂	誄	誨	誡	誑	誥	誦	誚	誣	諄	諍	諂	諚	諫	諳	諧
	E680	諤	諱	謔	諠	諢	諷	諞	諛	謌	謇	謚	諡	謖	謗	謠	
	E690	謳	鞫	謦	謫	謾	謨	譁	譌	譏	譎	證	譖	譖	譚	譫	
	E69E		譟	譬	譯	譴	譽	讀	讌	讎	讒	讓	讖	讙	讚		
谷	E69E															豸	豁
	E6AE	谿															
豆	E6AE		豈	豌	豎	豐											
豕	E6AE						豕	豢	豬								
豸	E6AE									豸	豺	貂	貉	貊	貍	貔	
	E6BE	貘	貔	貘													
貝	E6BE				貶	貭	貪	貽	貲	貳	貳	貶	賈	賁	賤	賣	賚
	E6CE	賽	賺	賻	贄	贅	贊	贇	贏	贍	贖	贔	贓	賊	贔	贖	

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
赤	E6CE																赧
	E6DE	赭															
走	E6DE			赱	赳	趁	趁										
足	E6DE						跂	趾	趺	跏	跚	跖	跌	跛	跋	跪	跫
	E6EE	跟	跣	跼	跾	踉	跿	踝	踞	踐	踟	踉	踵	踰	踴	蹊	
	E73F		踏	踓	踔	踖	踠	踥	蹤	蹠	蹤	蹣	蹕	蹶	蹲	蹼	躁
	E74F	躇	躅	躄	躋	躊	躓	躑	躔	躙	躪	躡					
身	E74F												躬	躰	體	躱	躾
	E75F	軀	軈														
車	E75F			軋	軛	軦	軼	軻	軫	軾	軽	軺	軽	軏	轍	軼	軫
	E76F	較	輌	輌	輦	輳	輻	輹	轅	轂	轆	轌	轉	轡	轎	轗	轜
	E780	轢	轣	轤													
辛	E780				辜	辟	辣	辭	辯								
辶	E780									辶	迚	迥	迢	迪	迯	邇	迴
	E790	逅	迹	逎	逮	逕	逡	逍	逞	逖	逋	逕	逶	逵	達	迸	
	E79E		遏	遐	遑	遒	逎	遖	遉	遖	遘	遞	遨	遯	遨	遶	遲
	E7AE	邂	遽	邁	遨	邊	邉	邏									
邑	E7AE								邨	邯	邱	邵	郢	郤	扈	郛	鄂
	E7BE	鄒	鄙	鄢	鄰												
酉	E7BE					酊	酖	酘	酣	酥	酩	酳	酲	醋	醉	醂	醢
	E7CE	醫	醢	醪	醸	醴	醺	釀	釁								
采	E7CE									釉	釋						
里	E7CE											釐					
金	E7CE												釦	釁	釜	釗	釵
	E7DE	釼	釶	鈎	釿	鈔	鈬	鈕	鈑	鉞	鉗	鉅	鉉	鉤	鉈	鉸	鈿
	E7EE	鉋	鉐	鉤	鉄	鉾	銛	鉚	鋏	銹	銷	鋩	錻	鋺	錙		
	E83F		錙	錢	錚	錣	錻	錵	錻	鍜	鍠	鍼	鍮	鍖	鎰	鎬	鎭
	E84F	鎔	鎹	鏖	鏗	鏨	鏥	鏘	鏃	鏝	鏐	鏈	鏤	鐚	鐔	鐓	鐃
	E85F	鐫	鐐	鐶	鐫	鐵	鐵	鐺	鑁	鑒	鑄	鑛	鑠	鑢	鑞	鑪	鈩
	E86F	鑰	鑵	鑷	鑚	鑚	鑼	鑾	钁	鑿							
門	E86F										閂	閇	問	閔	閖	閘	閙
	E880	閏	閨	閧	閭	閖	閻	閹	閾	闊	濶	闃	闍	闌	闕	闔	闖
	E890	關	闡	闥	闢												
阜	E890					阡	阨	阮	阯	陂	陌	陏	陋	陷	陜	陞	

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
阜	E89E		陝	陟	陶	陲	陬	隍	隘	隕	隗	險	隧	隱	隹	隰	隴
隶	E8AE	隶	隷														
隹	E8AE			隹	雎	雋	雉	雍	襍	雜	霍	雕					
雨	E8AE												雹	霄	霆	霈	霓
	E8BE	雰	雷	雳	雾	霎	霤	霪	霰	霹	霽	霾	靄	靆	靈	靂	靉
青	E8CE	靜															
非	E8CE		靠														
面	E8CE			靤	靦	靨											
革	E8CE						勒	靫	靭	靹	鞅	靼	鞁	靺	鞆	鞄	鞋
	E8DE	鞑	鞜	鞨	鞦	鞳	鞴	鞸	韃	韈	韋			鞏			
韋	E8DE											韋	韜				
韭	E8DE													韭	韲	韮	
音	E8DE																竟
	E8EE	韶	韵														
頁	E8EE			頇	頌	頸	頤	頡	頷	頽	顆	顏	顋	顫	顯	顰	
	E93F		顱	顴	顳												
風	E93F					颪	颯	颱	颶	飄	飃	飆					
食	E93F												飩	飫	飭	飴	飼
	E94F	餔	餘	餡	餉	餞	餤	餅	餬	餮	餽	餾	饂	饉	饅	饐	饋
	E95F	饑	饒	饌	饕												
首	E95F					馗	馘										
香	E95F							馥									
馬	E95F								馭	馮	馼	駟	駛	駝	駘	駑	駭
	E96F	駮	駱	駲	駸	駿	騁	騏	騅	騒	騙	騫	騒	驅	驂	驀	驃
	E980	驟	驕	驍	驛	驗	驟	驢	驤	驤	驩	驫	驪				
骨	E980													骭	骰	骼	髀
	E990	髏	髑	髓	體												
高	E990					髞											
髟	E990						髟	髫	髣	髴	髯	髱	髮	髯	髫	髭	
	E99E		髻	鬆	鬘	鬚	鬟	鬢	鬣								
鬥	E99E									鬥	鬧	鬨	鬩	鬪	鬮		
鬯	E99E															鬯	
鬲	E99E																鬲
鬼	E9AE	魄	魅	魏	魍	魎	魑	魘									

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
魚	E9AE								魴	鮓	鮃	鮑	鮖	鮟	鮱	鮫	鮭
	E9BE	鮴	鮹	鯊	鯏	鯑	鯒	鯓	鯔	鯣	鯢	鯤	鯰	鯡	鯵	鯲	鯱
	E9CE	鯷	鰀	鰔	鰉	鰓	鰌	鰆	鰈	鰒	鰕	鰔	鰛	鰮	鰯	鰰	鰹
	E9DE	鰺	鰻	鰲	鰾	鰾	鱈	鱒	鱧	鱶	鱸						
鳥	E9DE											鳧	鳬	鳰	鳩	鳳	
	E9EE	鳶	鴃	鴆	鴦	鶯	鴣	鴟	鵄	鴕	鴒	鴇	鴿	鵁	鵜	鵡	
	EA3F		鵝	鵞	鵩	鵑	鵐	鵙	鵲	鶉	鶇	鶫	鶺	鶲	鶴	鶸	鷲
	EA4F	鷁	鶏	鷂	鶻	鶸	鶺	鷆	鷏	鷂	鷙	鷓	鷸	鷹	鷯	鷽	鸞
	EA5F	鸚	鸛	鸞													
鹵	EA5F				鹵	鹹	鹽										
鹿	EA5F							麁	塵	麋	麕	麒	麕	麗	麝		
麥	EA5F															麥	麩
	EA6F	麸	麺	麭													
麻	EA6F				靡												
黄	EA6F					黌											
黍	EA6F						黎	黏	黝								
黒	EA6F									黔	黜	點	黝	黠	黥	黨	黯
	EA80	黴	黶	黷													
黹	EA80				黹	黻	黼										
黽	EA80							黽	鼇	鼈							
皷	EA80										皷	鼕					
鼠	EA80												鼬	鼬			
鼻	EA80														鼾		
齊	EA80															齊	
齒	EA80																齒
	EA90	齔	齣	齟	齠	齢	齦	齧	齬	齪	齷	齲	齶				
龍	EA90													龕			
龜	EA90														龜		
龠	EA90															龠	

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10.7 2D code

DataMatrix (ECC200)

ESC+2D50

Hexadecimal code	ESC	2D50	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<35>_{16}<30>_{16}$	,aa,bb,ccc,ddd
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify DataMatrix (ECC200).

[Format](setting part)
<2D50>,aa,bb,ccc,ddd

●Parameter

a[Horizontal cell size]	=	Valid range	:	01 ～ 99(dots)
b[Vertical cell size]	=	Valid range	:	01 ～ 99(dots)
c[Number of cells per line]	=	Valid range	:	010～144
		000	:	Auto setting
d[Number of cell lines]	=	Valid range	:	008～144
		000	:	Auto setting

[Format](data part)
<DN>mmmm,n～n

●Parameter

m[Number of data]	=	Valid range	:	1~3116
n[Print data]	=	data		

* Specify [7EH, 7EH] when printing 7EH.
* The code will not be printed when a parameter other than above is specified or number of print data does not match.

[Coding Example] Horizontal cell size: 3dots, Vertical cell size: 3dots
<A>
<V>100<H>200**<2D50>,03,03,000,000**
<DN>0010,0123456789
<Z>



[Notes]
1. The code will not be printed when a parameter other than above is specified or number of print data does not match.
2. Specify more than 2mm blank space around the DataMatrix code as a margin for scanner readability when specifying the print format.
3. Specify [7EH, 7EH] when printing 7EH. The number of data is [0002].
4. When auto setting (000) is specified in the "number of cells per 1 line" and "number of cell lines", square DataMatrix is printed.

Data format	Number of data
Numeric	3116
Alphanumeric	2335
Binary(00H~FFH)	1556

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* The symbol size of DataMatrix(ECC200) is fixed to the following 30 types.

"Symbol size and number of data for DataMatrix(ECC200)"

Symbol size			The maximum value for the data digit		
Number of cells per 1 line (c)	Number of Cell lines(d)	Number of blocks	Numeric	Alphanumeric	Binary
10	10	1	6	3	1
12	12	1	10	6	3
14	14	1	16	10	6
16	16	1	24	16	10
18	18	1	36	25	16
20	20	1	44	31	20
22	22	1	60	43	28
24	24	1	72	52	34
26	26	1	88	64	42
32	32	4	124	91	60
36	36	4	172	127	84
40	40	4	228	169	112
44	44	4	288	214	142
48	48	4	348	259	172
52	52	4	408	304	202
64	64	16	560	418	278
72	72	16	736	550	366
80	80	16	912	682	454
88	88	16	1152	862	574
96	96	16	1392	1042	694
104	104	16	1632	1222	814
120	120	36	2100	1573	1048
132	132	36	2608	1954	1302
144	144	36	3116	2335	1556
18	8	1	10	6	3
32	8	2	20	13	8
26	12	1	32	22	14
36	12	2	44	31	20
36	16	2	64	46	30
48	16	2	98	72	47

* Numeric, alphanumeric and mix of the control code varies depending on the combined number of characters.

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DataMatrix (ECC200)-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[00H to FFH] are available in DataMatrix.
Specify [7EH, 7EH] when printing 7EH.

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10.8 2D code

GS1 DataMatirx

ESC+2D51

Hexadecimal code	ESC	2D51	Parameter
	$<1B>_{16}$	$<32>_{16}<44>_{16}<35>_{16}<31>_{16}$	,aa,bb,ccc,ddd
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify GS1 DataMatrix.

[Format](setting part)
<2D51>,aa,bb,ccc,ddd

●Parameter

a[Horizontal cell size]	=	Valid range	:	01 ～ 99(dots)
b[Vertical cell size]	=	Valid range	:	01 ～ 99(dots)
c[Number of cells per line]	=	Valid range	:	010～144
		000	:	Auto setting
d[Number of cell l lines]	=	Valid range	:	008～144
		000	:	Auto setting

[Format](data part)
<DN>mmmm,n～n

●Parameter

m [Number of data]	=	Valid range	:	1~3116
n [Print data]	=	data		

* Specify [7EH, 7EH] when printing 7EH.
* Specify [1BH, 1BH] when printing 1BH.
* Specify [1BH, 31H] when printing FNC1.
* The contents of the code will not be guaranteed when parameter other than above is specified or number of print data does not match.

[Coding Example] Horizontal cell size: 3dots, Vertical cell size: 3dots
<A>
<V>100<H>200**<2D51>,03,03,000,000**
<DN>0014,$<1B>_{16}$1100123456789
<Z>
* $<1B>_{16}$ is referring to 1BH in the character code.

[Notes]
1. The code will not be printed when a parameter other than above is specified or number of digits in the number of data and print data do not match.
2. Specify more than 2mm blank space around the DataMatrix code as a margin for scanner readability when specifying the print format.
3. Specify [7EH, 7EH] when printing 7EH. The number of data is [0002].
4. When [7EH] is specified solely, the command error occurs and the code will not be printed.
5. Specify [1BH, 1BH] when printing 1BH. The number of data is [0002].
6. Specify [1BH, 31H] when printing FNC1. The number of data is [0002].
7. When [1BH] is specified solely, the printing and the contents are not guaranteed.
8. When auto setting (000) is specified in the "number of cells per 1 line" and "number of cell lines", square DataMatrix is printed.
9. When the same value other than 000 is specified (manual setting) in the "number of cells per 1 line" and "number of cell lines", square DataMatrix is printed.
10. When different value other than 000 is specified (manual setting) in the "number of cells per 1 line" and "number of cell lines", rectangle DataMatrix is printed.
11. The number of data can be specified in the data part depends on the data format. Available number of data is as follows. (Number of cells is auto setting or the maximum cell number is specified):

Data format	Number of data
Numeric	3116
Alphanumeric	2335
Binary(00H~FFH)	1556

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12. The symbol may not be read by a scanner when the cell size is smaller. In the above case, specify enough cell size for the scanner.
13. The symbol size available in the GS1 DataMatrix is limited to the 30 types in the below table. Also, the maximum number of data is limited depending on the symbol size. Refer to the "The maximum digit of the number of data" table.
14. Make sure to specify 1BH and 31H at the beginning of the data.

"Symbol size and number of data for GS1 DataMatrix"

Symbol size			The maximum value for the data digit		
Number of cells per 1 line (c)	Cell lines(d)	Number of blocks	Numeric	Alphanumeric	Binary
10	10	1	6	3	1
12	12	1	10	6	3
14	14	1	16	10	6
16	16	1	24	16	10
18	18	1	36	25	16
20	20	1	44	31	20
22	22	1	60	43	28
24	24	1	72	52	34
26	26	1	88	64	42
32	32	4	124	91	60
36	36	4	172	127	84
40	40	4	228	169	112
44	44	4	288	214	142
48	48	4	348	259	172
52	52	4	408	304	202
64	64	16	560	418	278
72	72	16	736	550	366
80	80	16	912	682	454
88	88	16	1152	862	574
96	96	16	1392	1042	694
104	104	16	1632	1222	814
120	120	36	2100	1573	1048
132	132	36	2608	1954	1302
144	144	36	3116	2335	1556
18	8	1	10	6	3
32	8	2	20	13	8
26	12	1	32	22	14
36	12	2	44	31	20
36	16	2	64	46	30
48	16	2	98	72	47

* Numeric, alphanumeric and mix of the control code varies depending on the combined number of characters.

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GS1 DataMatrix-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	T								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

	Data n	**Data n+1**
FNC1	1BH	31H

"00H to FFH" are available in GS1 DataMatrix.
Specify [7EH, 7EH] when printing 7EH.
Specify [1BH, 1BH] when printing 1BH.
Specify [1BH, 31H] when printing FNC1.

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10.9 2D code

QR Code (Compatible Commands)

ESC+BQ

Hexadecimal code	ESC	BQ	Parameter
	$<1B>_{16}$	$<42>_{16}<51>_{16}$	Manual setting abcc,(ddeeff,)g(hhhh)n Auto setting abcc,(ddeeff,)n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify the QR Code.

[Format]

[Manual setting] <BQ>abcc,(ddeeff)g(hhhh)n

[Auto setting] <BQ>abcc,(ddeeff) n

●Parameter

a[Error correction level(error correction)] = 1 : 7% High density Level(L)
2 : 15% Standard Level(M)
3 : 30% Ultra High Reliability Level(H)
4 : 25% High Reliability Level(Q)

b[Combine mode] = 0 : Normal mode
1 : Combine mode

c[Size of a side] = Valid range: 01～99(dots)

Example) cc=04



d[Division number of combine mode] = Valid range : 01 ～ 16

e[Sequential number of divided combine mode] = Valid range : 01 ～ 16

f[Parity data of combine mode] = Valid range : 00 ～ FF

g[Character mode] = 1 : Numeric mode
2 : Alphanumeric mode
3 : Binary mode
4 : Kanji mode

h[Number of data] = Valid range : 01～7366(dots)

n[Print data] = data

[Coding Example] Error correction level: 30%, Combine mode: Normal, Size of a side: 10

<A>

<V>100<H>200**<BQ>3010,112345**

<Q>2

<Z>

[Notes]

1. Specify the data that is a calculation (exclusive OR) of all divided QR code print data in HEX.
2. It is not necessary to specify the number of data parameter when the character mode is other than the binary mode.

[Important]

This command is for exsiting models.Using QR Code(Model 2) command <2D30> and QR Code(Model 2)command <2D31> is recommended

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QR Code data size table (for model1)

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
1 21X21	L	40	24	10	17
	M	33	20	8	14
	Q	25	15	6	11
	H	16	10	4	7
2 25X25	L	81	49	20	34
	M	66	40	17	28
	Q	52	31	13	22
	H	33	20	8	14
3 29X29	L	131	79	33	55
	M	100	60	25	42
	Q	81	49	20	34
	H	52	31	13	22
4 33X33	L	186	113	48	78
	M	138	84	35	58
	Q	114	69	29	48
	H	76	46	19	32
5 37X37	L	253	154	65	106
	M	191	116	49	80
	Q	157	95	40	66
	H	105	63	27	44
6 41X41	L	321	194	82	134
	M	249	151	64	104
	Q	201	122	51	84
	H	133	81	34	56
7 45X45	L	402	244	103	168
	M	311	188	80	130
	Q	253	154	65	106
	H	167	101	43	70
8 49X49	L	493	299	126	206
	M	378	229	97	158
	Q	301	183	77	126
	H	203	123	52	85
9 53X53	L	585	354	150	244
	M	441	267	113	184
	Q	369	223	94	154
	H	239	145	61	100
10 57X57	L	690	418	177	287
	M	526	319	135	219
	Q	433	262	111	180
	H	291	176	74	121

Version	Error Correction	Numeric	Alpha-Numeric	Kanji	Binary
11 61X61	L	800	485	205	333
	M	608	368	156	253
	Q	493	299	126	205
	H	342	207	87	142
12 65X65	L	915	555	234	381
	M	694	421	178	289
	Q	579	351	148	241
	H	390	236	100	162
13 69X69	L	1030	624	264	429
	M	790	479	202	329
	Q	656	398	168	273
	H	454	275	116	189
14 73X73	L	1167	707	299	486
	M	877	531	225	365
	Q	738	447	189	307
	H	498	302	127	207

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QR Code (Numeric mode)-Code Table

					S				I				S				0			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0				0												
0	0	0	1	1				1												
0	0	1	0	2				2												
0	0	1	1	3				3												
0	1	0	0	4				4												
0	1	0	1	5				5												
0	1	1	0	6				6												
0	1	1	1	7				7												
1	0	0	0	8				8												
1	0	0	1	9				9												
1	0	1	0	A																
1	0	1	1	B																
1	1	0	0	C																
1	1	0	1	D																
1	1	1	0	E																
1	1	1	1	F																

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QR Code (Alphanumeric mode)-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0		P										
0	0	0	1	1				1	A	Q										
0	0	1	0	2				2	B	R										
0	0	1	1	3				3	C	S										
0	1	0	0	4			$	4	D	T										
0	1	0	1	5			%	5	E	U										
0	1	1	0	6				6	F	V										
0	1	1	1	7				7	G	W										
1	0	0	0	8				8	H	X										
1	0	0	1	9				9	I	Y										
1	0	1	0	A			*	:	J	Z										
1	0	1	1	B			+		K											
1	1	0	0	C					L											
1	1	0	1	D			−		M											
1	1	1	0	E			.		N											
1	1	1	1	F			/		O											

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QR Code (Binary mode)-Code Table

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	B3	B2	B1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0			SP	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2			″	2	B	R	b	r								
0	0	1	1	3			#	3	C	S	c	s								
0	1	0	0	4			$	4	D	T	d	t								
0	1	0	1	5			%	5	E	U	e	u								
0	1	1	0	6			&	6	F	V	f	v								
0	1	1	1	7			’	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	x								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	\	l	|								
1	1	0	1	D			−	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o	DEL								

[00H to 7FH], [A0H to DFH] are available in the QR code.

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QR Code (Kanji mode)-Code Table

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Symbol	813F		SP	、	。	,	.	・	:	;	?	!	゛	°	´	`	¨
	814F	^	￣	_	ヽ	ヾ	ゝ	ゞ	〃	仝	々	〆	〇	―	―	-	/
	815F	＼	～	∥	｜	…	‥	‘	‘	“	”	(	)	〔	〕	[	]
	816F	{	}	〈	〉	《	》	「	」	『	』	【	】	+	−	±	×
	8180	÷	=	≠	<	>	≦	≧	∞	∴	♂	♀	°	′	″	℃	¥
	8190	$	¢	£	%	#	&	*	@	§	☆	★	○	●	◎	◇	
	819E		◆	□	■	△	▲	▽	▼	※	〒	→	←	↑	↓	=	
Alphanumeric	824F	0	1	2	3	4	5	6	7	8	9						
	825F		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
	826F	P	Q	R	S	T	U	V	W	X	Y	Z					
	8280		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
	8290	p	q	r	s	t	u	v	w	x	y	z					
Hiragana	829E		ぁ	あ	ぃ	い	ぅ	う	ぇ	え	ぉ	お	か	が	き	ぎ	く
	82AE	ぐ	け	げ	こ	ご	さ	ざ	し	じ	す	ず	せ	ぜ	そ	ぞ	た
	82BE	だ	ち	ぢ	っ	つ	づ	て	で	と	ど	な	に	ぬ	ね	の	は
	82CE	ば	ぱ	ひ	び	ぴ	ふ	ぶ	ぷ	へ	べ	ぺ	ほ	ぼ	ぽ	ま	み
	82DE	む	め	も	ゃ	や	ゅ	ゆ	ょ	よ	ら	り	る	れ	ろ	ゎ	わ
	82EE	ゐ	ゑ	を	ん												
Katakana	833F		ァ	ア	ィ	イ	ゥ	ウ	ェ	エ	ォ	オ	カ	ガ	キ	ギ	ク
	834F	グ	ケ	ゲ	コ	ゴ	サ	ザ	シ	ジ	ス	ズ	セ	ゼ	ソ	ゾ	タ
	835F	ダ	チ	ヂ	ッ	ツ	ヅ	テ	デ	ト	ド	ナ	ニ	ヌ	ネ	ノ	ハ
	836F	バ	パ	ヒ	ビ	ピ	フ	ブ	プ	ヘ	ベ	ペ	ホ	ボ	ポ	マ	ミ
	8380	ム	メ	モ	ャ	ヤ	ュ	ユ	ョ	ヨ	ラ	リ	ル	レ	ロ	ヮ	ワ
	8390	ヵ	ヶ	ヲ	ン	ヴ	ヵ	ヶ									
Greek Alphabet	839E		Α	Β	Γ	Δ	Ε	Ζ	Η	Θ	Ι	Κ	Λ	Μ	Ν	Ξ	Ο
	83AE	Π	Ρ	Σ	Τ	Υ	Φ	Χ	Ψ	Ω							
	83BE		α	β	γ	δ	ε	ζ	η	θ	ι	κ	λ	μ	ν	ξ	ο
	83CE	π	ρ	σ	τ	υ	φ	χ	ψ	ω							
Russian Alphabet	843F		А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н
	844F	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э
	845F	Ю	Я														
	846F		а	б	в	г	д	е	ё	ж	з	и	й	к	л	м	н
	8480	о	п	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э
	8490	ю	я														

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
ア	889E		亜	唖	娃	阿	哀	愛	挨	姶	逢	葵	茜	穐	悪	握	渥
	88AE	旭	葦	芦	鯵	梓	圧	斡	扱	宛	姐	虻	飴	絢	綾	鮎	或
	88BE	粟	袷	安	庵	按	暗	案	闇	鞍	杏						
イ	88BE											以	伊	位	依	偉	囲
	88CE	夷	委	威	尉	惟	意	慰	易	椅	為	畏	異	移	維	緯	胃
	88DE	萎	衣	謂	違	遺	医	井	亥	域	育	郁	磯	一	壱	溢	逸
	88EE	稲	茨	芋	鰯	允	印	咽	員	因	姻	引	飲	淫	胤	蔭	
	893F		院	陰	隠	韻	吋										
ウ	893F							右	宇	烏	羽	迂	雨	卯	鵜	窺	丑
	894F	碓	臼	渦	嘘	唄	鬱	蔚	鰻	姥	厩	浦	瓜	閏	噂	云	運
	895F	雲															
エ	895F		荏	餌	叡	営	嬰	影	映	曳	栄	永	泳	洩	瑛	盈	穎
	896F	頴	英	衛	詠	鋭	液	疫	益	駅	悦	謁	越	閲	榎	厭	円
	8980	園	堰	奄	宴	延	怨	掩	援	沿	演	炎	焔	煙	燕	猿	縁
	8990	艶	苑	薗	遠	鉛	鴛	塩									
オ	8990								於	汚	甥	凹	央	奥	往	応	
	899E		押	旺	横	欧	殴	王	翁	襖	鴬	鴎	黄	岡	沖	荻	億
	89AE	屋	憶	臆	桶	牡	乙	俺	卸	恩	温	穏	音				
カ	89AE													下	化	仮	何
	89BE	伽	価	佳	加	可	嘉	夏	嫁	家	寡	科	暇	果	架	歌	河
	89CE	火	珂	禍	禾	稼	箇	花	苛	茄	荷	華	菓	蝦	課	嘩	貨
	89DE	迦	過	霞	蚊	俄	峨	我	牙	画	臥	芽	蛾	賀	雅	餓	駕
	89EE	介	会	解	回	塊	壊	廻	快	怪	悔	恢	懐	戒	拐	改	
	8A3F		魁	晦	械	海	灰	界	皆	絵	芥	蟹	開	階	貝	凱	劾
	8A4F	外	咳	害	崖	慨	概	涯	碍	蓋	街	該	鎧	骸	浬	馨	蛙
	8A5F	垣	柿	蛎	鈎	劃	嚇	各	廓	拡	撹	格	核	殻	獲	確	穫
	8A6F	覚	角	赫	較	郭	閣	隔	革	学	岳	楽	額	顎	掛	笠	樫
	8A80	橿	梶	鰍	潟	割	喝	恰	括	活	渇	滑	葛	褐	轄	且	鰹
	8A90	叶	椛	樺	鞄	株	兜	竃	蒲	釜	鎌	噛	鴨	栢	茅	萱	
	8A9E		粥	刈	苅	瓦	乾	侃	冠	寒	刊	勘	勧	巻	喚	堪	姦
	8AAE	完	官	寛	干	幹	患	感	慣	憾	換	敢	柑	桓	棺	款	歓
	8ABE	汗	漢	澗	潅	環	甘	監	看	竿	管	簡	緩	缶	翰	肝	艦
	8ACE	莞	観	諌	貫	還	鑑	間	閑	関	陥	韓	館	舘	丸	含	岸
	8ADE	巌	玩	癌	眼	岩	翫	贋	雁	頑	顔	願					

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
キ	8ADE												企	伎	危	喜	器
	8AEE	基	奇	嬉	寄	岐	希	幾	忌	揮	机	旗	既	期	棋	棄	
	8B3F		機	帰	毅	気	汽	畿	祈	季	稀	紀	徽	規	記	貴	起
	8B4F	軌	輝	飢	騎	鬼	亀	偽	儀	妓	宜	戯	技	擬	欺	犠	疑
	8B5F	祇	義	蟻	誼	議	掬	菊	鞠	吉	吃	喫	桔	橘	詰	砧	杵
	8B6F	黍	却	客	脚	虐	逆	丘	久	仇	休	及	吸	宮	弓	急	救
	8B80	朽	求	汲	泣	灸	球	究	窮	笈	級	糾	給	旧	牛	去	居
	8B90	巨	拒	拠	挙	渠	虚	許	距	鋸	漁	禦	魚	亨	享	京	
	8B9E		供	侠	僑	兇	競	共	凶	協	匡	卿	叫	喬	境	峡	強
	8BAE	彊	怯	恐	恭	挟	教	橋	況	狂	狭	矯	胸	脅	興	蕎	郷
	8BBE	鏡	響	饗	驚	仰	凝	尭	暁	業	局	曲	極	玉	桐	粁	僅
	8BCE	勤	均	巾	錦	斤	欣	欽	琴	禁	禽	筋	緊	芹	菌	衿	襟
	8BDE	謹	近	金	吟	銀											
ク	8BDE						九	倶	句	区	狗	玖	矩	苦	躯	駆	駈
	8BEE	駒	具	愚	虞	喰	空	偶	寓	遇	隅	串	櫛	釧	屑	屈	
	8C3F		掘	窟	沓	靴	轡	窪	熊	隈	粂	栗	繰	桑	鍬	勲	君
	8C4F	薫	訓	群	軍	郡											
ケ	8C4F						卦	袈	祁	係	傾	刑	兄	啓	圭	珪	型
	8C5F	契	形	径	恵	慶	慧	憩	掲	携	敬	景	桂	渓	畦	稽	系
	8C6F	経	継	繋	罫	茎	荊	蛍	計	詣	警	軽	頚	鶏	芸	迎	鯨
	8C80	劇	戟	撃	激	隙	桁	傑	欠	決	潔	穴	結	血	訣	月	件
	8C90	倹	倦	健	兼	券	剣	喧	圏	堅	嫌	建	憲	懸	拳	捲	
	8C9E		検	権	牽	犬	献	研	硯	絹	県	肩	見	謙	賢	軒	遣
	8CAE	鍵	険	顕	験	鹸	元	原	厳	幻	弦	減	源	玄	現	絃	舷
	8CBE	言	諺	限													
コ	8CBE				乎	個	古	呼	固	姑	孤	己	庫	弧	戸	故	枯
	8CCE	湖	狐	糊	袴	股	胡	菰	虎	誇	跨	鈷	雇	顧	鼓	五	互
	8CDE	伍	午	呉	吾	娯	後	御	悟	梧	檎	瑚	碁	語	誤	護	醐
	8DEE	乞	鯉	交	佼	侯	候	倖	光	公	功	効	勾	厚	口	向	
	8D3F		后	喉	坑	垢	好	孔	孝	宏	工	巧	巷	幸	広	庚	康
	8D4F	弘	恒	慌	抗	拘	控	攻	昂	晃	更	杭	校	梗	構	江	洪
	8D5F	浩	港	溝	甲	皇	硬	稿	糠	紅	紘	絞	綱	耕	考	肯	肱
	8D6F	腔	膏	航	荒	行	衡	講	貢	購	郊	酵	鉱	砿	鋼	閤	降
	8D80	項	香	高	鴻	剛	劫	号	合	壕	拷	濠	豪	轟	麹	克	刻

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コ	8D90	告	国	穀	酷	鵠	黒	獄	漉	腰	甑	忽	惚	骨	狛	込	
	8D9E		此	頃	今	困	坤	墾	婚	恨	懇	昏	昆	根	梱	混	痕
	8DAE	紺	艮	魂													
サ	8DAE				些	佐	叉	唆	嵯	左	差	査	沙	瑳	砂	詐	鎖
	8DBE	裟	坐	座	挫	債	催	再	最	哉	塞	妻	宰	彩	才	採	栽
	8DCE	歳	済	災	采	犀	砕	砦	祭	斎	細	菜	裁	載	際	剤	在
	8DDE	材	罪	財	冴	坂	阪	堺	榊	肴	咲	崎	埼	碕	鷺	作	削
	8DEE	咋	搾	昨	朔	柵	窄	策	索	錯	桜	鮭	笹	匙	冊	刷	
	8E3F		察	拶	撮	擦	札	殺	薩	雑	皐	鯖	捌	錆	鮫	皿	晒
	8E4F	三	傘	参	山	惨	撒	散	桟	燦	珊	産	算	纂	蚕	讃	賛
	8E5F	酸	餐	斬	暫	残											
シ	8E5F						仕	仔	伺	使	刺	司	史	嗣	四	士	始
	8E6F	姉	姿	子	屍	市	師	志	思	指	支	孜	斯	施	旨	枝	止
	8E80	死	氏	獅	祉	私	糸	紙	紫	肢	脂	至	視	詞	詩	試	誌
	8E90	諮	資	賜	雌	飼	歯	事	似	侍	児	字	寺	慈	持	時	
	8E9E		次	滋	治	爾	璽	痔	磁	示	而	耳	自	蒔	辞	汐	鹿
	8EAE	式	識	鴫	竺	軸	宍	雫	七	叱	執	失	嫉	室	悉	湿	漆
	8EBE	疾	質	実	蔀	篠	偲	柴	芝	屡	蕊	縞	舎	写	射	捨	赦
	8ECE	斜	煮	社	紗	者	謝	車	遮	蛇	邪	借	勺	尺	杓	灼	爵
	8EDE	酌	釈	錫	若	寂	弱	惹	主	取	守	手	朱	殊	狩	珠	種
	8EEE	腫	趣	酒	首	儒	受	呪	寿	授	樹	綬	需	囚	収	周	
	8F3F		宗	就	州	修	愁	拾	洲	秀	秋	終	繍	習	臭	舟	蒐
	8F4F	衆	襲	讐	蹴	輯	週	酋	酬	集	醜	什	住	充	十	従	戎
	8F5F	柔	汁	渋	獣	縦	重	銃	叔	夙	宿	淑	祝	縮	粛	塾	熟
	8F6F	出	術	述	俊	峻	春	瞬	竣	舜	駿	准	循	旬	楯	殉	淳
	8F80	準	潤	盾	純	巡	遵	醇	順	処	初	所	暑	曙	渚	庶	緒
	8F90	署	書	薯	藷	諸	助	叙	女	序	徐	恕	鋤	除	傷	償	
	8F9E		勝	匠	升	召	哨	商	唱	嘗	奨	妾	娼	宵	将	小	少
	8FAE	尚	庄	床	廠	彰	承	抄	招	掌	捷	昇	昌	昭	晶	松	梢
	8FBE	樟	樵	沼	消	渉	湘	焼	焦	照	症	省	硝	礁	祥	称	章
	8FCE	笑	粧	紹	肖	菖	蒋	蕉	衝	裳	訟	証	詔	詳	象	賞	醤
	8FDE	鉦	鍾	鐘	障	鞘	上	丈	丞	乗	冗	剰	城	場	壌	嬢	常
	8FEE	情	擾	条	杖	浄	状	畳	穣	蒸	譲	醸	錠	嘱	埴	飾	
	903F		拭	植	殖	燭	織	職	色	触	食	蝕	辱	尻	伸	信	侵

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
シ	904F	唇	娠	寝	審	心	慎	振	新	晋	森	榛	浸	深	申	疹	真
	905F	神	秦	紳	臣	芯	薪	親	診	身	辛	進	針	震	人	仁	刃
	906F	塵	壬	尋	甚	尽	腎	訊	迅	陣	靭						
ス	906F											笥	諏	須	酢	図	厨
	9080	逗	吹	垂	帥	推	水	炊	睡	粋	翠	衰	遂	酔	錐	錘	随
	9090	瑞	髄	崇	嵩	数	枢	趨	雛	据	杉	椙	菅	頗	雀	裾	
	909E		澄	摺	寸												
セ	909E					世	瀬	畝	是	凄	制	勢	姓	征	性	成	政
	90AE	整	星	晴	棲	栖	正	清	牲	生	盛	精	聖	声	製	西	誠
	90BE	誓	請	逝	醒	青	静	斉	税	脆	隻	席	惜	戚	斥	昔	析
	90CE	石	積	籍	績	脊	責	赤	跡	蹟	碩	切	拙	接	摂	折	設
	90DE	窃	節	説	雪	絶	舌	蝉	仙	先	千	占	宣	専	尖	川	戦
	90EE	扇	撰	栓	栴	泉	浅	洗	染	潜	煎	煽	旋	穿	箭	線	
	913F		繊	羨	腺	舛	船	薦	詮	賤	践	選	遷	銭	銑	閃	鮮
	914F	前	善	漸	然	全	禅	繕	膳	糎							
ソ	914F										噌	塑	岨	措	曾	曽	楚
	915F	狙	疏	疎	礎	祖	租	粗	素	組	蘇	訴	阻	遡	鼠	僧	創
	916F	双	叢	倉	喪	壮	奏	爽	宋	層	匝	惣	想	捜	掃	挿	掻
	9180	操	早	曹	巣	槍	槽	漕	燥	争	痩	相	窓	糟	総	綜	聡
	9190	草	荘	葬	蒼	藻	装	走	送	遭	鎗	霜	騒	像	増	憎	
	919E		臓	蔵	贈	造	促	側	則	即	息	捉	束	測	足	速	俗
	91AE	属	賊	族	続	卒	袖	其	揃	存	孫	尊	損	村	遜		
タ	91AE															他	多
	91BE	太	汰	詑	唾	堕	妥	惰	打	柁	舵	楕	陀	駄	騨	体	堆
	91CE	対	耐	岱	帯	待	怠	態	戴	替	泰	滞	胎	腿	苔	袋	貸
	91DE	退	逮	隊	黛	鯛	代	台	大	第	醍	題	鷹	滝	瀧	卓	啄
	91EE	宅	托	択	拓	沢	濯	琢	託	鐸	濁	諾	茸	凧	蛸	只	
	923F		叩	但	達	辰	奪	脱	巽	竪	辿	棚	谷	狸	鱈	樽	誰
	924F	丹	単	嘆	坦	担	探	旦	歎	淡	湛	炭	短	端	箪	綻	耽
	925F	胆	蛋	誕	鍛	団	壇	弾	断	暖	檀	段	男	談			
チ	925F														値	知	地
	926F	弛	恥	智	池	痴	稚	置	致	蜘	遅	馳	築	畜	竹	筑	蓄
	9280	逐	秩	窒	茶	嫡	着	中	仲	宙	忠	抽	昼	柱	注	虫	衷
	9290	註	酎	鋳	駐	樗	瀦	猪	苧	著	貯	丁	兆	凋	喋	寵	

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チ	929E		帖	帳	庁	弔	張	彫	徴	懲	挑	暢	朝	潮	牒	町	眺
	92AE	聴	脹	腸	蝶	調	諜	超	跳	銚	長	頂	鳥	勅	捗	直	朕
	92BE	沈	珍	賃	鎮	陳											
ツ	92BE						津	墜	椎	槌	追	鎚	痛	通	塚	栂	掴
	92CE	槻	佃	漬	柘	辻	蔦	綴	鍔	椿	潰	坪	壺	嬬	紬	爪	吊
	92DE	釣	鶴														
テ	92DE			亭	低	停	偵	剃	貞	呈	堤	定	帝	底	庭	廷	弟
	92EE	悌	抵	挺	提	梯	汀	碇	禎	程	締	艇	訂	諦	蹄	逓	
	933F		邸	鄭	釘	鼎	泥	摘	擢	敵	滴	的	笛	適	鏑	溺	哲
	934F	徹	撤	轍	迭	鉄	典	填	天	展	店	添	纏	甜	貼	転	顛
	935F	点	伝	殿	澱	田	電										
ト	935F							兎	吐	堵	塗	妬	屠	徒	斗	杜	渡
	936F	登	菟	賭	途	都	鍍	砥	砺	努	度	土	奴	怒	倒	党	冬
	9380	凍	刀	唐	塔	塘	套	宕	島	嶋	悼	投	搭	東	桃	梼	棟
	9390	盗	淘	湯	涛	灯	燈	当	痘	祷	等	答	筒	糖	統	到	
	939E		董	蕩	藤	討	謄	豆	踏	逃	透	鐙	陶	頭	騰	闘	働
	93AE	動	同	堂	導	憧	撞	洞	瞳	童	胴	萄	道	銅	峠	鴇	匿
	93BE	得	徳	涜	特	督	禿	篤	毒	独	読	栃	橡	凸	突	椴	届
	93CE	鳶	苫	寅	酉	瀞	噸	屯	惇	敦	沌	豚	遁	頓	呑	曇	鈍
ナ	93DE	奈	那	内	乍	凪	薙	謎	灘	捺	鍋	楢	馴	縄	畷	南	楠
	93EE	軟	難	汝													
ニ	93EE				二	尼	弐	迩	匂	賑	肉	虹	廿	日	乳	入	
	943F		如	尿	韮	任	妊	忍	認								
ヌ	943F									濡							
ネ	943F										禰	祢	寧	葱	猫	熱	年
	944F	念	捻	撚	燃	粘											
ノ	944F						乃	廼	之	埜	嚢	悩	濃	納	能	脳	膿
	945F	農	覗	蚤													
ハ	945F				巴	把	播	覇	杷	波	派	琶	破	婆	罵	芭	馬
	946F	俳	廃	拝	排	敗	杯	盃	牌	背	肺	輩	配	倍	培	媒	梅
	9480	楳	煤	狽	買	売	賠	陪	這	蝿	秤	矧	萩	伯	剥	博	拍
	9490	柏	泊	白	箔	粕	舶	薄	迫	曝	漠	爆	縛	莫	駁	麦	
	949E		函	箱	硲	箸	肇	筈	櫨	幡	肌	畑	畠	八	鉢	溌	発
	94AE	醗	髪	伐	罰	抜	筏	閥	鳩	噺	塙	蛤	隼	伴	判	半	反

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ハ	94BE	叛	帆	搬	斑	板	氾	汎	版	犯	班	畔	繁	般	藩	販	範
	94CE	釆	煩	頒	飯	挽	晩	番	盤	磐	蕃	蛮					
ヒ	94CE												匪	卑	否	妃	庇
	94DE	彼	悲	扉	批	披	斐	比	泌	疲	皮	碑	秘	緋	罷	肥	被
	94EE	誹	費	避	非	飛	樋	簸	備	尾	微	枇	毘	琵	眉	美	
	953F		鼻	柊	稗	匹	疋	髭	彦	膝	菱	肘	弼	必	畢	筆	逼
	954F	桧	姫	媛	紐	百	謬	俵	彪	標	氷	漂	瓢	票	表	評	豹
	955F	廟	描	病	秒	苗	錨	鋲	蒜	蛭	鰭	品	彬	斌	浜	瀕	貧
	956F	賓	頻	敏	瓶												
フ	956F					不	付	埠	夫	婦	富	冨	布	府	怖	扶	敷
	9580	斧	普	浮	父	符	腐	膚	芙	譜	負	賦	赴	阜	附	侮	撫
	9590	武	舞	葡	蕪	部	封	楓	風	葺	蕗	伏	副	復	幅	服	
	959E		福	腹	複	覆	淵	弗	払	沸	仏	物	鮒	分	吻	噴	墳
	95AE	憤	扮	焚	奮	粉	糞	紛	雰	文	聞						
ヘ	95AE											丙	併	兵	塀	幣	平
	95BE	弊	柄	並	蔽	閉	陛	米	頁	僻	壁	癖	碧	別	瞥	蔑	箆
	95CE	偏	変	片	篇	編	辺	返	遍	便	勉	娩	弁	鞭			
ホ	95CE														保	舗	鋪
	95DE	圃	捕	歩	甫	補	輔	穂	募	墓	慕	戊	暮	母	簿	菩	倣
	95EE	俸	包	呆	報	奉	宝	峰	峯	崩	庖	抱	捧	放	方	朋	
	963F		法	泡	烹	砲	縫	胞	芳	萌	蓬	蜂	褒	訪	豊	邦	鋒
	964F	飽	鳳	鵬	乏	亡	傍	剖	坊	妨	帽	忘	忙	房	暴	望	某
	965F	棒	冒	紡	肪	膨	謀	貌	貿	鉾	防	吠	頬	北	僕	卜	墨
	966F	撲	朴	牧	睦	穆	釦	勃	没	殆	堀	幌	奔	本	翻	凡	盆
マ	9680	摩	磨	魔	麻	埋	妹	昧	枚	毎	哩	槙	幕	膜	枕	鮪	柾
	9690	鱒	桝	亦	俣	又	抹	末	沫	迄	侭	繭	麿	万	慢	満	
	969E		漫	蔓													
ミ	969E				味	未	魅	巳	箕	岬	密	蜜	湊	蓑	稔	脈	妙
	96AE	粍	民	眠													
ム	96AE				務	夢	無	牟	矛	霧	鵡	椋	婿	娘			
メ	96AE														冥	名	命
	96BE	明	盟	迷	銘	鳴	姪	牝	滅	免	棉	綿	緬	面	麺		
モ	96BE															摸	模
	96CE	茂	妄	孟	毛	猛	盲	網	耗	蒙	儲	木	黙	目	杢	勿	餅

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モ	96DE	尤	戻	籾	貰	問	悶	紋	門	匁							
ヤ	96DE										也	冶	夜	爺	耶	野	弥
	96EE	矢	厄	役	約	薬	訳	躍	靖	柳	薮	鑓					
ユ	96EE												愉	愈	油	癒	
	973F		諭	輸	唯	佑	優	勇	友	宥	幽	悠	憂	揖	有	柚	湧
	974F	涌	猶	猷	由	祐	裕	誘	遊	邑	郵	雄	融	夕			
ヨ	974F														予	余	与
	975F	誉	輿	預	傭	幼	妖	容	庸	揚	揺	擁	曜	楊	様	洋	溶
	976F	熔	用	窯	羊	耀	葉	蓉	要	謡	踊	遥	陽	養	慾	抑	欲
	9780	沃	浴	翌	翼	淀											
ラ	9780						羅	螺	裸	来	莱	頼	雷	洛	絡	落	酪
	9790	乱	卵	嵐	欄	濫	藍	蘭	覧								
リ	9790									利	吏	履	李	梨	理	璃	
	979E		痢	裏	裡	里	離	陸	律	率	立	葎	掠	略	劉	流	溜
	97AE	琉	留	硫	粒	隆	竜	龍	侶	慮	旅	虜	了	亮	僚	両	凌
	97BE	寮	料	梁	涼	猟	療	瞭	稜	糧	良	諒	遼	量	陵	領	力
	97CE	緑	倫	厘	林	淋	燐	琳	臨	輪	隣	鱗	麟				
ル	97CE													瑠	塁	涙	累
	97DE	類															
レ	97DE		令	伶	例	冷	励	嶺	怜	玲	礼	苓	鈴	隷	零	霊	麗
	97EE	齢	暦	歴	列	劣	烈	裂	廉	恋	憐	漣	煉	簾	練	聯	
	983F		蓮	連	錬												
ロ	983F					呂	魯	櫓	炉	賂	路	露	労	婁	廊	弄	朗
	984F	楼	榔	浪	漏	牢	狼	篭	老	聾	蝋	郎	六	麓	禄	肋	録
	985F	論															
ワ	985F		倭	和	話	歪	賄	脇	惑	枠	鷲	亙	亘	鰐	詫	藁	蕨
	986F	椀	湾	碗	腕												

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
一	989E			弋	丐	丕											
丨	989E					个	丱										
丶	989E							丶	丼								
丿	989E									丿	乂	乖	乘				
乙	989E													亂			
亅	989E														亅	豫	事
	98AE	舒															
二	98AE			弍	于	亞	亟										
亠	98AE						亠	亢	亰	亳	亶						
人	98AE											从	仍	仄	仆	仂	仗
	98BE	仞	仭	仟	价	伉	佚	估	佛	佝	佗	佇	佶	侈	侏	侘	佻
	98CE	佩	佰	侑	佯	來	侖	儘	俔	俟	俎	俘	俛	俑	俚	俐	俤
	98DE	俥	倚	倨	倔	倪	倥	倅	伜	俶	倡	倩	倬	俾	俯	們	倆
	98EE	偃	假	會	偕	偬	偈	做	偖	傯	傴	傀	傚	傅	傴	傲	
	993F			僉	僊	傳	僂	僖	僞	僥	僭	僣	僮	價	僵	儉	儁	儂
	994F	儖	儕	儔	儚	儡	儺	儷	儼	儻							
儿	994F										儿	兀	兒	兌	兔	兢	競
入	995F	兩	俞														
八	995F				兮	冀											
冂	995F					冂	冏	冊	冉	冏	冑	冓	冕				
冖	995F													冖	冤	冠	冢
	996F	冩	冪														
冫	996F				冫	决	冱	冲	冰	况	冽	凅	凉	凜			
几	996F													几	處	凩	凭
	9980	凰															
凵	9980			凵	函												
刀	9980				刃	刋	刈	刎	刧	刪	刮	刳	刹	剏	剄	剋	剌
	9990	剞	剔	剪	剴	剩	剳	剿	劀	劍	劒	劒	劒	劈	劑	辨	
	999E		辦														
力	999E				劬	劭	劼	劵	勁	勍	勗	勞	勣	勦	飭	勠	勳	勵
	99AE	勸															
勹	99AE			勹	匆	匈	甸	甸	匐	匏							
匕	99AE									匕							
匚	99AE										匚	匣	匯	匱	匳		

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
亡	99AE															亡	區
十	99BE	卆	卅	丗	卉	卍	準										
卜	99BE							卞									
卩	99BE								卩	卮	卯	卻	卷				
厂	99BE													厂	厄	厠	厦
	99CE	厥	厮	厰													
厶	99CE				厶	參	篡										
又	99CE							雙	叟	曼	燮						
口	99CE											叮	叨	叭	叺	吁	吽
	99DE	呀	听	吭	吼	吮	吶	吩	吝	呎	咏	呵	咎	呟	呱	呷	呰
	99EE	咒	呻	咀	呪	咄	咐	咆	哇	咢	咸	咥	咬	哄	哈	咨	
	9A3F		咫	哂	咤	哱	哽	哘	哥	哦	唏	唔	哽	唗	哭	哺	唞
	9A4F	唘	唯	唧	唅	售	啜	啅	啖	啗	唸	唳	唧	喙	喀	咯	喊
	9A5F	喟	啻	啾	喘	喞	單	啼	喃	喻	喇	喨	嗚	嗅	嗟	嗄	嗜
	9A6F	嗤	嗔	嘔	嗷	嘖	嗾	嗽	嘛	嗹	噎	噐	營	嘴	嘶	嘲	嘸
	9A8O	噫	噤	噦	噬	噪	噣	噂	噥	噲	噧	噓	噱	響	嚶	嚴	囂
	9A9O	嚼	嚾	嚱	囀	囈	囃	囑	囓								
口	9A9O									囗	囘	囿	圀	囿	圄	圉	
	9A9E		圈	國	圍	圓	團	圖	嗇	圜							
土	9A9E										圠	圩	圳	圹	坎	圻	址	坏
	9AAE	坩	垂	垒	坡	垹	垉	垓	垠	垳	垧	垾	垞	埃	埆	埔	埒
	9ABE	埒	埜	垅	埣	堋	堙	堝	塲	堡	塢	塋	塗	毀	塒	堲	塹
	9ACE	墅	墹	墟	墫	墺	壞	墻	墸	墮	壅	壓	壑	壗	壙	壘	壝
	9ADE	壛	壤	壟													
士	9ADE				壯	壺	壹	壻	壺	壽							
夂	9ADE										夂						
夊	9ADE											夊	夐				
夕	9ADE													夛	梦	夥	
大	9ADE																夬
	9AEE	夭	本	夸	夾	奇	奕	奐	奎	奚	奘	奢	奠	奥	奬	奩	
女	9B3F		奸	妁	妝	佞	佞	妣	妲	姆	姨	姜	妍	姪	姚	娥	娟
	9B4F	娑	娜	娉	娚	婀	娙	婉	娵	娶	婢	婪	媚	媼	媾	嫋	嫂
	9B5F	媽	嫣	嫗	嫦	嫩	嫖	嫺	嫻	嬌	嬋	嬖	嬲	嬾	嬪	嬶	嬾
	9B6F	孃	孅	孀													

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
子	9B6F				孑	孕	孚	孛	孥	孩	孰	孳	孵	學	孝	孺	
宀	9B6F																宀
	9B80	它	宦	宸	寃	寇	寉	寔	寐	寤	實	寢	寞	寥	寫	寰	寶
	9B90	寳															
寸	9B90		尅	將	專	對											
小	9B90						尒	尠									
尤	9B90								尢	尷							
尸	9B90										尸	尹	屁	屆	屎	屓	
	9B9E		屐	屏	屍	屬											
屮	9B9E						屮										
山	9B9E							屺	岁	屹	岌	岑	岔	妛	岫	岼	岶
	9BAE	岾	岨	岼	岵	峇	峙	峩	峡	峺	峭	嶌	峪	崋	崕	崗	嵂
	9BBE	崟	崛	崑	崔	崢	崚	崙	崘	嵌	嵒	嵎	嵋	嵬	嵳	嵷	嶇
	9BCE	嶄	嶂	嶢	嶝	嶬	嶮	嶽	嶾	嶷	嶼	嶲	巍	巔	巒	巖	
巛	9BCE																巛
工	9BDE	巫															
已	9BDE		已	巵													
巾	9BDE				帋	帚	帙	帑	帛	帶	帷	幄	幃	幀	幎	幗	幔
	9BEE	幟	幢	幣	幇												
干	9BEE					幵	并										
幺	9BEE							幺	麼								
广	9BEE									广	庠	廁	廂	廈	廏	廖	
	9C3F		廖	廣	廝	廚	廬	廢	廡	廨	廩	廬	廱	廳	廱		
廴	9C3F															廴	廸
廾	9C4F	廾	弃	弉	彝	彜											
弋	9C4F						弋	弍									
弓	9C4F								弓	弩	弭	弸	弼	彈	彌	彎	弯
彑	9C5F	彑	彖	彗	彙												
彡	9C5F					彡	彭										
彳	9C5F								彷	徃	徂	彿	徊	很	徑	徇	從
	9C6F	徙	徘	徠	徨	徭	徼										
心	9C6F							忖	忻	忤	忸	忱	忝	悳	忿	怡	恠
	9C80	怙	怮	怩	怎	怱	怛	怕	怫	怦	怏	怺	恚	恁	恪	恣	恮
	9C90	恊	恆	恍	恣	恃	恤	恂	恬	恫	恙	悁	悍	惧	悃	悚	

DRAFT

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
心	9C9E		悄	悛	悖	悗	悃	悒	悋	悪	悸	悳	悵	悴	悻	悽	惆
	9CAE	悵	惘	慍	愕	愆	惶	惴	愀	愎	惺	愃	愡	惻	惱	愍	愎
	9CBE	慇	愾	慤	愧	慊	愿	愼	慫	愴	慱	慝	慄	慳	慷	慘	慙
	9CCE	慚	慫	慴	愒	慥	慱	慟	慝	慄	慵	慠	慇	慼	慼	慱	憚
	9CDE	憊	憑	憫	憮	懌	懊	應	懷	懈	懃	懆	憺	懋	罹	懍	懦
	9CEE	懣	懶	懺	懴	懿	懽	懼	攝	戀							
戈	9CEE										戈	戉	戍	戍	戛	戛	戛
	9D3F		戞	戡	截	戮	戰	戲	戳								
戸	9D3F									扁							
手	9D3F										扎	扞	扣	扛	扠	扨	扼
	9D4F	抂	抉	找	抒	抓	抖	拔	抃	抔	拗	拑	抻	拏	拿	拆	擔
	9D5F	拈	拜	拌	拊	拂	拇	抛	拉	挌	拮	拱	挧	挂	挈	拯	拵
	9D6F	捐	挾	捍	搜	捏	掖	掎	掀	掫	捶	掣	掏	掉	掟	掄	捫
	9D80	捩	掾	揩	揀	揆	揣	揉	插	揶	揄	搖	搴	搆	搓	搦	搶
	9D90	攝	搗	搦	搏	搉	摯	摶	摎	攪	撕	撓	撥	撩	撈	撼	
	9D9E		據	擒	擅	擇	撻	擘	擂	攔	擧	擧	擠	擡	抬	擣	擯
	9DAE	攬	擶	擴	擲	擺	攀	攙	攘	攜	攅	攤	攣	攫			
攴	9DAE														攴	攵	攸
	9DBE	收	攸	畋	效	敖	敕	敍	敘	敞	敝	敲	數	斂	斃	變	
斗	9DBE																斛
	9DCE	斟															
斤	9DCE		斫	斷													
方	9DCE				旆	旆	旁	旄	旌	旒	旛	旙					
无	9DCE												无	旡			
日	9DCE														旱	杲	旻
	9DDE	昃	昊	杳	昵	昶	昴	昜	晏	晄	晉	晁	晞	晝	晤	晧	晨
	9DEE	晟	晢	晰	暈	暌	暉	暄	暘	暝	暨	暹	曉	曖	曙		
	9E3F		曄	暸	曖	曚	曠	昿	曦	曩							
曰	9E3F										曰	曳	曷				
月	9E3F													朏	朖	朞	朦
	9E4F	朧	霸														
木	9E4F			朮	朿	朵	杁	杣	杤	杆	杞	杠	杙	杣	杤	枉	杰
	9E5F	枩	杼	杪	枌	枋	枦	枡	枡	枷	柯	枴	柬	枳	柩	枸	柤
	9E6F	柞	柝	柢	柮	枹	柮	柆	柧	檜	栞	框	栩	桀	桍	栲	桎

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
木	9E80	梳	栫	桙	档	桷	桿	梟	梏	梭	梔	條	梛	梃	檮	栃	桴
	9E90	梵	梧	梓	桓	桧	桾	椁	棊	椥	棘	椢	梫	棡	椌	椌	棍	
	9E9E		棔	桟	棕	椶	椒	椄	棗	棣	椥	棹	棠	棯	椏	椪	椚
	9EAE	椀	梹	棆	楹	楷	椥	楸	楫	楔	楾	楮	椹	楴	椽	楙	椰
	9EBE	楡	楞	棟	椓	楪	榲	榮	槐	榿	槁	槓	榠	槎	寨	槊	楊
	9ECE	楊	槃	榠	槀	槫	榠	榜	榕	榴	槞	榔	樂	樛	槿	權	槨
	9EDE	槲	槧	樅	榱	樞	槭	樔	槫	樊	樒	櫁	槾	樓	橄	樌	橲
	9EEE	橦	橸	橇	橢	橙	橦	橈	樸	檎	檐	橲	檠	檄	檢	檣	
	9F3F		檗	蘗	檻	櫃	櫂	檸	檳	檬	櫺	櫑	櫟	櫟	櫚	櫪	櫻
	9F4F	欅	蘖	櫺	欒	欖	鬱	欟									
欠	9F4F								欸	欷	盜	欹	飮	歇	歃	歉	歐
	9F5F	欵	歔	欲	歟	歡											
止	9F5F						歸										
歹	9F5F							歹	歿	殀	殄	殃	殍	殘	殕	殞	殤
	9F6F	殪	殫	殯	殲	殱											
殳	9F6F						殳	殷	殼	毆							
毋	9F6F										毋	毓					
毛	9F6F												毟	毬	毫	毳	毯
	9F80	麾	氈														
氏	9F80			氓													
气	9F80				气	氛	氤	氣									
水	9F80								汞	汕	汢	汪	沂	沍	沚	沁	沛
	9F90	汾	汨	汳	沒	沐	泄	泱	泓	沽	泗	泅	泝	沮	沱	沾	
	9F9E		泔	泛	泯	泙	泪	洟	衍	洶	洫	洽	洸	洙	洵	洳	洒
	9FAE	洌	浣	涓	浤	浚	浹	浙	涎	涕	濤	涅	淹	渕	渊	涵	淇
	9FBE	淦	涸	淆	淬	淞	淌	淨	淒	淅	淺	淙	淤	淦	淪	淮	渭
	9FCE	湮	湍	渙	湲	湟	渾	渣	湫	湛	渌	湍	渟	湃	渺	湎	渤
	9FDE	滿	滷	游	滌	溪	溘	滉	溷	滓	溽	溯	滄	溲	滔	滕	溏
	9FEE	溥	滂	溟	潁	漑	灌	滬	滸	滾	漿	滲	漱	滯	漲	滌	
	E03F		漾	漓	滷	澆	潺	潸	澁	澀	潯	潛	濳	潭	澩	潼	潘
	E04F	澎	澑	濂	潦	澳	濬	澡	澤	澹	濆	澪	濟	濕	濬	濔	濘
	E05F	濱	濮	濛	瀉	瀋	濺	瀑	瀁	瀏	濾	瀛	瀚	瀦	瀝	瀘	瀟
	E06F	瀰	瀾	瀲	灑	灣											
火	E06F						炙	炒	炯	烟	炬	炸	炳	炮	烟	烋	烝

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
火	E080	烙	焉	烽	焜	焙	煥	煕	熙	煦	煢	煌	煖	煬	熏	燻	熄
	E090	熕	熨	熬	燗	熹	熾	燒	燉	燔	燎	燠	燬	燧	燵	燼	
	E09E		燹	燿	爍	爐	爛	爨									
爪	E09E								爭	爬	爰	爲					
爻	E09E												爻	爼			
爿	E09E														爿	牀	牆
	E0AE	牋	牘														
牛	E0AE				牴	牾	犂	犁	犇	犒	犖	犢	犠				
犬	E0AE												犹	狄	狃	狆	狄
	E0BE	狎	狒	狢	狠	狡	狹	狷	倏	猗	猊	猜	猖	猝	猴	猯	猩
	E0CE	猥	猾	獎	獏	默	獗	獪	獨	獰	獣	獵	獻	獺			
王	E0CE														珈	珙	珖
	E0DE	玻	珀	珥	珮	珞	珊	琅	琊	琥	琶	琲	琺	瑕	琿	瑟	瑙
	E0EE	瑁	瑜	瑩	瑰	瑣	瑪	瑶	瑾	璋	璞	璧	瓊	瓏	瓔	珱	
瓜	E13F		瓠	瓣													
瓦	E13F				瓩	瓧	瓮	瓲	瓰	甌	甎	瓷	甄	甖	甕	甌	甎
	E14F	甍	甕	甓													
甘	E14F				甞												
生	E14F					甦											
用	E14F						甬										
田	E14F							甲	甶	畋	畊	畉	畛	畝	畚	畎	畤
	E15F	畧	畫	畭	畸	當	疆	疇	畴	疊	疂	疂					
疒	E15F												疔	疚	疝	疥	疣
	E16F	痂	疳	痃	疵	疽	疸	疼	疱	痍	痊	痒	痙	痣	痞	痾	痿
	E180	痼	痺	痰	痺	痲	痳	瘋	瘍	瘉	瘟	瘧	瘠	瘡	瘢	瘤	瘴
	E190	瘰	瘻	癇	癈	癆	癇	癘	癡	癢	癨	癩	癪	癰	癬	癘	
	E19E		癪														
癶	E19E			癶	癸	發											
白	E19E						皂	皃	皈	皐	皎	皖	皓	皙	皚		
皮	E19E															皰	皺
	E1AE	皹	皹	皺													
皿	E1AE				盂	盍	盖	盒	盞	盡	盥	盧	盪	蘯			
目	E1AE														盼	盱	盻
	E1BE	眄	眩	眤	眞	眥	眦	眛	眷	眸	睇	睚	睨	睫	睛	睥	睿

DRAFT

	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
目	E1CE	睾	睹	瞎	瞋	瞑	瞠	瞞	瞰	瞶	瞹	瞿	瞼	矇	矚	矯	矍
	E1DE	矗	矚														
矛	E1DE			矜													
矢	E1DE				矣	矮											
石	E1DE						砿	砌	砒	礦	砠	礪	硅	碎	硼	碵	硼
	E1EE	碚	碌	碣	碵	碪	磑	磴	磆	磋	磔	碾	碼	磅	磊	磬	
	E23F		磧	磚	磽	磴	礫	礒	礑	礙	礬	礫					
示	E23F												祀	祠	祇	祟	祚
	E24F	祕	祓	祺	祿	禊	禍	禧	齋	禪	禮	禳					
禺	E24F												禹	禺			
禾	E24F														秉	秕	秧
	E25F	秬	秡	秣	稈	稍	稘	稙	稠	稟	禀	稱	稻	稾	稷	稼	穂
	E26F	穉	穡	穢	穩	龝	穣										
穴	E26F							窮	穿	窃	窗	窕	窘	窖	窩	竈	窯
	E280	窶	窺	竄	窿	邃	竇	竊									
立	E280								竗	竚	竗	竰	站	竧	竝	竡	竢
	E290	竦	竭	竰													
竹	E290				笂	笏	笊	笆	笳	笘	笙	笞	笵	笨	笶	筐	
	E29E		筺	笄	筍	箏	筌	筽	筵	箕	筴	箆	箙	篋	篌	篏	箴
	E2AE	箘	箙	箍	箜	箚	箋	篝	箏	箏	篳	篦	篁	篌	篏	箴	篆
	E2BE	篝	篩	簔	簔	篦	篥	籠	簀	簇	簀	篳	篷	篥	篭	篤	篳
	E2CE	簧	簪	簟	簷	簫	簽	籌	籃	籔	簇	籀	籐	籐	籟	籤	籤
	E2DE	籥	籬														
米	E2DE			粁	粗	粕	粤	粭	粂	粨	粡	粨	粳	粲	粱	粮	粹
	E2EE	粽	糀	糅	糘	糘	糯	糜	糢	糲	糯	糲	糶	糶			
糸	E2EE														糺	紆	
	E33F		紂	紜	紕	紊	絅	紘	紮	絏	絆	紵	絆	絳	絖	絎	絲
	E34F	絨	絮	絏	絣	經	綉	絛	綏	絽	綛	綺	綮	綣	綵	緇	綽
	E35F	綫	總	綢	綯	緜	綸	綟	綰	緘	緝	緤	緞	緻	緲	緙	緘
	E36F	縊	縣	縡	縒	縋	縟	縉	縋	縢	繆	繩	縻	縵	縹	繃	縷
	E380	繆	繻	繧	繝	繖	繞	繙	繚	繹	繪	繩	繼	繻	繿	繻	繽
	E390	辮	繿	纈	纉	續	纒	纈	纓	纔	纖	纎	纛	纜			
缶	E390														缸	缺	
	E39E		罅	罌	罍	罐	罐										

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
网	E39E							网	罕	罔	罘	罟	罠	罼	罩	罸	罰
	E3AE	羂	羆	羃	羈	羇											
羊	E3AE						羌	羔	羞	羝	羚	羣	羯	羲	羹	羹	羶
	E3BE	羸	譱														
羽	E3BE			翅	翠	翊	翕	翔	翡	翦	翩	翳	翹	飜			
老	E3BE														耆	耄	耋
耒	E3CE	耒	耘	耙	耜	耡	耨										
耳	E3CE							耻	耻	聊	聆	聒	聘	聚	聟	聢	聯
	E3DE	聳	聲	聰	聶	聹	聽										
聿	E3DE							聿	肄	肆	肅						
肉	E3DE											肛	肓	肚	肭	冐	肬
	E3EE	胛	胥	胙	胝	胄	胚	胖	脉	胯	胱	脛	脩	脣	脯	脹	
	E43F		隋	腆	脾	腓	腑	胼	腱	腮	腥	腦	腴	膃	膈	膊	膀
	E44F	膂	膠	膕	膤	膣	腟	膓	膩	膰	膵	膾	膸	膽	臀	臂	膺
	E45F	臉	臍	臑	臙	臘	臈	臚	臟	臠							
臣	E45F										臧						
至	E45F											臺	臻				
臼	E45F													與	舁	舂	舅
	E46F	與	舊														
舌	E46F			舎	舐	舗											
舟	E46F						舩	舫	舸	舳	艀	艙	艘	艝	艚	艟	艤
	E480	艨	艩	艪	艫	艮											
艮	E480						艱										
色	E480							艶									
艸	E480								艸	艾	芍	芒	芫	芟	芻	芬	苡
	E490	苣	苟	苒	苴	苳	苺	莓	范	苻	苹	苞	茆	苔	茉	苣	
	E49E		茵	茴	茖	茲	茱	萄	茹	荐	荅	茯	茫	茗	荔	莅	莚
	E4AE	莪	莟	莢	莖	莫	莎	莇	莊	荼	莵	荳	荵	荸	莉	莨	菴
	E4BE	萓	菫	菎	萩	萃	萩	萋	菁	蒂	蓁	蒲	菲	萍	菟	萠	莽
	E4CE	萸	蔆	葒	葭	葎	葤	葬	葸	葷	葫	蒡	葭	蒂	葩	葆	萬
	E4DE	葯	葹	萵	蓊	葢	蒹	蒿	蒟	蓙	蓍	蓊	蒨	蓼	蓁	蓆	蓖
	E4EE	蓺	蔡	蓿	蓴	蔗	蔘	蔬	蔟	蔕	蔔	蔘	蔭	葬	蓼	蓱	
	E53F		蕁	蘂	蓋	蕕	蘊	薙	薈	薑	薊	薨	蕭	薔	薛	藪	薇
	E54F	薜	蘋	蕾	蕘	藉	薺	藏	薹	藐	藕	藝	藥	藜	藹	蘊	蘓

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
艸	E55F	蘋	藾	藺	蘆	蘢	蘇	蘰	蘿								
虍	E55F									虎	虏	虔	號	虧			
虫	E55F														虱	蚓	蚣
	E56F	蚩	蚪	蚋	蚌	蚶	蚯	蛄	蛆	蛐	蛉	蠣	蛹	蛔	蛞	蛩	蛬
	E580	蛟	蛛	蛯	蛭	蜆	蜈	蜀	蜃	蜕	蜑	蜉	蜍	蛹	蜊	蜴	蜿
	E590	蜷	蜻	蜥	蜩	蜚	蝠	蝟	蝸	蝌	蝎	蝴	蝗	蝨	蝮	蝙	
	E59E		蝓	蝣	蝪	蠅	螢	螟	螂	螯	蟋	蟲	蟀	蟐	雖	螫	蟄
	E5AE	螳	蟇	蟆	螻	蟯	蟲	蟠	蠏	蠍	蟾	蟶	蟷	蠑	蠖	蠍	蠖
	E5BE	蠕	蠢	蠡	蠱	蠶	蠹	蠧	蠻								
血	E5BE									衄	衂						
行	E5BE											衒	衙	衛	衢		
衣	E5BE															衫	袁
	E5CE	衾	衰	衵	衽	衿	袋	袂	袗	袒	袮	袖	袢	袍	袤	袈	袿
	E5DE	袱	袴	袵	裔	裘	裙	裝	裹	褂	褐	裴	裨	裲	褄	褌	褊
	E5EE	褓	褒	褫	褥	褪	褶	褸	襄	褻	褶	褄	禪	禪	襠	襞	
	E63F		襦	襤	襪	襴	襷	襾	覆								
襾	E63F									襾	覃	覈	覊				
見	E63F													覓	覗	覡	覦
	E64F	覦	覬	覲	覿	覺	覽	覿	觀								
角	E64F									觚	觜	觝	觧	觴	觸		
言	E64F															訃	訖
	E65F	訐	訌	訛	訝	訥	訶	詁	詛	詒	詆	詈	詼	詭	詬	詢	詆
	E66F	誂	誄	誨	誡	誑	誥	誦	誚	誣	諄	諍	諂	諚	諫	諳	諧
	E680	諤	諱	謔	諠	諢	諷	諞	諛	謌	謇	謚	諡	謖	謗	謠	
	E690	謳	鞫	謦	謫	謾	謨	譁	譌	譏	譎	證	譖	譖	譚	譫	
	E69E		譟	譬	譯	譴	譽	讀	讌	讎	讒	讓	讖	讙	讚		
谷	E69E															豺	豁
	E6AE	谿															
豆	E6AE		豈	豌	豎	豐											
豕	E6AE						豕	豢	豬								
豸	E6AE									豸	豺	貂	貉	貊	貍	貔	
	E6BE	貘	貔	貘													
貝	E6BE				賊	賃	貪	貽	貲	貳	貳	貶	賈	賁	賤	賣	賚
	E6CE	賽	賺	賻	贄	贅	贊	贇	贏	贍	贖	贐	贓	賍	贔	贖	

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
赤	E6CE																赧
	E6DE	赭															
走	E6DE			赱	赳	趁	趁										
足	E6DE						跂	趾	趺	跏	跚	跖	跌	跛	跋	跪	跫
	E6EE	跟	跣	跼	跾	踉	跿	踝	踞	踐	踟	踉	踵	踰	踴	蹊	
	E73F		踏	踓	踔	踖	蹈	蹙	蹤	蹠	蹤	蹣	蹕	蹶	蹲	蹼	躁
	E74F	躇	躅	躄	躋	躊	躓	躑	躔	躙	躪	躡					
身	E74F												躬	躰	體	躱	躾
	E75F	軀	軈														
車	E75F			軋	軛	軦	軼	軻	軫	軾	軽	軺	軽	軏	轍	軼	軛
	E76F	較	輌	輌	輦	輳	輻	輹	轅	轂	轇	轌	轉	轆	轎	轗	轜
	E780	轢	轣	轤													
辛	E780				辜	辟	辣	辭	辯								
辶	E780									辶	迚	迴	迢	迪	迯	邇	迴
	E790	逅	迹	迺	逑	逕	逡	逍	逞	逖	逋	逎	逶	逵	達	逝	
	E79E		遏	遐	遑	遒	逎	遉	逾	遖	遘	遞	遨	遯	遶	隨	遲
	E7AE	邂	遽	邁	邀	邊	邉	邏									
邑	E7AE								邨	邯	邱	邵	郢	郤	扈	郛	鄂
	E7BE	鄒	鄙	鄢	鄰												
酉	E7BE					酊	酖	酘	酣	酥	酩	酳	酲	醋	醉	醂	醢
	E7CE	醫	醴	醪	醸	醴	醺	釀	釁								
采	E7CE									釉	釋						
里	E7CE											釐					
金	E7CE												釦	釁	釜	釗	釼
	E7DE	釵	釶	鈎	釿	鈔	鈬	鈕	鈑	鉞	鉗	鉅	鉉	鉤	鉈	鉾	鉇
	E7EE	鉋	鉐	鉤	鉄	鉚	鉐	鉚	鉄	錆	銷	錙	錻	鋺	鋲	鋼	
	E83F		錙	錢	錚	錣	錻	錵	錻	鍜	鍠	鍼	鍮	鍖	鎰	鎬	鎮
	E84F	鎔	鎹	鏖	鏗	鏨	鏥	鏘	鏃	鏝	鏐	鏈	鏤	鐚	鐔	鐓	鐃
	E85F	鐔	鐐	鐶	鐫	鐵	鐵	鐺	鑁	鑒	鑄	鑛	鑠	鑢	鑞	鑪	鈩
	E86F	鑰	鑵	鑷	鑚	鑚	鑼	鑾	钁	鑿							
門	E86F										閂	閇	問	閔	閖	閘	閙
	E880	閏	閨	閧	閭	閖	閻	閹	閾	闊	濶	闃	闍	闌	闕	闔	闖
	E890	關	闡	闥	闢												
阜	E890					阡	阨	阮	阯	陂	陌	陏	陋	陷	陜	陞	

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
阜	E89E		陝	陟	陶	陲	陬	隍	隘	隕	隗	險	隧	隱	隹	隰	隴
隶	E8AE	隶	隷														
隹	E8AE			隹	雎	雋	雉	雍	襍	雜	霍	雕					
雨	E8AE												雹	霄	霆	霈	霓
	E8BE	雰	雷	雳	雾	霎	霤	霪	霰	霹	霽	霾	靄	靆	靈	靂	靉
青	E8CE	靜															
非	E8CE		靠														
面	E8CE			靤	靦	靨											
革	E8CE						勒	靫	靭	靹	鞅	靼	鞁	靺	鞆	鞋	鞏
	E8DE	靴	鞜	鞨	鞦	鞣	鞳	鞴	韃	韈	韋						
韋	E8DE											韋	韜				
韭	E8DE													韭	韲	韮	
音	E8DE																竟
	E8EE	韶	韵														
頁	E8EE			頇	頌	頸	頤	頡	頷	頽	顆	顏	顋	顫	顯	顰	
	E93F		顱	顴	顳												
風	E93F					颪	颯	颱	颶	飄	飃	飆					
食	E93F												飩	飫	飭	飴	飼
	E94F	餔	餘	餡	餉	餞	餤	餅	餬	餮	餽	餾	饂	饉	饅	饐	饋
	E95F	饑	饒	饌	饕												
首	E95F					馗	馘										
香	E95F							馥									
馬	E95F								馭	馮	馼	駟	駛	駝	駘	駑	駭
	E96F	駮	駱	駲	駸	駿	騁	騏	騅	騒	騙	騫	騒	驅	驂	驀	驃
	E980	驟	驕	驍	驛	驗	驟	驢	驤	驤	驩	驫	驪				
骨	E980													骭	骰	骼	髀
	E990	髏	髑	髓	體												
高	E990					髞											
髟	E990						髟	髫	髣	髴	髷	髻	髮	鬆	鬘	鬚	
	E99E		髯	鬆	鬟	鬣	鬢	鬮	鬻								
鬥	E99E									鬥	鬧	鬨	鬩	鬪	鬮		
鬯	E99E															鬯	
鬲	E99E																鬲
鬼	E9AE	魄	魅	魏	魍	魎	魑	魘									

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	Shift JIS	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
魚	E9AE								魴	鮓	鮃	鮑	鮖	鮟	鮱	鮫	鮭
	E9BE	鮴	鮹	鯊	鯏	鯑	鯒	鯓	鯔	鯣	鯢	鯤	鯰	鯡	鯵	鯲	鯱
	E9CE	鯷	鰀	鰔	鰉	鰓	鰌	鰆	鰈	鰒	鰕	鰔	鰛	鰮	鰯	鰰	鰹
	E9DE	鰺	鰻	鰲	鰾	鱈	鱚	鱠	鱧	鱶	鱸						
鳥	E9DE											鳧	鳬	鳰	鳩	鳳	鳫
	E9EE	鳶	鳶	鳰	鳶	鶯	鴪	鴟	鵄	鵞	鴇	鴟	鴿	鵜	鵝	鵡	
	EA3F		鵝	鵞	鵙	鵑	鵐	鵙	鵲	鶉	鶇	鶫	鶚	鶺	鶯	鶲	鶴
	EA4F	鶲	鶏	鷁	鶻	鶸	鶺	鷁	鷆	鷂	鷙	鷓	鷏	鷦	鷭	鷯	鷲
	EA5F	鸚	鸛	鸞													
鹵	EA5F				鹵	鹹	鹽										
鹿	EA5F							麁	塵	麋	麕	麒	麕	麗	麝		
麥	EA5F															麥	麩
	EA6F	麸	麺	麭													
麻	EA6F				靡												
黄	EA6F					黌											
黍	EA6F						黎	黏	黝								
黒	EA6F									黔	黜	點	黝	黠	黥	黨	黯
	EA80	黴	黶	黷													
黹	EA80				黹	黻	黼										
黽	EA80							黽	鼇	鼈							
皷	EA80										皷	鼕					
鼠	EA80												鼬	鼬			
鼻	EA80														鼾		
齊	EA80															齊	
齒	EA80																齒
	EA90	齔	齣	齟	齠	齢	齦	齧	齬	齪	齷	齲	齶				
龍	EA90													龕			
龜	EA90														龜		
龠	EA90															龠	

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10.10 2D code

Maxi Code (Compatible Commands)

ESC+BV

Hexadecimal code	ESC	BV	Parameter
	$<1B>_{16}$	$<42>_{16}<56>_{16}$	a,b,c,ddddddddd,eee,fff,n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify the MaxiCode.

[Format]

<BV>a,b,c,ddddddddd,eee,fff,n～n

●Parameter

a[Symbol number] = Range : 1~8
b[Symbol digit] = Range : 1~8
c[Mode] = 2 : For carrier
3 : For carrier
4 : Standard code
6 : For reading device
d [Postal code] = Valid range : 0~999999999 (mode 2)
000000~999999(mode 3)
* Maximum 9 digits for mode 2(only numeric)
Fixed to 6 digits for mode 3 (upper case only for alphabet)
e[Country code] = Valid range : 001~999
f [Service class] = Valid range : 001~999
n[Low priority message] = Alphanumeric, symbols

Mode	Service class	Country code	Postal code	The maximum number of print data	
				Numeric only	Alphanumeric
2	Fixed to 3 digits (Numeric only)	Fixed to 3 digits (Numeric only)	Maximum 9 digits	123	84
3			Fixed to 6 digits (alphanumeric)		
4	Omission			138	93
6					

[Coding Example]

<A>
<V>100<H>200**<BV>1,1,2,123456789,001,002,SAHTHA**
<Q>2
<Z>

[Notes]

1. The size of the MaxiCode does not vary depending on the number of print data.
2. The code will not be printed when a parameter other than above is specified or number of print data does not match.
3. Specify more than 12 for the print data when mode 4 or 6 is specified. The MaxiCode that print data are equal or less than 11 cannot be read by scanners.

[Important]

This command is for exsiting models.Using Maxi Code command <2D20> is recommended

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MaxiCode-Code Table

					S				I				S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[01H to FFH] are available in MaxiCode.

DRAFT

10.11 2D code

PDF417 (Compatible Commands)

ESC+BK

Hexadecimal code	ESC	BK	Parameter
	$<1B>_{16}$	$<42>_{16}<4B>_{16}$	aabbcddeeffffg～g(,h)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify the PDF417.

[Format]

<BK>aabbcddeeffffg～g(,h)

●Parameter

a[Minimum module width] = Valid range : 01~27 (dots)
b[Minimum module height] = Valid range : 01~72 (dots)
c[Security level] = Valid range : 0~8
c[Number of data codewords per 1 line](Cols) = Valid range : 01~30
00:Auto(the width size varies depending on the specified number of data)
e[Lines per symbol] = Valid range : 03~90
00:Auto (the height size varies depending on the specified number of data)
f[Number of data digit] = Valid range : 0001~2681
g[Print data] = data
h[PDF code type] = when omitted: PDF417
T :Truncated
M :MicroPDF

[Coding Example] Minimum module width: 03(dots), minimum module height: 09(dots)
Security level: 3, number of data codewords per 1 line: 03, lines per symbol: 18

<A>
<V>100<H>200**<BK>03093031800010PDF1234567**
<Q>2
<Z>

[Notes]

1. It is possible to specify 01 or 02 dots as the minimum module width, however, the code may not be read by a scanner.
2. It is possible to specify 01, 02 or 03 dots as the minimum module height, however, the code may not be read by a scanner.
3. The ratio of vertical and horizontal size(aspect ratio) is 1:2 according to the number of print data when the number of data codewords per 1 line and lines per symbol are specified as 00.
4. It is necessary to specify bigger lines per symbol or number of data codewords per 1 line when bigger security level is specified.
5. The maximum value for the number of data digit is 2681, however, this varies depending on the minimum module size, security level, and type of the print data.
6. The code will not be printed when a parameter specification or number of print data does not match.
7. When MicroPDF is specified in the PDF code type, the lines per symbol is decided according to the number of data codewords per 1 line. And the maximum value of the number of data digit will be decided, too. Refer to the "Symbol size and number of data for MicroPDF417" in the next page.
8. The security level is disabled when MicroPDF is specified in the PDF code type.

[Important]

This command is for exsiting models.Using PDF417 command <2D10> and Micr PDF417command <2D12> is recommended

[Remarks]

1. The sequential numbering is invalid.
2. Print position specification by auto line feed is not available.
3. Print specification to 00H~FFH is available.
4. Format registration is available.
5. Specify bigger minimum module size when improving the print quality.
6. Specify a bigger security level value when improving the scanner readability.
7. The height of the code varies when the data are only alphabet or only numeric, and when the data are alphanumeric.

* The symbol size of MicroPDF417 is fixed to the following 34 types.

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"Symbol size and number of data for MicroPDF417"

Symbol size		The maximum number of data		
Cols(c)	Rows(d)	Only alphabet(A~Z)	Numeric only	Binary mode
1	11	6	8	3
	14	12	17	7
	17	18	26	10
	20	22	32	13
	24	30	44	18
	28	38	55	22
2	8	14	20	8
	11	24	35	14
	14	36	52	21
	17	46	67	27
	20	56	82	33
	23	64	93	38
	26	72	105	43
3	6	10	14	6
	8	18	26	10
	10	26	38	15
	12	34	49	20
	15	46	67	27
	20	66	96	39
	26	90	132	54
	32	114	167	68
	38	138	202	82
	44	162	237	97
4	4	14	20	8
	6	22	32	13
	8	34	49	20
	10	46	67	27
	12	58	85	34
	15	76	111	45
	20	106	155	63
	26	142	208	85
	32	178	261	106
	38	214	313	128
	44	250	366	150

* Alphabet(upper case, lower case), numeric and mix of the control code varies depending on the combined number of characters.

DRAFT

PDF417-Code Table

					S								I				S				O			
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			"	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			'	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[00H to FFH] are available in PDF417.

DRAFT

10.12 2D code

DataMatrix (ECC200) (Compatible Commands)

ESC+BX

Hexadecimal code	ESC	BX	Parameter
	$<1B>_{16}$	$<42>_{16}<58>_{16}$	aabbccddeeefffghh
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify DataMatrix(ECC200).

[Format](setting part)

<BX>aabbccddeeefffghh

●Parameter

a[Format ID]	=	Valid range	:	01(Fixed)
b[Error correction level(error correction)]	=	Valid range	:	20(Fixed)
c[Width of cell]	=	Valid range	:	01～99(dot/cell)
d[Pitch of cell]	=	Valid range	:	01～99(dot/cell)
e[Number of cell in per 1 line]	=	Valid range	:	010～144
		000	:	Auto setting
f [Number of cell lines]	=	Valid range	:	008～144
		000	:	Auto setting
g[Mirror image]	=	Valid range	:	0(Fixed)
h[Size of the guide cell]	=	Valid range	:	01(Fixed)

[Notes]

1. It is possible to specify 01 and 02 for the width of the cell and pitch of the cell, however, the code may not be read by a scanner. The error occurs with 00.
2. The optimal matrix size will be set automatically when 000 is specified for both numbers of cells per 1 line and number of cell lines.

[Important]

This command is for exsiting models.Using DataMatrix(ECC200) command <2D50> is recommended

DRAFT

10.13 2D code

DataMatrix (ECC200) Data (Compatible Commands)

ESC+DC

Hexadecimal code	ESC	DC	Parameter
	$<1B>_{16}$	$<44>_{16}<43>_{16}$	n～n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify the data of DataMatrix (ECC200).

[Format](data specification part)
<DC>n～n

●Parameter
n [Print data] = data

[Coding Example] Width of cell: 02, Pitch of cell: 02,
number of cell per 1 line: 000, number of cell line: 000
Print data: 1234567890

<A>
<V>100<H>200
<BX>01200202000000001
<DC>1234567890
<Q>2
<Z>

[Note]
"00H to FFH" are available in DataMatrix (ECC200). However, it is not possible to specify 05H, 10H, 11H, 18H, and 1BH because these are printer control codes. Specify DataMatrix <2D50> when specifying control codes in the data.

[Important]
This command is for exsiting models.Using DataMatrix(ECC200) command <2D50> is recommended

Data format	Number of data
Numeric	3116
Alphanumeric	2335
Binary(00H~FFH)	1556

* The values above are the maximum number of data available as the barcode data.

DRAFT

10.14 2D code

DataMatrix (ECC200) Sequential Numbering (Compatible	ESC+FX

Hexadecimal code	ESC	FX	Parameter
	$<1B>_{16}$	$<46>_{16}<58>_{16}$	aaabcccdddeee
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter isnot maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify sequential numbering of DataMatrix (ECC200).

[Format]Sequential numbering
<FX>aaabcccdddeee

●Parameter

a[Number of printing for the same contents]	=	Valid range	:	001~999
b[Increment/Decrement flag]	=	+	:	Increment
		-	:	Decrement
c[Number of increment/decrement]	=	Valid range	:	001~999
d[Digit position specification]	=	Valid range	:	001~999
e[Number of digit]	=	Valid range	:	001~999

[Coding Example] Number of printing for the same contents: 001, Increment/Decrement flag: +,
number of increment/decrement: 001, digit position specification: 005, number of digits: 003

<A>
<V>100<H>200
<FX>001+001005003
<BX>01200202000000001
<DC>00006000
<Q>2
<Z>

[Important]
This command is for exsiting models.Using DataMatrix(ECC200) command <2D50> is recommended

DRAFT

GS1 DataMatrix(ECC200)-Code Table (at <DC> specification)

					S								S							
				B8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
				B7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
				B6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
				B5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
B4	**B3**	**B2**	**B1**		**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
0	0	0	0	**0**			SP	0	@	P	`	p								
0	0	0	1	**1**			!	1	A	Q	a	q								
0	0	1	0	**2**			”	2	B	R	b	r								
0	0	1	1	**3**			#	3	C	S	c	s								
0	1	0	0	**4**			$	4	D	T	d	t								
0	1	0	1	**5**			%	5	E	U	e	u								
0	1	1	0	**6**			&	6	F	V	f	v								
0	1	1	1	**7**			’	7	G	W	g	w								
1	0	0	0	**8**			(	8	H	X	h	x								
1	0	0	1	**9**			)	9	I	Y	i	y								
1	0	1	0	**A**			*	:	J	Z	j	z								
1	0	1	1	**B**			+	;	K	[	k	{								
1	1	0	0	**C**			,	<	L	\	l	|								
1	1	0	1	**D**			-	=	M	]	m	}								
1	1	1	0	**E**			.	>	N	^	n	~								
1	1	1	1	**F**			/	?	O	_	o	DEL								

[00H to FFH] are available in GS1 DataMatrix(ECC200).
(However, it is not possible to specify 05H, 10H, 11H, 18H, and 1BH because these are printer control codes.)
Specify [7EH, 7EH] when printing 7EH.

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11 Graphics command

11.1 Graphic

Print of Graphic	ESC+G

Hexadecimal code	ESC	G	Parameter
	$<1B>_{16}$	$<47>_{16}$	abbbcccn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the print of graphic.

[Format]

<G>abbbcccn~n

●Parameter

a[Data specification by HEX and BIN] H : Hex data
Divide 8 bit data into 4 bits and output it as hex code corresponding to ASCII.
B : Binary data
Output 8 bit data as one font of data all at once.

b[Specification of crosswise graphic area per byte] Refer to the table below

c[Specification of lengthwise graphic area per byte] Refer to the table below

n[Graphic data]

[Coding Example 1] [□] is printed with the below specification when [H: HEX data]

```
<A>
<V>50<H>50
<G>H001001FF818181818181FF
<Q>1
<Z>
```

[Coding Example 2] [□] is printed with the below specification when [B: binary data]

```
<A>
<V>50<H>50
<G>B001001<1FF818181818181FF>16
<Q>1
<Z>
```

[Notes]

1. Specification of [B] has a longer program description than that of specification [H]; however, the transfer data length is 50 percent shorter.
   This could be advantages in data capacity.
2. Specification of Rotation <%> and Enlargement <L> are enabled.
3. It is necessary to put enlarge command <L> just before the graphic print command <G> for enlargement.
4. Specify in the order of rotation command <%> and enlarge command <L> when specifying both commands.
5. The crosswise maximum byte and lengthwise maximum byte are specified in the table below, however, it is possible to specify up to 999 bytes to have compatibility with the old model.
   It is possible to print less than 2,937,600 bytes as the graphic data.
6. The calculation of graphic data size is [crosswise maximum byte x lengthwise maximum byte x 8].

[Parameter Initial Value and Specified Range]

[S84-ex]

Head density	Crosswise max. bytes	Lengthwise max. bytes
8dots/mm (203 dpi)	104	400
12dots/mm (305 dpi)	156	600
24dots/mm (609 dpi)	312	999

[S86-ex]

Head density	Crosswise max. bytes	Lengthwise max. bytes
8dots/mm (203 dpi)	168	400
12dots/mm (305 dpi)	252	600

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11.2 Graphic

Print of BMP File

ESC+GM

Hexadecimal code	ESC	GM	Parameter
	$<1B>_{16}$	$<47>_{16}<4D>_{16}$	aaaaa,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify printing of BMP format image data.

[Format]

<GM>aaaaa,n~n

●Parameter

a[Total bytes of BMP file]

n[Data]

[Coding Example]

<A>

<V>50<H>50**<GM>04500,2000288888888…8888**

<Q>2

<Z>

[Notes]

1. Data is sent in binary data (Outputs 8-bit data as 1 font data all at once). (The file size of BMP file is the total bytes of BMP file, and BMP file data are data)
2. When [Total bytes of BMP file] are not matching the transfer data, this may become the cause of malfunction.
3. Total bytes are the file size displayed at [Property] and such.
4. BMP file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for the BMP compressed file.
   Make sure that the file extension is set to [BMP] before printing.
5. Rotation <%> and Enlargement <L> are enabled.
6. It is necessary to put enlarge command <L> just before the BMP file command <GM> for enlargement.
7. Specify in the order of rotation command <%> and enlarge command <L> when specifying both commands.

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11.3 Graphic

Print of PCX File

ESC+GP

Hexadecimal code	ESC	GP	Parameter
	$<1B>_{16}$	$<47>_{16}<50>_{16}$	aaaaa,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specify PCX file print.

[Format]
<GP>aaaaa,n~n

●Parameter
a[Total bytes of PCX file]
n[Data]

[Coding Example]
<A>
<V>50<H>50**<GP>04500,XXXXXXXXXXXX**
<Q>2
<Z>

[Notes]
1. Data is sent in binary data (Outputs 8-bit data as 1 font data all at once). (The file size of PCX file is the total bytes of PCX file, and PCX file data are data)
2. If [Total bytes of PCX file] are not matching the transfer data, this may become the cause of malfunction.
3. Total bytes are the file size displayed at [Property] and such.
4. PCX file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for the PCX compressed file.
   Make sure that the file extension is set to [PCX] before printing.
5. Rotation <%> and Enlargement <L> are enabled.
6. It is necessary to put enlarge command <L> just before the PCX file command <GP> for enlargement.
7. Specify in the order of rotation command <%> and enlarge command <L> when specifying both commands.

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12 System command

12.1 System

Print Speed	ESC+CS

Hexadecimal code	ESC	CS	Parameter
	<1B>$_{16}$	<43>$_{16}$<53>$_{16}$	aa
Initial value	Refer to the table below.		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]
Specifying the speed of printing.

[Format]
<CS>aa

●Parameter
aa[Print speed] = Refer to the table below

[Coding Example 1] When specifying 6.0 inch/s
<A>
<CS>6
<Z>

[Note]
The print speed value that is set directly by the command or LCD input is maintained.

[Remarks]
1. If the value other than setting range is specified, command error will occur and print speed will not be changed.
2. The initial value is settable by default setting operation of the printer.

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[Parameter Initial Value and Specified Range]

Model	Head density	Initial value [aa]	Parameter valid range	The print speed corresponding to the parameter
S84-ex	8dots/mm (203dpi)	6	4 ~ 16	2 : 2 inch/s (50.8mm/s) 3 : 3 inch/s (76.2mm/s) 4 : 4 inch/s (101.6mm/s) 5 : 5 inch/s (127.0mm/s) 6 : 6 inch/s (152.4mm/s) 7 : 7 inch/s (177.8mm/s) 8 : 8 inch/s (203.2mm/s) 9 : 9 inch/s (228.6mm/s) 10 : 10 inch/s (254.0mm/s) 11 : 11 inch/s (279.4mm/s) 12 : 12 inch/s (304.8mm/s) 13 : 13 inch/s (330.2mm/s) 14 : 14 inch/s (355.6mm/s) 15 : 15 inch/s (381.0mm/s) 16 : 16 inch/s (406.4mm/s)
	12dots/mm (305dpi)	6	4 ~ 14	
	24dots/mm (609dpi)	3	2 ~ 6	
S86-ex	8dots/mm (203dpi)	6	4 ~ 14	
	12dots/mm (305dpi)	6	4 ~ 12	

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12.2 System

Print Darkness

ESC+#F

Hexadecimal code	ESC	#F	Parameter
	$<1B>_{16}$	$<23>_{16}<46>_{16}$	1) ab 2) aab
Initial value	Refer to the table below.		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specifying the darkness level of print.

[Format]

<#F>ab

●Parameter

a[Print darkness level] = 1 Lightest
2
3
4
5
6
7
8
9
10 Darkest

b[Print darkness] = A (Omissible)
Use [A] under normal conditions.
Parameter valid range varies depending on the models (Refer to the table below).

[Coding Example]

<A>
<#F>5A
<Z>

[Note]

The print darkness value specified by the command or the LCD is maintained.

[Remarks]

1. If the value other than setting range is specified, command error will occur and print darkness will not be changed.
2. The initial value is settable by default setting operation of the printer.
3. <#E> (the old print darkness command) is ignored and the print darkness is not changed with the command.

[Print Darkness Level Specified Range]

Model	Initial value	Parameter valid range	Other than a valid range
S84-ex Series	6	1,2,3,4,5,6,7,8,9,10	The command error occurs when other than valid range is specified.
S86-ex Series	6	1,2,3,4,5,6,7,8,9,10	

[Print Darkness Specified Range]

Model	Initial value	Parameter valid range	Other than a valid range
S84-ex Series	A	A	The command error occurs when other than valid range is specified.
S86-ex Series	A	A	

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12.3 System

Label Size

ESC+A1

Hexadecimal code	ESC	A1	Parameter
	$<1B>_{16}$	$<41>_{16}<31>_{16}$	aaaabbbb VaaaaaHbbbb
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specifying the size of the label.

[Format]

<A1>aaaabbbb (a, b fixed) [Note] When the height ofthe labell is equal to or less than 9999.
<A1>VaaaaaHbbbb (a, b variable specification enabled)

●Parameter

a[Height of label] = Refer to the table below
b[Width of label] = Refer to the table below

[Specified Range]

[S84-ex]

Head density	Width of label (dots)	Height of label (dots)
8dots/mm (203 dpi)	1 ~ 832	1 ~ 20000
12dots/mm (305 dpi)	1 ~ 1248	1 ~ 18000
24dots/mm (609 dpi)	1 ~ 2496	1 ~ 9600

[S86-ex]

Head density	Width of label (dots)	Height of label (dots)
8dots/mm (203 dpi)	1 ~ 1340	1 ~ 9992
12dots/mm (305 dpi)	1 ~ 2010	1 ~ 14988

[Coding Example 1] Width of label: 800dots Height of label : 640dots

<A>
<A1>08000640
<Z>

[Coding Example 2] Width of label : 800dots Height of label : 640dots

<A>
<A1>V800H640
<Z>

[Coding Example 3] Width of label : 1200dots Height of label : 40dots

<A>
<A1>12000040
<Z>

[Coding Example 4] Width of label : 1200dots Height of label : 40dots

<A>
<A1>V1200H40
<Z>

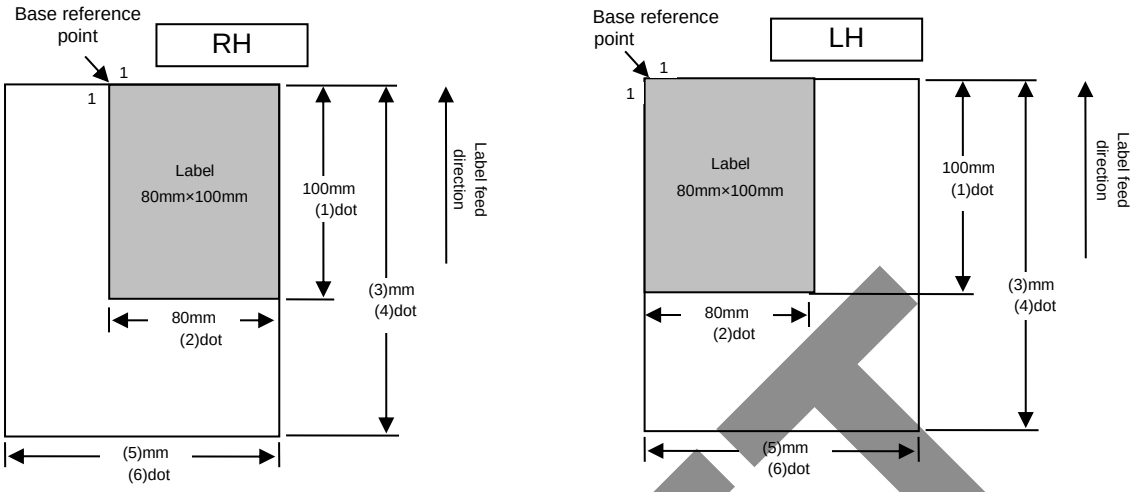
[Coding Example 5] Width of label : 11200dots Height of label : 240dots

<A>
<A1>V11200H240
<Z>

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[Notes]

1. If using the label smaller than the head width, use this command for specifying the label size and adjust the base reference point corresponding to the label size.
2. For specifying the label size, include the size of backing paper.



[S84-ex]

Head density	(1)dot	(2)dot	(3)mm	(4)dot	(5)mm	(6)dot
8dots/mm (203 dpi)	800	640	2500	20000	104	832
12dots/mm (305 dpi)	1200	960	1500	18000	104	1248
24dots/mm (609 dpi)	2400	1920	400	9600	104	2496

[S86-ex]

Head density	(1)dot	(2)dot	(3)mm	(4)dot	(5)mm	(6)dot
8dots/mm (203 dpi)	800	640	1249	9992	167.5	1340
12dots/mm (305 dpi)	1200	960	1249	14988	167.5	2010

DRAFT

12.4 System

Base Offset Setting

ESC+A3

Hexadecimal code	ESC	A3	Parameter
	$<1B>_{16}$	$<41>_{16}<33>_{16}$	VabbbHcddd
Initial value	a=+、b=000、c=+、d=000		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Changes the coordinate of the base point. This is configured in the advanced mode of the printer normally.

[Format]

<A3>VabbbHcddd

●Parameter

a[Vertical offset code] (Omissible) = +, -

b[Vertical offset (in dot)] = Refer to the below table

c[Horizontal offset code] (Omissible) = +, -

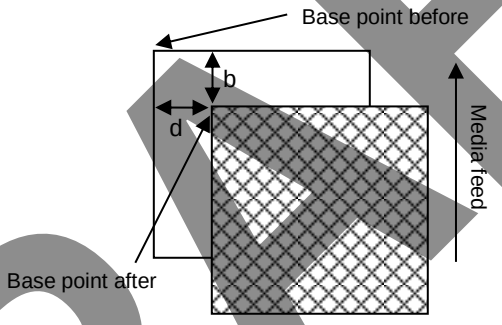
d[Horizontal offset (in dot)] = Refer to the below table

[Coding Example]

<A>

<A3>V10H10

<Z>



[Notes]

1. Note that when the base point is offset and the image is out of the printable area, the image may not be printed.
2. Note that when offset the base point while using multiple label format, all base points of the formats are offset.

[Remarks]

1. When the print offset is already specified in the advanced mode of the printer, and base point offset is specified with the <A3> command, the value specified by the <A3> command become valid.
2. The offset value specified by the <A3> command is registered in the advanced mode of the printer. Thus, the offset value specified by the <A3> command is maintained even the printer power is off.

[Range]

[S84-ex]

Head density	"Horizontal offset (in dot)"	"Vertical offset (in dot)"
8dots/mm (203 dpi)	1 - 832	1 - 1424
12dots/mm (305 dpi)	1 - 1248	1 - 2136
24dots/mm (609 dpi)	1 - 2496	1 - 4272

[S86-ex]

Head density	"Horizontal offset (in dot)"	"Vertical offset (in dot)"
8dots/mm (203 dpi)	1 - 1340	1 - 1424
12dots/mm (305 dpi)	1 - 2010	1 - 2136

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12.5 System

Print End Position

ESC+EP

Hexadecimal code	ESC	EP	Parameter
	$<1B>_{16}$	$<45>_{16}<50>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between item	The set command becomes invalid.

[Function]

Specifying the label stop position in the sensor invalid mode.

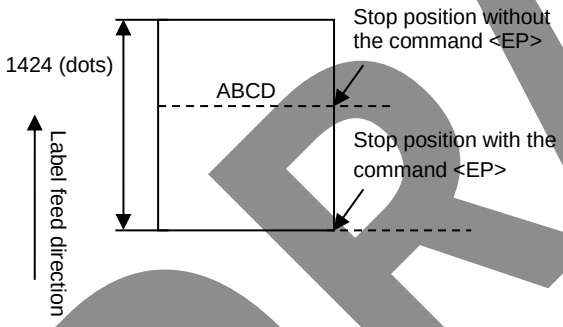
[Format]

<EP>

[Coding Example]

<A>
<A1>14240832
<Z>
<A>
<V>100<H>200<P>2<L>0202<XS>ABCD
<Q>2
<u><EP></u>
<Z>

e.g.)



[Notes]

1. Use this command in the sensor invalid mode.
2. Use this command in combination with Label Size <A1>.
3. When the media size is specified with <A1> in the format registration command <YS> and foam overlay registration command (&S), do not forget to specify the print end point command <EP> in the format recall command <YR> and foam overlay recall command <&R>.

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12.6 System

Clear — ESC+*

Hexadecimal code	ESC	*	Parameter
	$<1B>_{16}$	$<2A>_{16}$	a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Clearing the contents registered in the internal memory.

[Format]

<*>a

●Parameter

a[Item to be cleared] =

Not specified	:	Single item receive buffer, editing buffer (No reprint is allowed) Multi item receive buffer, editing buffer (Clears JOB while printing)
T	:	External character registration area
&	:	Form overlay
X	:	All clear (Receive buffer, editing buffer, registration of external character, form overlay) *Clears JOB while printing
S	:	Sub port receive data
H	:	History (Print log, STATUS5)

[Coding Example 1] Clears receive buffer and editing buffer

<A>
<*>
<Z>

[Coding Example 2] All clear

<A>
<*>X
<Z>

[Coding Example 3] Clears external character registration area

<A>
<*>T
<Z>

[Coding Example 4] Clears receive data from sub port

<A>
<*>S
<Z>

[Notes]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command to use.
2. Sending a=X (all clear) of this command will clear all data sent before the execution of this command. And also, registration of external character and form overlay will be cleared. In this case, the data that were analyzed while printing can not be cleared.

[Remarks]

1. To send the next data, wait more than 100ms after sending this command.
2. The specification of this command while printing will not stop the print operation.

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12.7 System

Offline	ESC+@

Hexadecimal code	ESC	@	Parameter
	$<1B>_{16}$	$<40>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between item	The set command becomes invalid.

[Function]

Changing the printer status from online to offline.

[Format]

<@>

[Coding Example]

<A>
<@>
<Z>

[Notes]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command to use.
2. In receive mode of the printer, specify single-item buffer mode.
3. When this command is used at offline state, the printer goes offline when the printer status becomes online next time.

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12.8 System

Reprint	ESC+C

Hexadecimal code	ESC	C	Parameter
	$<1B>_{16}$	$<43>_{16}$	Nil
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set command is not maintained.
	Valid range within item	The set command becomes invalid.
	Valid range between item	The set command becomes invalid.

[Function]

Specifying to reprint the previous printed contents.

[Format]

<C>

[Coding Example]

<A>
<C>
<Z>

[Notes]

Turning off the printer will clear the contents; therefore, reprint will not be performed by this command.

[Remarks]

For reprinting the format including the field of Sequential Numbering <F>, the same contents as previous printed contents will be printed.

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12.9 System

Registration of Printer Operation

ESC+PG

Hexadecimal code	ESC	PG	Parameter
	$<1B>_{16}$	$<50>_{16}<47>_{16}$	abcdefghhijklmnooppqqrrstuvwxy
Initial value	Refer to the table below.		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Registering the operation of the printer

[Format]

<PG>abcdefghhijklmnooppqqrrstuvwxy

●Parameter

Refer to the table in the next page for the parameter contents.

[Coding Example]

<A>

<PG><00 00 02 00 00 00 00 41 01 00 00 00 00 00 00 0C 80 03 40 00 00 00 00 0A 00 00 00 00 00 00>$_{16}$

<Z>

Parameter is described in HEX ; $<00>_{16}<00>_{16}<02>_{16}$・・・・・・$<00>_{16}$

[Notes]

1. This command is not necessary in the normal label printing operation.
2. Operation settings specified with this command are still in effect after turning off the printer.
3. Do not send the printer operation registration command <PG> during the print operation. The sensor of the printer may not be disabled if the command <PG> is sent during the print operation.
4. When there is illegal parameter, the command error occurs and the setting is not saved.

[Remark]

The registration of the printer operation can be done in the printer configuration mode and advanced mode in the printer without using the <PG> command.

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<table>
<tr><th>Parameter</th><th>Item</th><th>Description</th></tr>
<tr><td>a</td><td>Print method</td><td>00H: Thermal transfer
01H: Direct thermal
* Direct thermal only is available in the direct thermal model.</td></tr>
<tr><td>b</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>c</td><td>Print speed

[S84-ex]<table><tr><th>Head density</th><th>Range (inches/sec)</th></tr><tr><td>8dots/mm (203 dpi)</td><td>4 - 16</td></tr><tr><td>12dots/mm (305 dpi)</td><td>4 - 14</td></tr><tr><td>24dots/mm (609 dpi)</td><td>2 - 6</td></tr></table>[S86-ex]<table><tr><th>Head density</th><th>Range (inches/sec)</th></tr><tr><td>8dots/mm (203 dpi)</td><td>4 - 14</td></tr><tr><td>12dots/mm (305 dpi)</td><td>4 - 12</td></tr></table></td><td>00H: 2 (inches/sec) 50 (mm/sec)
01H: 3 (inches/sec) 75 (mm/sec)
02H: 3 (inches/sec) 75 (mm/sec)
03H: 4 (inches/sec) 100 (mm/sec)
04H: 4 (inches/sec) 100 (mm/sec)
05H: 5 (inches/sec) 125 (mm/sec)
06H: 5 (inches/sec) 125 (mm/sec)
07H: 6 (inches/sec) 150 (mm/sec)
08H: 6 (inches/sec) 150 (mm/sec)
09H: 7 (inches/sec) 175 (mm/sec)
0AH: 7 (inches/sec) 175 (mm/sec)
0BH: 8 (inches/sec) 200 (mm/sec)
0CH: 8 (inches/sec) 200 (mm/sec)
0DH: 9 (inches/sec) 225 (mm/sec)
0EH: 9 (inches/sec) 225 (mm/sec)
0FH: 10 (inches/sec) 250 (mm/sec)
10H: 10 (inches/sec) 250 (mm/sec)
11H: 11 (inches/sec) 275 (mm/sec)
12H: 11 (inches/sec) 275 (mm/sec)
13H: 12 (inches/sec) 325 (mm/sec)
14H: 12 (inches/sec) 325 (mm/sec)
15H: 13 (inches/sec) 350 (mm/sec)
16H: 13 (inches/sec) 350 (mm/sec)
17H: 14 (inches/sec) 375 (mm/sec)
18H: 14 (inches/sec) 375 (mm/sec)
19H: 15 (inches/sec) 400 (mm/sec)
1AH: 15 (inches/sec) 400 (mm/sec)
1BH: 16 (inches/sec) 425 (mm/sec)
1CH: 16 (inches/sec) 425 (mm/sec)</td></tr>
<tr><td>d</td><td>Print operation</td><td>00H: Continuous
03H: Dispense (Default)
04H: NONSEPA</td></tr>
<tr><td>e</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>f</td><td>Dispensing motion</td><td>00H: Motion 1 (at head place)
01H: Motion 2 (at dispense place) (Default)
02H: No backfeed</td></tr>
<tr><td>g</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>h</td><td>Print darkness</td><td>41H: A (Default)
42H: B
43H: C
44H: D
45H: E
46H: F</td></tr>
<tr><td>h</td><td>Print darkness level</td><td>01H: Darkness 1
02H: Darkness 2
03H : Darkness 3
04H : Darkness 4
05H: Darkness 5 (Default)
06H : Darkness 6
07H : Darkness 7
08H : Darkness 8
09H : Darkness 9
0AH : Darkness 10</td></tr>
<tr><td>i</td><td>Sensor type</td><td>00H: Reflective sensor
01H: Transmissive sensor (Default)
02H: Ignore sensor</td></tr>
<tr><td>j</td><td>Zero slash</td><td>00H: Disable
01H: Enable (Default)</td></tr>
<tr><td>k</td><td>Character code</td><td>02H: UTF-16
03H: UTF-8 (Default)</td></tr>
</table>

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<table>
<tr><th>Parameter</th><th>Item</th><th>Description</th></tr>
<tr><td>l</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>m</td><td>Initial feed</td><td>00H: Disable (Default)
01H: Enable</td></tr>
<tr><td>n</td><td>Proportional Pitch</td><td>00H: Disable
01H: Enable (Default) with international model</td></tr>
<tr><td>o</td><td>Label height (dots)</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H - 4E20H</td><td>1 - 20000 dots</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H - 4650H</td><td>1 - 18000 dots</td></tr>
<tr><td>24dots/mm
(609 dpi)</td><td>0001H - 2580H</td><td>1 - 9600 dots</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H - 2708H</td><td>1 - 9992 dots</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H – 3A8CH</td><td>1 - 14988 dots</td></tr>
</table></td></tr>
<tr><td>p</td><td>Label width (dots)</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H - 340H</td><td>1 - 832 dots</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H - 4E0H</td><td>1 - 1248 dots</td></tr>
<tr><td>24dots/mm
(609 dpi)</td><td>0001H - 9C0H</td><td>1 - 2496 dots</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H – 53CH</td><td>1 - 1340 dots</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H – 7DAH</td><td>1 - 2010 dots</td></tr>
</table></td></tr>
<tr><td>q</td><td>Vertical offset value (dots)</td><td>"0000H - 0318H" (0 - 792) (Default: 0)
"FFFFH - FCE8H" (-1 - -792)</td></tr>
<tr><td>r</td><td>Horizontal offset value (dots)</td><td>"0000H - 0318H" (0 - 792) (Default: 0)
"FFFFH - FCE8H" (-1 - -792)</td></tr>
<tr><td>s</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>t</td><td>Time to LCD power saving (in minute)</td><td>"00H - 0FH" (0 - 15) Default: 00H (0)</td></tr>
<tr><td>u</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>v</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>w</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>x</td><td>Not used</td><td>00H: fixed</td></tr>
<tr><td>y</td><td>Buzzer setting</td><td>00H: None
01H: Low
02H: Medium (Default)
03H: High</td></tr>
</table>

Refer to the “Operator Manual” for the default.

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12.10 System

Registration of Printer Operation

ESC+PC

Hexadecimal code	ESC	PC	Parameter
	$<1B>_{16}$	$<50>_{16}<43>_{16}$	1) [a, b, c, d, … y, z] 2)「aa, b」
Initial value	Refer to the table below.		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]
Registering the operation of the printer

[Format 1] When setting all the items:
<PC>a,b,c,d,e,f,g,h,i1,i2,j,k,l,m,n,o,pppp,qqqq,rrrr,ssss,t,u,v,w,x,y,z

●Parameter
a[Setting item No.] = F Setting for all the items
b[Setting content] = For the contents of parameter, refer to the table below.

[Format 2] When setting specified item:
<PC>aa,b

●Parameter
aa[Setting item No.] = Valid range : 1 to 26
b[Setting content] = For the contents of parameter, refer to the table below.

[Coding Example 1] Setting all the items:
<A>
<PC>F,,,2,,,,,A,4,,1,0,,1,1,3000,1200,,,,,,,,1
<Z>

[Coding Example 2] Setting specified items:
<A>
<PC>26,1
<Z>

[Notes]
1. Go to the User Mode, Advanced Mode or Service Mode of the printer for setting.
2. Operation settings specified with this command are still in effect after turning off the printer.
3. To set all the items, entire or part of parameter entry is omissible by using comma. In this case, comma is not omissible. When omitting the settings, the default value will be set.
4. Avoid specifying this command while printing or while print data exist. If so, there is no guarantee of proper operation.
5. When there is illegal parameter, the command error occurs and the setting is not saved.

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<table>
<tr><th>Format1</th><th>Format2</th><th>Item</th><th>Description</th></tr>
<tr><td>b</td><td>1</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>c</td><td>2</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>d</td><td>3</td><td>Print speed

[S84-ex]<table><tr><th>Head density</th><th>Range (inches/sec)</th></tr><tr><td>8dots/mm (203 dpi)</td><td>4 - 16</td></tr><tr><td>12dots/mm (305 dpi)</td><td>4 - 14</td></tr><tr><td>24dots/mm (609 dpi)</td><td>2 - 6</td></tr></table>[S86-ex]<table><tr><th>Head density</th><th>Range (inches/sec)</th></tr><tr><td>8dots/mm (203 dpi)</td><td>4 - 14</td></tr><tr><td>12dots/mm (305 dpi)</td><td>4 - 12</td></tr></table></td><td>0: 2 (inches/sec) 50 (mm/sec)
1: 3 (inches/sec) 75 (mm/sec)
2: 3 (inches/sec) 75 (mm/sec)
3: 4 (inches/sec) 100 (mm/sec)
4: 4 (inches/sec) 100 (mm/sec)
5: 5 (inches/sec) 125 (mm/sec)
6: 5 (inches/sec) 125 (mm/sec)
7: 6 (inches/sec) 150 (mm/sec)
8: 6 (inches/sec) 150 (mm/sec)
9: 7 (inches/sec) 175 (mm/sec)
10: 7 (inches/sec) 175 (mm/sec)
11: 8 (inches/sec) 200 (mm/sec)
12: 8 (inches/sec) 200 (mm/sec)
13: 9 (inches/sec) 225 (mm/sec)
14: 9 (inches/sec) 225 (mm/sec)
15: 10 (inches/sec) 250 (mm/sec)
16: 10 (inches/sec) 250 (mm/sec)
17: 11 (inches/sec) 275 (mm/sec)
18: 11 (inches/sec) 275 (mm/sec)
19: 12 (inches/sec) 325 (mm/sec)
20: 12 (inches/sec) 325 (mm/sec)
21: 13 (inches/sec) 350 (mm/sec)
22: 13 (inches/sec) 350 (mm/sec)
23: 14 (inches/sec) 375 (mm/sec)
24: 14 (inches/sec) 375 (mm/sec)
25: 15 (inches/sec) 400 (mm/sec)
26: 15 (inches/sec) 400 (mm/sec)
27: 16 (inches/sec) 425 (mm/sec)
28: 16 (inches/sec) 425 (mm/sec)</td></tr>
<tr><td>e</td><td>4</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>f</td><td>5</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>g</td><td>6</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>h</td><td>7</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>i1</td><td>8</td><td>Print darkness</td><td>A: fixed</td></tr>
<tr><td>i2</td><td>9</td><td>Print darkness level</td><td>1: Darkness 1
2: Darkness 2
3: Darkness 3
4: Darkness 4
5: Darkness 5 (Default)
6: Darkness 6
7: Darkness 7
8: Darkness 8
9: Darkness 9
10: Darkness 10</td></tr>
<tr><td>j</td><td>10</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>k</td><td>11</td><td>Zero slash</td><td>0: DISABLE
1: Enable (Default)</td></tr>
<tr><td>l</td><td>12</td><td>Character code</td><td>2: UTF-16
3: UTF-8 (Default)</td></tr>
<tr><td>m</td><td>13</td><td>Not used</td><td>0: fixed</td></tr>
</table>

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<table>
<tr><th>Format1</th><th>Format2</th><th>Item</th><th>Description</th></tr>
<tr><td>n</td><td>14</td><td>Initial feed</td><td>0: Disable (Default)
1: Enable</td></tr>
<tr><td>o</td><td>15</td><td>Proportional Pitch</td><td>0: DISABLE
1: Enable (Default)</td></tr>
<tr><td>pppp</td><td>16</td><td>Label height (dots)</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H - 4E20H</td><td>1 - 20000</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H - 4650H</td><td>1 - 18000</td></tr>
<tr><td>24dots/mm
(609 dpi)</td><td>0001H - 2580H</td><td>1 - 9600</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H - 2708H</td><td>1 - 9992</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H – 3A8CH</td><td>1 - 14988</td></tr>
</table></td></tr>
<tr><td>qqqq</td><td>17</td><td>Label width (dots)</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H - 340H</td><td>1 - 832</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H - 4E0H</td><td>1 - 1248</td></tr>
<tr><td>24dots/mm
(609 dpi)</td><td>0001H - 9C0H</td><td>1 - 2496</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm
(203 dpi)</td><td>0001H – 53CH</td><td>1 - 1340</td></tr>
<tr><td>12dots/mm
(305 dpi)</td><td>0001H – 7DAH</td><td>1 - 2010</td></tr>
</table></td></tr>
<tr><td>rrrr</td><td>18</td><td>Vertical offset value (dots)</td><td>0 - 792 (Default: 0)
-1 - -792</td></tr>
<tr><td>ssss</td><td>19</td><td>Horizontal offset value (dots)</td><td>0 - 792 (Default: 0)
-1 - -792</td></tr>
<tr><td>t</td><td>20</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>u</td><td>21</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>v</td><td>22</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>w</td><td>23</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>x</td><td>24</td><td>Time to LCD power saving (in minute)</td><td>0 - 15 Default: 0</td></tr>
<tr><td>y</td><td>25</td><td>Not used</td><td>0: fixed</td></tr>
<tr><td>z</td><td>26</td><td>Buzzer setting</td><td>0: none
1: Small
2: Medium (Default)
3: Large</td></tr>
</table>

Refer to the “Operator Manual” for the default.

DRAFT

12.11 System

Auto Linefeed

ESC+E

Hexadecimal code	ESC	E	Parameter
	$<1B>_{16}$	$<45>_{16}$	aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying line pitch and linefeed.

[Format]

<E>aaa

●Parameter

a[Line pitch width] = Valid range : 0 to 999 dots

[Coding Example]

<A>
<E>10
<V>100<H>200<P>2<L>0304<XM>,ABCDE+CR
FGHIJ+CR
<Q>2
<Z>

[Notes]

1. When CR (0DH) is specified, linefeed based on line pitch will be performed.
2. Rotation <%> is enabled.
3. Line pitch is changeable by this command within items
4. Specify this command before designating the consecutive print of 1-line.
5. Performing auto linefeed by the designation of CR (0DH), print start position of linefeed will be determined based on the pitch specified with <E> and the value specified with Horizontal Print Position <H> designated after <E>.
   In case that <H> is specified several times after <E>, return position by CR (0DH) will be at the end of <H>.

DRAFT

12.12 System

Kanji Mincho

ESC+KM

Hexadecimal code	ESC	KM	Parameter
	$<1B>_{16}$	$<4B>_{16}<4D>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specifying the MINCHO for Kanji font

[Format]

<KM>

[Coding Example]

<A>
<KM>
<V>100<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<KG>
<V>200<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<Q>2
<Z>

[Notes]

1. This command can be used more than one time in the same item.
2. The default is set to GOTHIC.

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12.13 System

Kanji Gothic

ESC+KG

Hexadecimal code	ESC	KG	Parameter
	<1B>16	<4B>16<47>16	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specifying the GOTHIC for Kanji font

[Format]

<KG>

[Coding Example]

<A>
<KG>
<V>100<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<KG>
<V>200<H>200<P>2<L>0304
<K1>H82508A94816A83548367815B
<Q>2
<Z>

[Notes]

1. This command can be used more than one time in the same item.
2. The default is set to GOTHIC.

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12.14 System

User Download

ESC+LD

Hexadecimal code	ESC	LD	Parameter
	$<1B>_{16}$	$<4C>_{16}<44>_{16}$	,a,b,c,d,e,f,g,h,i,j
Initial value	Refer to the table below		

Valid range and term of command	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Setting the auto-online, availability of zero slash, protocol code and Euro code.

[Format]

<LD>,a,b,c,d,e,f,g,h,i,j

●Parameter

Refer to the table below for the details.

Function	Parameter	Content	Default	
			Standard	Non-standard
Protocol code	a (Hex)	STX	02H	{ (7BH)
	b (Hex)	ETX	03H	} (7DH)
	c (Hex)	ESC	1BH	^ (5EH)
	d (Hex)	ENQ	05H	@ (40H)
	e (Hex)	CAN	18H	! (21H)
	f (Hex)	NULL	00H	~ (7EH)
	g (Hex)	Offline	40H	] (5DH)
Auto online	h (ASCII)	0 : YES 1 : NO	0 (30H)	0 (30H)
Zero slash	i (ASCII)	0 : YES 1 : NO	0 (30H)	0 (30H)
Euro Code	j (Hex)	D5H	D5H	D5H

[Coding Example]

<A>

<LD>,{,},%,#,&,=,~,0,0,$<FF>_{16}$

<Z>

[Notes]

1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
2. Entire or part of parameter entry is omissible by using comma. In this case, comma is not omissible. Omitted setting will remain as default.
3. If number of commas within parameter is other than 10, or if the specified code is included in the other control code, command, or print data, operation will not be accurate.
4. Parameter a ~ g of Protocol code will be enabled by setting to Non-standard through Protocol code setting screen in the Advanced Mode.

[Important]

1. When using the Kanji specifying command, Shift JIS and UNICODE are available, and only default (STX: 7B, ETX: 7D, ESC: 5E, ENQ: 40, CAN: 21) is supported in the control code.
   The above is closed to the users.

DRAFT

12.15 System

Offset

ESC+PO

Hexadecimal code	ESC	PO	Parameter
	$<1B>_{16}$	$<50>_{16}<4F>_{16}$	abcc
Initial value	-		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specify the label stop position adjustment in each motion temporary.

[Format]

<PO>abcc

●Parameter

a [offset]	=	1	:	dispense mode
		3	:	continuous mode
b [offset direction]	=	+	:	paper feed direction
		-	:	backfeed direction
c [offset length]	=	Valid range	:	00 to 99 dots

[Coding Example]

<A>
<PO>3+08
<Z>

[Notes]

1. This command is not necessary to specify at the normal label printing.
2. Specify this command when there is a particular misalignment.

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12.16 System

Job Modification

ESC+#J

Hexadecimal code	ESC	#J	Parameter
	$<1B>_{16}$	$<23>_{16}<4A>_{16}$	Nil
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Register job modification character string.

[Format]

<#J>,a,b,c

●Parameter

a [ID number] = Valid range : 0 or 1 to 9 (default: 0 delete all job modification pairs)
b [Search character string] = Valid range : 00 to FF (default: delete designated modification pairs)
c [Replace character string] = Valid range : 00 to FF (default: no replace character string)

[Coding Example]

<A>
<#J>,1,1B584D,1B584C
<Z>

[Notes]

1. Specify the search and replace character string in 2 digits ASCII in HEX.
2. When 0 is specified for an ID number, all job modification pairs are deleted.
3. When the search character string parameter is omitted, the specified job modification pair is deleted.
4. When replace character string parameter is omitted, replace is not done and only search character string is deleted from the input data.

[Remarks]

1. The search or replace character string for job modification is saved in the EEPROM, and it is maintained until it is deleted or job modification function is disabled.
2. The search or replace character string can be specified up to 100 characters, 9 pairs in total. For example, a pair of search/replace character string has 50 characters each, only one pair can be used.
3. The character string is searched in the order of from #J1 to #J9. When higher priority search character string is the subset of lower priority search character string, the lower priority search character string is ignored.
4. When the HEX dump mode is used for the printing of the received data, print output depends on the job modification setting.
5. The job modification function is disabled automatically during the test print mode.

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13 Memory Card Command

13.1 Memory Card

Card Slot for Use	ESC+CC

Hexadecimal code	ESC	CC	Parameter
	<1B>16	<43>16<43>16	a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specifying the slot No. for use.
The printer can access to the media registered to the specified slot.

[Format]

<CC>a

●Parameter

a [Slot No.] = 0 : Slot 0 (Default: printer)
1 : Slot 1 (Default: FROM)
2 : Slot 2 (Default: SD card)

[Coding Example]

<A>
<CC>1
<GI>H003003001FF000000～000000FF
<Z>

[Notes]

1. The allocation of the slot number can be changed from the above default in the memory card mode. Items can be set to the each slot number are "Printer", "FROM", "SD card", "USB memory", and "Not used." Refer to the Operator Manual for details.
   * "Printer": Printer memory, "FROM": Flash ROM
2. It is necessary to specify when accessing to "FROM", "SD card" and "USB memory."
3. The command error occurs when unused slot is specified.
4. Please confirm that the media is mounted when specifying "SD card" or "USB memory."
   The command error occurs when the printer accessed to the slot when the media is not mounted.

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.2 Memory Card

Registration of Form Overlay

ESC+&S

Hexadecimal code	ESC	&S	Parameter
	$<1B>_{16}$	$<26>_{16}<53>_{16}$	,aa(,bbbb,ccccc)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The registered data are in effect until a new specification is made.
	Valid range between item	The registered data are in effect until a new specification is made.

[Function]

Specifying the registration of fixed print contents to a memory card.

[Format]

<&S>,aa(,bbbb,ccccc)

●Parameter

a[Registration No.] = Valid range : 1 to 99
b[Size specification of window width] = Valid range : Refer to the table below (Omissible)
c[Size specification of window height] = Valid range : Refer to the table below (Omissible)

[Coding Example]

<A>
<V>100<H>100<XM>,MODEL
<CC>1
<&S>,1
<Z>

[Notes]

1. Specify slot No. with Card Slot for Use <CC> prior to this command.
2. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with the format to be registered.
3. Registration of identical registration No. is invalid.
4. Both Print data of Graphic <G> and Print of BMP File <GM> can be registered.
5. This command allows up to 99 registries. Note that the capacity of registry may vary depending on the memory card to be used.
6. Data registered with this command can be cleared with Clear <*>R.
7. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

[Valid range of the window size]

[S84-ex]

Head density	Horizontal direction available range(dot)	Vertical direction available range(dot)
8dots/mm (203 dpi)	1 - 832	1 - 20000
12dots/mm (305 dpi)	1 - 1248	1 - 18000
24dots/mm (609 dpi)	1 - 2496	1 - 9600

[S86-ex]

Head density	Horizontal direction available range(dot)	Vertical direction available range(dot)
8dots/mm (203 dpi)	1 - 1340	1 - 9992
12dots/mm (305 dpi)	1 - 2010	1 - 14988

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[Valid Commands]

Print position	<V>	<H>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<U>	<S>	<M>
	<WB>	<WL>								
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BP>
	<BF>	<BS>	<BL>	<BL><d>	<BM>	<BM>				
2D code	<2D10>	<BK>	<2D12>	<2D20>	<BV>	<2D30>	<2D31>	<2D32>	<BQ>	<2D33>
	<2D50>	<BX>	<2D51>							
Composite symbol	<EU>									
Modification	<WD>	<FW>	<(>	<RF>	<FC>	<FT>	<RM>			
Graphic	<G>	<GM>	<GP>							

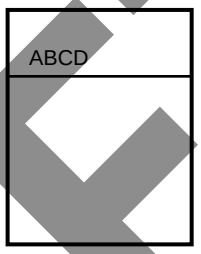
In general, this command is used for [Registration No.] only. Specification of window height and width will control the movement with Vertical Print Position <V> and Horizontal Print Position <H> at the time of calling. For the movement at the time of calling, if registered area is exceeding print area, the portion outside of the print area will not be printed.

The following are the brief operation.

1) Normal (To register)

```
<A>
<V>100<H>100<P>2<L>0202
<XB>0ABCD
<V>60<H>60
<FW>0808V800H400
<V>320<H>60
<FW>04H400
<CC>1
<&S>,1
<Z>
```

Registered image



2) When the print is specified after the command <&S>

```
<A>
<V>100<H>100<P>2<L>0202
<XB>0ABCD
<V>60<H>60
<FW>0808V800H400
<V>320<H>60
<FW>04H400
<CC>1
<&S>,1
<V>200<H>100<OB>12345
<Z>
```

Anything specified prior to the command <&S> will be registered as form overlay.

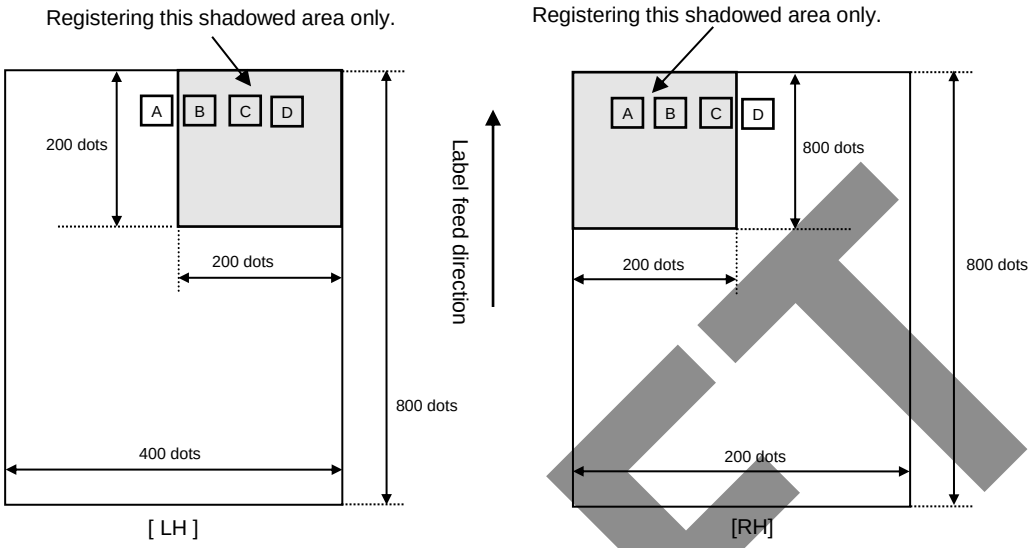
← Printing out this part

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3) When the window size is specified

Label Size <A1>00800400, Window width [200], Window height [200]

<A>
<A1>08000400
<V>100<H>00<P>2<L>0202
<XB>0ABCD
<CC>1
<&S>,1,200,200
<Z>



[LH] [RH]

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13.3 Memory Card

Form Overlay Call

ESC+&R

Hexadecimal code	ESC	&R	Parameter
	$<1B>_{16}$	$<26>_{16}<52>_{16}$	,aa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Invoking the contents in memory card with Registration of Form Overlay <&S>.

[Format]

<&R>,aa

●Parameter

a[Registration No.] = Valid range : 1 to 99

[Coding Example]

<A>
<CC>1
<&R>,1
<Z>

[Notes]

1. Specify slot No. of Card Slot for Use <CC> prior to this command when using.
2. This command can be combined with different registration No. and printed.
3. When registration No. is not specified, this command will be ignored.
4. If specifying unregistered No., Read/Write error will occur.
5. When registering without specifying window, Vertical Print Position <V> and Horizontal Print Position <H> will be ignored and V1 and H1 (Start position of drawing area) will be determined.
6. When specifying and registering window, movement with <V> and <H> will be enabled.
   Note that when exceeding print area, the portion outside of the print area will not be printed.
7. This command is not effective without a memory card.
8. The error occurs when unused or the slot which the printer is allocated is specified.

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

[Valid Commands]

Print position	<V>	<H>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<K1>	<K2>
	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>	<$=>			
Barcode	<B>	<BC>	<BG>	<BI>	<BP>	<D>	<D><d>	<BD>	<BT>	<BW>
	<BF>	<EU>	<BL>	<BL><d>	<BM>					
2D code	<BK>	<BQ>	<BV>	<BX>	<2D31>	<2D30>	<2D32>	<2D20>	<2D10>	<2D12>
	<2D50>									
Modification	<WD>	<FW>	<(>	<RF>	<FC>	<FT>				
Graphic	<G>	<GM>	<GP>							

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13.4 Memory Card

Registration of Format

ESC+YS

Hexadecimal code	ESC	YS	Parameter
	$<1B>_{16}$	$<59>_{16}<53>_{16}$	,aaaaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]
Registering print format.

[Format]
<YS>,aaaaa

●Parameter
aaaaa[Format registration No.] = Valid range : 00001 to 99999

[Coding Example]
<A>
<CC>1
<YS>,1
</N>,3,3
<%>0<V>100<H>200<P>2<L>0101<XM>ABC
<Z>

[Notes]
1. When registering multiple formats, Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with one format.
2. Specify Card Slot for Use <CC> prior to this command when using.
3. Use this command and Registration of Field </N> as a set.
4. Attempts to re-register with registered No., an error will occur, and the targeted content will be printed.
5. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

[Valid Commands for Registration]

Print position	<V>	<H>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>			
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	
Modification	<P>	<L>	<PS>	<PR>	<%>	<FW>	<(>	<WD>		
System	<A1>	<A3>	<AX>	<AR>						
Memory card	<&R>	</N>	<GR>	<GC>						

(Caution) The operation when specified a command that is other than available command is not guaranteed.

[Important]
1. Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.
2. The maximum registration with </N> is 99 fields. (Refer to the customizable print command of the field registration(ESC+/N) for the commands can be registered.)
3. The maximum registration with other than </N> is 50 fields. Refer to the customizable print command for the commands can be registered.)

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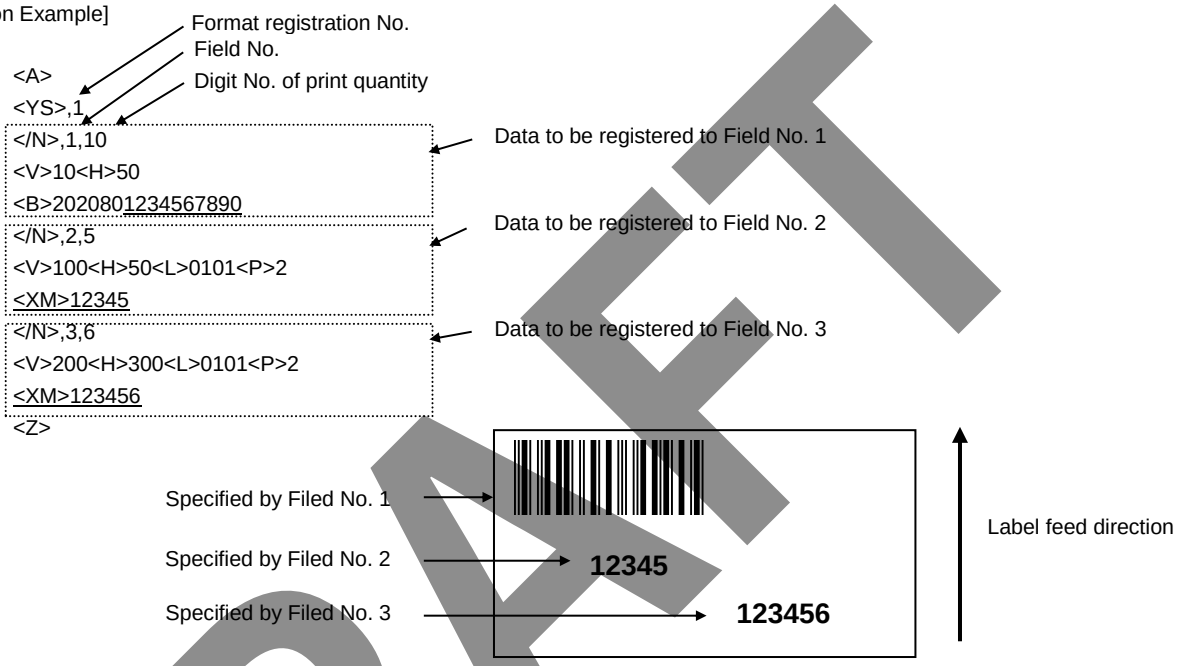
[Remark]

Details of Format Registration

A group of commands can be registered to a memory card (option). Once registered, it saves time to specify the identical command group.
The registration also allows a change of print data when invoking the format. Such function is called “Format Registration”.
One item consists of different command groups necessary for printing, and such groups are called “Field”. Note that multiple fields make format.

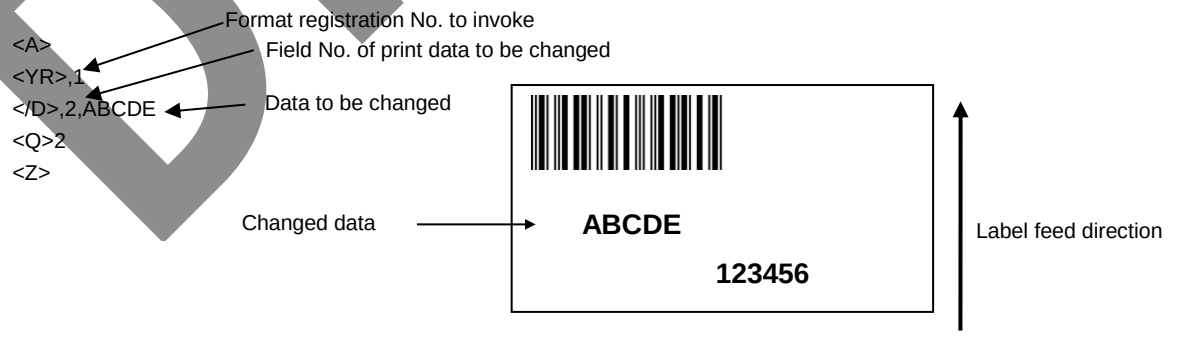
Commands for format registration :
One format consists of a set of commands from Start of Data Transmission <A> to End of Data Transmission <Z>, and specify Registration of Format <YS> right after <A>. For <YS>, specify [Format registration No.] between 1 and 99999. And then, insert Registration of Field </N> after <YS> to specify [Field No.] and [Digit No. of print quantity].
After [Field No.] and [Digit No. of print quantity] is entered, specify print position, character type, barcode, and so on.

[Registration Example]



Invoking the registered print contents
Specify saved [Format registration No.] between 1 and 99999 with Format Call <YR>.
To change print data, use Print of Field <D> to specify [Field No.] to be changed, and continuously specify the changed print data.
Note that the underlined parts in the [Registration Example] are changeable.

[Calling Example]



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13.5 Memory Card

Registration of Field

ESC+/N

Hexadecimal code	ESC	/N	Parameter
	$<1B>_{16}$	$<2F>_{16}<4E>_{16}$	,aa,bb
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Registering items within the field of Registration of Format <YS>.

[Format]

</N>,aa,bb

●Parameter

a[Field No.] = Valid range : 1 to 99

b[Digit No. of print quantity] = Valid range : 1 to 99

[Coding Example]

<A>
<CC>1
<YS>, 1
</N>,1,3
<%>0<V>100<H>200<P>2<L>0101<XM>ABC
</N>,2,5
<%>0<V>200<H>200<P>2<L>0101<OA>12345
</N>,3,8
<%>0<V>300<H>40<B>40208049123456
<Z>

[Notes]

1. Specify the value of [Field No.] in ascending order.
2. Specify Vertical Print Position <V> and Horizontal Print Position <H> for each field. If not, the default value will be set.
3. Specification of digit number when printing external character.
   External code H, one external character has 4 digits; thus, three external characters make 12 digits for printing.
   External code B, one external character has 2 digits; thus, three external characters make 6 digits for printing.
4. Use this command and Registration of Format <YS> as a set.
5. Due to the memory capacity limit, it may not save up to 99 registries.
6. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

[Valid Commands for the Change of Print]

Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>	<RD>	<$=>	<K1>
	<K2>	<K8>	<K9>	<k1>	<k2>	<k8>	<k9>			
Modification	<P>	<L>	<PS>	<PR>	<%>					
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	<BL>

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13.6 Memory Card

Format Call	ESC+YR

Hexadecimal code	ESC	YR	Parameter
	$<1B>_{16}$	$<59>_{16}<52>_{16}$	,aaaaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Invoking and printing out the format registered with Registration of Format <YS>.

[Format]

<YR>,aaaaa

●Parameter

aaaaa[Format registration No.] = Valid range : 00001 to 99999

[Coding Example]

```
<A>
<CC>1
<YR>,1
</D>,1,DEF
</D>,2,78901
</D>,3,49000238
<Q>2
<Z>
```

[Notes]

1. This command cannot invoke multiple formats between Start of Data Transmission <A> and End of Data Transmission <Z>.
2. Use this command and Print of Field </D> as a set.
3. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.7 Memory Card

Print of Field

ESC+/D

Hexadecimal code	ESC	/D	Parameter
	$<1B>_{16}$	$<2F>_{16}<44>_{16}$	,aa,n~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Invoking the items registered with Registration of Field and specifying data.

[Format]

</D>,aa,n~n

●Parameter

a[Field No.] = Valid range : 1 to 99

n[Data] = Data to be changed

[Coding Example]

<A>
<CC>1
<YR>,1
</D>,1,DEF
</D>,2,78901
</D>,3,49000238
<Q>2
<Z>

[Notes]

1. Digit No. of print quantity is valid within the range specified with Registration of Field </N>.
2. When digit No. of this command is larger than the one specified with Registration of Field </N>, only the defined digit No. will be available for printing.
3. Use this command and Format Call <YR> as a set.
4. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.8 Memory Card

Registration of Graphic

ESC+GI

Hexadecimal code	ESC	GI	Parameter
	$<1B>_{16}$	$<47>_{16}<49>_{16}$	abbbcccdddn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the registration of graphic pattern data.

[Format]

<GI>abbbcccdddn~n

●Parameter

a[Selection of data transfer in HEX or BIN] = H : Hex data
B : Binary data

Hex data(specify graphic data as 2 characters of ASCII 0-F is equal to 8 dots)
Binary data(specify graphic data as 1 byte of binary data is equal to 8 dots)

b[Specification of crosswise graphic area per byte] = Refer to the table below
c[Specification of lengthwise graphic area per byte] = Refer to the table below
d[Registration No.] (Identification No. when invoking) = 1 to 999
n[Data] = Graphic data

[Coding Example 1] [H: HEX data] is specified as [Selection of data transfer in HEX or BIN]

<A>
<CC>1
<GI>H001001999<4646383138313831383138313831383146 46>$_{16}$
<Z>

[Coding Example 2] [B: Binary data] are specified as [Selection of data transfer in HEX or BIN]
[□] is registered to the 999th of the slot 1 by the below.

<A>
<CC>1
<GI>B001001999<B001001999<FF818181818181FF>$_{16}$
<Z>

[Notes]

1. Specify registered data only.
2. To change the registered content, clear it with Clear <*> to re-register.
3. Graphic Call <GR> is for printing out the data registered with Registration of Graphic <GI>.
4. When data are not registered properly, print error may occur. For details of data format, refer to Print of Graphic <G>.
5. Attempts to re-register with registered No., an error will occur, and the targeted content will be printed.
6. Specify Card Slot for Use <CC> prior to this command when using.
7. Make sure to specify the slot number used for card slot command <CC> before the graphic registration command <GI>.
8. The error occurs when unused or the slot which the printer is allocated is specified**(**Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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[Specified Range]

[S84-ex]

Head density	Maximum byte in horizontal direction	Maximum byte in vertical direction
8dots/mm (203 dpi)	104	400
12dots/mm (305 dpi)	156	600
24dots/mm (609 dpi)	312	999

[S86-ex]

Head density	Maximum byte in horizontal direction	Maximum byte in vertical direction
8dots/mm (203 dpi)	168	400
12dots/mm (305 dpi)	252	600

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13.9 Memory Card

Graphic Call

ESC+GR

Hexadecimal code	ESC	GR	Parameter
	$<1B>_{16}$	$<47>_{16}<52>_{16}$	aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Invoking and printing out the data registered with Registration of Graphic <GI>.

[Format]

<GR>aaa

●Parameter

a[Registration No.] = Valid range : 1 to 999

[Coding Example]

<A>
<V>100<H>100
<CC>1
<GR>1
<Q>1
<Z>

[Notes]

1. Make sure to specify the slot number used for card slot command <CC> before the graphic recall command <GR>.
2. Ignoring Base Reference Point Offset <A3> and making no correction.
3. Rotation <%> and Enlargement <L> are available for the invoked graphic.
4. Specify Card Slot for Use <CC> prior to this command when using.
5. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.10 Memory Card

Registration of BMP File

ESC+GT

Hexadecimal code	ESC	GT	Parameter
	$<1B>_{16}$	$<47>_{16}<54>_{16}$	aaa,bbbbb,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the registration of BMP file created by such as Paint Brush of Windows.

[Format]

<GT>aaa,bbbbb,n~n

●Parameter

a[Registration No.] = 1 to 999

b[Total bytes of BMP file] = 1 to 99999

Specify the file size of BMP file for total bytes.

n[Data] = BMP file data

Data is sent as binary data (Outputs 8 bits as one character data all at once)

[Coding Example]

<A>
<CC>1
<GT>1,12345,n~n
<Z>

[Notes]

1. Make sure to specify the slot number used for card slot command <CC> before the BMP file registration command <GT>.
2. Data is sent as binary data (Outputs 8 bits as one character data all at once). In this case, the file size of BMP file becomes the total bytes, and BMP file data becomes data.
3. In BMP file, 62 bytes of data is for the header part and the rest of data is for the image data.
4. When [Total bytes of BMP file] are not matching the transfer data, this may become the cause of malfunction.
5. Total bytes are the file size displayed at [Property] and such.
6. BMP file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for the BMP compressed file. Make sure that the file extension is set to [BMP] before printing.
7. Specify Card Slot for use <CC> prior to this command.
8. The error occurs when unused or the slot which the printer is allocated is specified(Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.11 Memory Card

BMP File Call

ESC+GC

Hexadecimal code	ESC	GC	Parameter
	$<1B>_{16}$	$<47>_{16}<43>_{16}$	aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Invoking and printing out the data registered with Registration of BMP File.

[Format]

<GC>aaa

●Parameter

a[Registration No.] = Valid range : 1 to 999

[Coding Example]

<A>
<V>100<H>100
<CC>1
<GC>1
<Q>2
<Z>

[Notes]

1. Make sure to specify the slot number used for card slot command <CC> before the BMP file recall command <GC>.
2. Rotation <%> and Enlargement <L> are available for the invoked data.
3. Specify Card Slot for Use <CC> prior to this command when using.
4. The error occurs when unused or the slot which the printer is allocated is specified(Refer to Card Slot for Use <CC>)..

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.12 Memory Card

Registration of PCX File

ESC+PI

Hexadecimal code	ESC	PI	Parameter
	$<1B>_{16}$	$<50>_{16}<49>_{16}$	aaa,bbbbb,n~n
Initial value	Nil		

Valid range and term of command	When power switch is OFF	The registered data becomes valid.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the registration of PCX file created by such as Paint Brush of Windows.

[Format]

<PI>aaa,bbbbb,n~n

●Parameter

a[Registration No.] = 1 to 999

b[Total bytes of PCX file] = 1 to 99999

Specify the file size of PCX file for total bytes.

n[Data] = PCX file data

Data is sent as binary data (Outputs 8 bits as one character data all at once)

[Coding Example]

<A>

<CC>1

<u><PI>001,12345,n~n</u>

<Z>

[Notes]

1. Make sure to specify the slot number used for card slot command <CC> before the PCX file registration command <PI>.
2. Data is sent in binary data (Outputs 8-bit data as 1 font data all at once). (The file size of PCX file is the total bytes of PCX file, and PCX file data are data)
3. When [Total bytes of PCX file] are not matching the transfer data, this may become the cause of malfunction.
4. Total bytes are the file size displayed at [Property] and such.
5. PCX file is available in Black/White mode only. In color mode, printing will not be performed due to command error. Also, this command is not valid for the PCX compressed file. Make sure that the file extension is set to [PCX] before printing.
6. Specify Card Slot for Use <CC> prior to this command when using.
7. The error occurs when unused or the slot which the printer is allocated is specified(Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.13 Memory Card

PCX File Call

ESC+PY

Hexadecimal code	ESC	PY	Parameter
	$<1B>_{16}$	$<50>_{16}<59>_{16}$	aaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Invoking and printing out the data registered with Registration of PCX File <PI>.

[Format]

<PY>aaa

●Parameter

a[Registration No.] = Valid range : 1 to 999

[Coding Example]

<A>
<V>100<H>100
<CC>1
<PY>001
<Q>2
<Z>

[Notes]

1. Make sure to specify the slot number used for card slot command <CC> before the PCX file recall command <PY>.
2. Rotation <%> and Enlargement <L> are available for the invoked data.
3. Specify Card Slot for Use <CC> prior to this command when using.
4. The error occurs when unused or the slot which the printer is allocated is specified(Refer to Card Slot for Use <CC>).

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.14 Memory Card

Memory card 16x16 dots External Font Registration

ESC+T1

Hexadecimal code	ESC	T1	Parameter
	$<1B>_{16}$	$<54>_{16}<31>_{16}$	abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Register 16x16 dots external characters to the memory card.

[Format]

<T1>abbn~n

●Parameter

a[Select register data type] = H : HEX character
B : Binary code

b[Register font code address] = H : in the range from “21” to “7F”, up to 95 items can be registered
B : in the range from 21H to 7FH, up to 95 items can be registered

n[External character registration data]

[Coding Example]

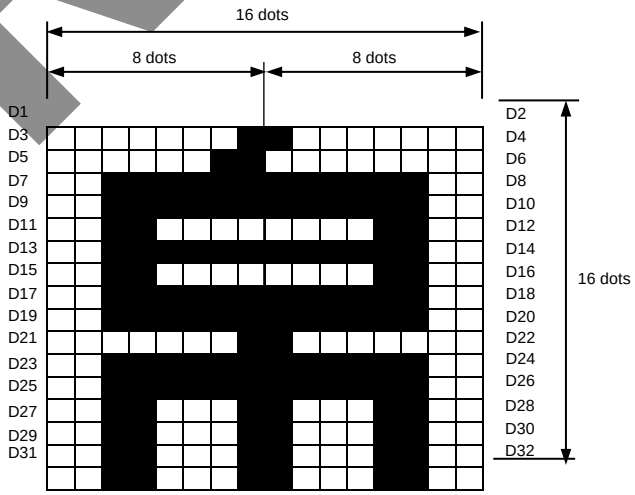
<A>
<CC>1
<u><T1>H2100FF00FF～3C0000FF</u>
<Z>

[Notes]

1. It is possible to overwrite the data that is registered once.
2. Make sure to specify the slot number used for card slot command <CC> before the memory card 16x16 external character registration command <T1>.
3. The error may occur when other registration command and the memory card 16x16 external character registration command <T1> at the same time due to not enough memory in the memory card. As a countermeasure, register other registration to another memory card or use a memory card that has more capacity.
4. The output order of the data is as follows.
5. The error occurs when unused slot is specified.

External file [16x16]

D1	D2
D3	D4
D5	D6
⋮	⋮
D31	D32



When registering the above external character, D1 data are $<01>_{16}$, D2 data are $<80>_{16}$ because the constitution of D1 is [00000001], and D2 is [10000000].
In the same manner, D3 is $<03>_{16}$, D4 is $<00>_{16}$, D5 is $<3F>_{16}$, D6 is $<FC>_{16}$, and the external registration data will be $<018003003FFC.....>_{16}$ up to D32.

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.15 Memory Card

Memory card 24x24 dots External Font Registration

ESC+T2

Hexadecimal code	ESC	T2	Parameter
	$<1B>_{16}$	$<54>_{16}<32>_{16}$	abbn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Register 24x24 dots external characters to the memory card.

[Format]

<T2>abbn~n

●Parameter

a[Select register data type] = H : HEX character
B : Binary code

b[Register font code address] = H : in the range from “21” to “7F”, up to 95 items can be registered
B : in the range from 21H to 7FH, up to 95 items can be registered

n [External character registration data]

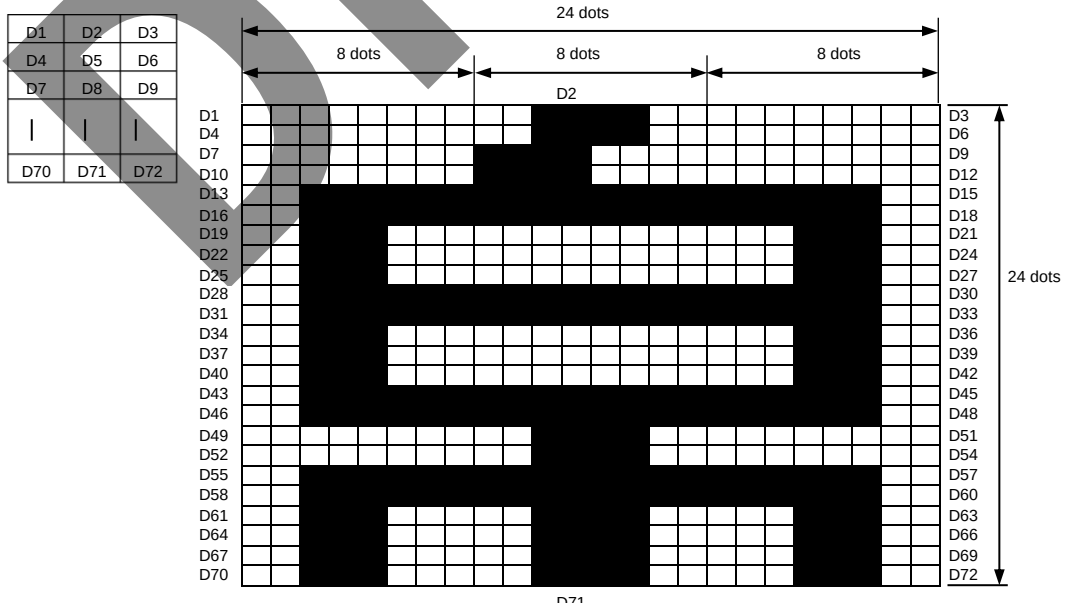
[Coding Example]

<A>
<CC>1
<u><T2>H2100FF00FF~3C0000FF</u>
<Q>2
<Z>

[Notes]

1. It is possible to overwrite the data that is registered once.
2. Make sure to specify the slot number used for card slot command <CC> before the memory card 24x24 external character registration command <T2>.
3. The error may occur when other registration command and the memory card 24x24 external character registration command <T2> at the same time due to not enough memory in the memory card. As a countermeasure, register other registration to another memory card or use a memory card that has more capacity.
4. The output order of the data is as follows.
5. The error occurs when unused or the slot which the printer is allocated is specified (Refer to Card Slot for Use <CC>).

External file [24x24]



When registering the above external character, D1 data are $<00>_{16}$, D2 data are $<3C>_{16}$, D3 data are <00>16 because the constitution of D1 is [00000000], D2 is [00111100] and D3 is [00000000].

In the same manner, D4 is $<00>_{16}$, D5 is $<3C>_{16}$, D6 is $<00>_{16}$, and the external registration data will be $<003C00003C00.....>_{16}$ up to D72.

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[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.16 Memory Card

Memory Card Horizontal Writing External Character Recall

ESC+K1(K2)

Hexadecimal code	ESC	K1(K2)	Parameter
	$<1B>_{16}$	$<4B>_{16}<31>_{16}(<4B>_{16}<32>_{16})$	abbn~n
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Recall the external characters registered to memory card.

[Format]

<K1>an~n
<K2>an～n

●Parameter

a [External characters registration] =
- H : HEX character
- B : Binary code
- I : HEX character with smoothing function
- C : Binary code with smoothing function
- J : HEX character with highlight function
- D : Binary code with highlight function
- K : HEX character with smoothing and highlight function
- E : Binary code with smoothing and highlight function

n~n [Registration code] =

<GB18030 specification>
- H, I, J, K : “8021” ~ “807F”
- B, C, D, E : 8021H ~ 807FH

<BIG5/KSX1001 specification>
- H, I, J, K : “9021” ~ “907F”
- B, C, D, E : 9021H ~ 907FH

[Coding Example]

```
<A>
<V>100<H>100
<CC>1
<K1>H9021
<Q>2
<Z>
```

[Notes]

1. Make sure to specify the card slot command <CC> just before the memory card horizontal writing external character recall command <K1>.
2. The error occurs when unused slot is specified.

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.17 Memory Card

Memory Card Vertical Writing External Character Recall

ESC+k1(k2)

Hexadecimal code	ESC	k1(k2)	Parameter
	$<1B>_{16}$	$<6B>_{16}<31>_{16}(<6B>_{16}<32>_{16})$	abbn~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Recall the external characters registered to memory card.

[Format]

<k1>an~n

<k2>an～n

●Parameter

a[External characters registration] = H : HEX character
B : Binary code
I : HEX character with smoothing function
C : Binary code with smoothing function
J : HEX character with highlight function
D : Binary code with highlight function
K : HEX character with smoothing and highlight function
E : Binary code with smoothing and highlight function

n~n [Registration code] = <GB18030 specification>
H, I, J, K : "8021" ~ "807F"
B, C, D, E : 8021H ~ 807FH
<BIG5/KSX1001 specification>
H, I, J, K : "9021" ~ "907F"
B, C, D, E : 9021H ~ 907FH

[Coding Example]

<A>
<V>100<H>100
<CC>1
<k1>H9021
<Q>2
<Z>

[Notes]

1. Make sure to specify the card slot command <CC> just before the memory card vertical writing external character recall command <k1>.
2. The error occurs when unused slot is specified.

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.18 Memory Card

Memory Card Initialization	ESC+BJF

Hexadecimal code	ESC	BJF	Parameter
	$<1B>_{16}$	$<42>_{16}<4A>_{16}<46>_{16}$	aaaaaaaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying the format (initialization) of memory card.

[Format]
<BJF>aaaaaaaa

●Parameter
a[User ID] = Specifying up to 8 bytes in alphanumeric and symbols

[Coding Example]
<A>
<CC>1
<BJF>satocard
<Z>

[Notes]
1. This command is not effective without an optional memory card.
2. Specify slot No. registered with Card Slot for Use <CC> prior to this command by all means.
3. The card will not be formatted and error occurs when the memory card is write-protect. The data is not guaranteed when the memory card is formatted accidentally. Be careful when formatting the memory card.
4. Initialization takes some time. Do not send any command until the initialization finishes.
5. When SD card is selected by the Card slot for use command <CC> and the SD card is formatted, the contents of the SD card are deleted all and then the printer creates folders necessary.

[Important]
Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.19 Memory Card

Print of Memory Card Status	ESC+BJS

Hexadecimal code	ESC	BJS	Parameter
	$<1B>_{16}$	$<42>_{16}<4A>_{16}<53>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Printing out the status of the memory card.

[Format]
<BJS>

[Coding Example]
<A>
<CC>1
<BJS>
<Z>

[Notes]
1. This command is for printing out the memory card status and it cannot be used in combination with other commands.
2. Status can be checked with the label of W68mm and H90mm.

[Important]
Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.20 Memory Card

Memory Card Clear

ESC+*

Hexadecimal code	ESC	*	Parameter
	$<1B>_{16}$	$<2A>_{16}$	a,bb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Clearing the entire contents in memory card (option).

[Format]
<*>a,bbb

●Parameter

a[Item to be cleared] = G : SATO Graphic
(Clearing graphic registered with Registration of Graphic <GI>)
P : PCX file
(Clearing PCX file registered with Registration of PCX File <PI>)
M : BMP file
(Clearing BMP file registered with Registration of BMP File <GT>)
F : Format
(Clearing format registered with Registration of Format <YS>)
O : True Type font
(Clearing True Type font registered with Registration of True Type Font <BJ>)
R : Form Overlay
(Clearing form overlay registered with Registration of Form Overlay <&S>)

b[Registration No.] = 000 to 099 (Omissible) True Type font
00001 to 99999(Omissible) Format
001 to 999 (Omissible) Other than above
(When omitting Registration No., all the registered data will be cleared.)

[Coding Example 1] Clearing 001 of SATO graphics
<A>
<CC1>
<*>G,001
<Z>

[Coding Example 2] Clearing 002 of PCX files
<A>
<CC1>
<*>P,002
<Z>

[Coding Example 3] Clearing Form Overlay entirely
<A>
<CC1>
<*>R
<Z>

[Notes]
1. Delimit Start of Data Transmission <A> and End of Data Transmission <Z> with this command for use.
2. Specify slot No. of Card Slot for Use <CC> prior to this command when using.

[Remark]
To clear all data of memory card, use Card Format <BJF>.

[Important]
Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.21 Memory Card

Registration of True Type Font

ESC+BJ ESC+BJD

Hexadecimal code	ESC	BJ BJD	Parameter
	$<1B>_{16}$	$<42>_{16}<4A>_{16}$ $<42>_{16}<4A>_{16}<44>_{16}$	(a...ab..b c...cdddde...e
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The registered data becomes valid.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Specifying the registration of True Type font.

[Format]
<BJ>(a...ab...b
<BJD>c...cdddde...e
<BJ>)

●Parameter

a[Font description]	Specification of 40 bytes font
b[Date]	10 bytes date data
c[Memory offset]	5 bytes memory offset (HEX specification)
d[No. of data bytes]	0001 to 9999
e[Font data to download]	

[Coding Example]
<A>
<CC>1
<BJ>(abcdefghijkabcdefghijkabcdefghijkabcdefghiik29-08-2000
<BJD>00000002203001A00490020・・・・・・・・・・0000000
<BJ>)
<Z>

[Note]
Specify slot No. registered with Card Slot for Use <CC> prior to this command by all means.

[Important]
Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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13.22 Memory Card

True Type Font Call

ESC+BJT

Hexadecimal code	ESC	BJT	Parameter
	$<1B>_{16}$	$<42>_{16}<4A>_{16}<54>_{16}$	,aa,bb,cc,dd,ee,ffff,n~n
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying to invoke True Type font.

[Format]

<BJT>,aa,bb,cc,dd,ee,ffff,n~n

●Parameter

a[Font ID]	:	00 to 99
b[Horizontal magnification]	:	01 to 12
c[Vertical magnification]	:	01 to 12
d[Character pitch]	:	01 to 99
e[Backup]	:	00 Fixed
f[No. of print character]	:	0000 to 9999
n[Data]		

[Coding Example]

```
<A>
<V>100<H>200<CC>1
<BJT>,01,02,02,01,00,0004SATO
<Q>
<Z>
```

[Note]

Specify slot No. registered with Slot Card for Use <CC> prior to this command by all means.

[Important]

Do not turn the printer power off when accessing to the memory. When the printer power is off while memory accessing, the data in the accessed media may be corrupted.

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14 Calendar command

14.1 Calendar

Calendar Setting	ESC+WT

Hexadecimal code	ESC	WT	Parameter
	$<1B>_{16}$	$<57>_{16}<54>_{16}$	aabbccddee
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Setting the calendar.

[Format]

<WT>aabbccddee

●Parameter

a[Year] = 00 to 99
b[Month] = 01 to 12
c[Date] = 01 to 31
d[Hour] = 00 to 23
e[Minute] = 00 to 59

[Coding Example] 2020, January 1, 13:13

<A>
<WT>2001011313
<Z>

[Notes]

1. Calendar IC is necessary for this command. This command cannot be used without a calendar IC.
2. When 00 to 80 is specified as the parameter a, 20 is applied to the upper 2 digits and the year is 20aa. When 81 to 99 is specified as the parameter a, 19 is applied to the upper 2 digits and the year is 19aa.

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14.2 Calendar

Calendar Addition

ESC+WP

Hexadecimal code	ESC	WP	Parameter
	$<1B>_{16}$	$<57>_{16}<50>_{16}$	abbb
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specifying the addition of the calendar.

[Format]

<WP>abbb

●Parameter

a[Specification of date and time] = Y : Year
M : Month
D : Date
h : Hour
W : Week No.

b[Specification of additional value for date and time] = Valid range for Y : 000 to 009
Valid range for M : 000 to 099
Valid range for D : 000 to 999
Valid range for h : 000 to 999
Valid range for W : 000 to 099
0 before the additional value can be omitted.

[Coding Example] Specifying and printing out the date that is three months from today.

```
<A>
<WP>M03
<V>100<H>200
<OB><WA>DD/MM/YY
<Q>2
<Z>
```

[Notes]

1. This command requires optional calendar IC. Note that the command cannot be used without the calendar IC.
2. This command can add certain period of time to the specified date of year, month, date, and time. As shown in the above [Coding Example], three months from today can be set.
3. The last <WP> become valid when there are multiple <WP> in 1 item.

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14.3 Calendar

Calendar Print

ESC+WA

Hexadecimal code	ESC	WA	Parameter
	$<1B>_{16}$	$<57>_{16}<41>_{16}$	a
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify calendar print.

[Format]

<WA>parameter

●Parameter

a[Print contents] =

YYYY(Year)	Valid range	:	1981-2080
YY(Year)	Valid range	:	00-99
Y(Year)	Valid range	:	0-9
MMM(Abbreviation of month)	Valid range	:	Jan-Dec
MM(Month)	Valid range	:	01-12
M(Month)	Valid range	:	A-Z,a-z
DDDDDDDDD(Day)	Valid range	:	Sunday-Saturday
DDD(Abbreviation of day)	Valid range	:	Sun-Sat
DD(Date)	Valid range	:	01-31
D(One character day code)	Valid range	:	-9,A-Z,a-z
HH(Hour)	Valid range	:	00-11
GG(Hour)	Valid range	:	01-12
hh(Hour)	Valid range	:	00-23
mm(Minuit)	Valid range	:	00-59
ss(Second)	Valid range	:	00-59
TT(Morning/Afternoon)	Valid range	:	AM/PM
JJJ(Julian Date)	Valid range	:	001-366
WW(Week)	Valid range	:	00-52
ww(Week)	Valid range	:	01-53
QQ(Hours/Minutes)	Valid range	:	01-96（1=15 minutes: 96=24 hours）
C(Shift code)	Valid range	:	1-3

[Coding Example] Print the date of 3 months later from the current date

```
<A>
<WP>M03
<V>100<H>200
<OB><WA>DD/MM/YYYY
<V>200<H>200
<OB><WA>hh:mm:ss TT
<V>300<H>200
<OB><WA>YY JJJ WW ww
<Q>2
<Z>
```

[Notes]

1. Calendar IC is necessary for this command. This command cannot be used without a calendar IC.
2. The printing is in real time when more than 2 QTY is specified.
3. Up to 6 calendar print commands can be specified in 1 form.
4. The maximum calendar print data is 16 characters.
5. WW(Week) of the parameter a is when the starting week is counted as 0, and ww(Week) is when the starting week is counted as 1. (Refer to the WW/ww command week examples below)
6. Specify the font type for calendar printing of the font command (refer to the available command below) before this command.
7. Do not use font type command <OA> and <OB> when printing MMM, M, DDDDDDDDD, DDD, and D of the parameter a. The lower case of the alphabet is not available with those fonts.

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WW/ww command week examples

Example 1) January 2008, the year that January 1st is Monday, Tuesday, Wednesday or Thursday

Mon	Tue	Wed	Thu	Fri	Sat	Sun
31	**1**	**2**	**3**	**4**	**5**	**6**
7	**8**	**9**	**10**	**11**	**12**	**13**
14	**15**	**16**	**17**	**18**	**19**	**20**
21	**22**	**23**	**24**	**25**	**26**	**27**
28	**29**	**30**	**31**	1	2	3

WW	ww
0th week	1st week
1st week	2nd week
2nd week	3rd week
3rd week	4th week
4th week	5th week

- When it is December 31st, 2007, 0th week is printed for WW(Week). (1st week is printed for ww(Week))
- When it is January 25th, 2008, 3rd week is printed for WW(Week). (4th week is printed for ww(Week))
- When it is January 28th, 2008, 4th week is printed for WW(Week). (5th week is printed for ww(Week))
- When it is February 3rd, 2008, 4th week is printed for WW(Week). (5th week is printed for ww(Week))

Example 2) January 2010, the year that January 1st is Friday, Saturday, and Sunday

Mon	Tue	Wed	Thu	Fri	Sat	Sun
28	29	30	31	**1**	**2**	**3**
4	**5**	**6**	**7**	**8**	**9**	**10**
11	**12**	**13**	**14**	**15**	**16**	**17**
18	**19**	**20**	**21**	**22**	**23**	**24**
25	**26**	**27**	**28**	**29**	**30**	**31**

WW	ww
52nd week	53rd week
0th week	1st week
1st week	2nd week
2nd week	3rd week
3rd week	4th week

- When it is January 1st, 2010, 25th week is printed for WW(Week). (53rd week is printed for ww(Week))
- When it is January 4th, 2010, 0th week is printed for WW(Week). (1st week is printed for ww(Week))

* The year which January 1st is Friday, Saturday, or Sunday, the second week of January is 0th week(1st week for ww(Week))

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The table below is the time when [QQ(Time)] parameter is set.

00:00 - 00:14	01	06:00 – 06:14	25	12:00 – 12:14	49	18:00 – 18:14	73
00:15 – 00:29	02	06:15 – 06:29	26	12:15 – 12:29	50	18:15 – 18:29	74
00:30 – 00:44	03	06:30 – 06:44	27	12:30 – 14:44	51	18:30 – 18:44	75
00:45 -:00:59	04	06:45 – 06:59	28	12:45 – 12:59	52	18:45 – 18:59	76
01:00 – 01:14	05	07:00 – 07:14	29	13:00 – 13:14	53	19:00 – 19:14	77
01:15 – 01:29	06	07:15 – 07:29	30	13:15 – 13:29	54	19:15 – 19:29	78
01:30 -:01:44	07	07:30 – 07:44	31	13:30 – 13:44	55	19:30 – 19:44	79
01:45 – 01:59	08	07:45 – 07:59	32	13:45 – 13:59	56	19:45 – 19:59	80
02:00 – 02:14	09	08:00 – 08:14	33	14:00 – 14:14	57	20:00 – 20:14	81
02:15 – 02:29	10	08:15 – 08:29	34	14:15 – 14:29	58	20:15 – 20:29	82
02:30 – 02:44	11	08:30 – 08:44	35	14:30 – 14:44	59	20:30 – 20:44	83
02:45 – 02:59	12	08:45 – 08:59	36	14:45 – 14:59	60	20:45 – 20:59	84
03:00 – 03:14	13	09:00 – 09:14	37	15:00 – 15:14	61	21:00 – 21:14	85
03:15 – 03:29	14	09:15 – 09:29	38	15:15 – 15:29	62	21:15 – 21:29	86
03:30 – 03:44	15	09:30 – 09:44	39	15:30 – 15:44	63	21:30 – 21:44	87
03:45 – 03:59	16	09:45 – 09:59	40	15:45 – 15:59	64	21:45 – 21:59	88
04:00 – 04:14	17	10:00 – 10:14	41	16:00 – 16:14	65	22:00 – 22:14	89
04:15 – 04:29	18	10:15 – 10:29	42	16:15 – 16:29	66	22:15 – 22:29	90
04:30 – 04:44	19	10:30 – 10:44	43	16:30 – 16:44	67	22:30 – 22:44	91
04:45 – 04:59	20	10:45 – 10:59	44	16:45 – 16:59	68	22:45 – 22:59	92
05:00 – 05:14	21	11:00 – 11:14	45	17:00 – 17:14	69	23:00 – 23:14	93
05:15 – 05:29	22	11:15 – 11:29	46	17:15 – 17:29	70	23:15 – 23:29	94
05:30 – 05:44	23	11:30 – 11:44	47	17 30 – 17:44	71	23:30 – 23:44	95
05:45 – 05:59	24	11:45 – 11:59	48	17:45 – 17:59	72	23:45 – 23:59	96

[Valid Commands]

Print position	<V>	<H>								
Modification	<L>	<%>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>			
	<U>	<S>	<M>	<WB>	<WL>	<$=>				

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14.4 Calendar

Extended Calendar Print

ESC+WU

Hexadecimal code	ESC	WU	Parameter
	$<1B>_{16}$	$<57>_{16}<55>_{16}$	a
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify calender print.

[Format]

<WU>a

●Parameter

a[Print contents] =

YYYY(Year)	Valid range	:	1981-2080
YY(year)	Valid range	:	00-91
Y(year)	Valid range	:	0-9
MMM(Abbreviation of month)	Valid range	:	Jan-Dec
MM(Month)	Valid range	:	01-12
M(Month)	Valid range	:	A-Z,a-z
DDDDDDDDD(Day)	Valid range	:	Sunday-Saturday
DDD(Abbreviation of day)	Valid range	:	Sun-Sat
DD(Date)	Valid range	:	01-31
D(one character day code)	Valid range	:	0-9,A-Z,a-z
HH(Hour)	Valid range	:	00-11
GG(Hour)	Valid range	:	01-12
hh(Hour)	Valid range	:	00-23
mm(Minuit)	Valid range	:	00-59
ss(Second)	Valid range	:	00-59
TT(Morning/Afternoon)	Valid range	:	AM/PM
JJJ(Julian Date) Valid range	:	001-366	
WW(Week)	Valid range	:	00-52
ww(Week)	Valid range	:	01-53
QQ(Time)	Valid range	:	01-96（1=15 minutes: 96=24 hours）
C(Shift code)	Valid range	:	1-3
Control code	>Z...>Z		

[Coding Example] Print the date of 3 months later from the current date

```
<A>
<WP>M03
<V>100<H>200
<OB><WU>>ZDD/MM/Yyhh:mm>Z
<Q>2
<Z>
```

[Coding Example] Print "DATE" and the current date

```
<A>
<V>100<H>200
<OB><WU>DATE:>ZDD/MM/Yyhh:mm>Z
<Q>2
<Z>
```

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[Notes]

1. Calendar IC is necessary for this command. This command cannot be used without a calendar IC.
2. The printing is in real time when more than 2 QTY is specified.
3. Up to 6 calendar print commands can be specified in 1 form.
4. The maximum calendar print data is 16 characters.
5. WW(Week) of the parameter a is when the starting week is counted as 0, and ww(Week) is when the starting week is counted as 1.
   (Refer to the WW/ww command week examples for calendar print <WA>below)
6. Specify the font type for calendar printing of the font command (refer to the available command below) before this command.
7. Do not use font type command <OA> and <OB> when printing MMM, M, DDDDDDDDD, DDD, and D of the parameter a. The lower case of the alphabet is not available with those fonts.
8. Use the control command >Z in a pair at before and after the parameter. When it is not used in a pair, it will be recognized as text.
9. When there is return or line feed (<0D>$_{16}$, <0A>$_{16}$) in between >Z...>Z, it is not recognized as a pair.
10. When printing >Z, put >JZ instead of >Z.
11. When calendar is used as a parameter for barcode, according to the specifications of barcode. For example, it is not possible to specify other than numeric data with GS1-128(UCC/EAN128), therefore MMM cannot be specified as the parameter a.
12. Refer to calendar print<WA> for QQ(Time) of the parameter a.

[Valid Commands]

Print position	<V>	<H>								
Modification	<L>	<%>								
Font	<XU>	<XS>	<XM>	<XB>	<XL>	<OA>	<OB>			
	<U>	<S>	<M>	<WB>	<WL>					
Barcode	<B>	<BC>	<BG>	<BI>	<D>	<D><d>	<BD>	<BT>	<BW>	
	<BP>	<BF>	<BS>	<BL>	<BL><d>	<BM>	<$=>			

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14.5 Calendar

Calender Case Format

ESC+WV

Hexadecimal code	ESC	WV	Parameter
	$<1B>_{16}$	$<57>_{16}<56>_{16}$	a
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made
	Valid range between item	The set parameter is in effect until a new specification is made

[Function]

Specify the alphabet case of calendar "MMM" and "Mmm".

[Format]

<WV>a

●Parameter

a[Case format] = 0 'MMM','DDD','DDDDDDDDD' : Upper case and lower case mixed format(e.g. Jan, Mon, Monday...)

1 'MMM','DDD','DDDDDDDDD' : Upper case format(e.g. JAN, MON, MONDAY)

[Coding Example]

<A>

<WV>1

<Z>

[Notes]

The list below is indicating display for the data format code 'MMM', 'DDD', and 'DDDDDDDDD'.

Format code'MMM'

Month	Case format = 0	Case format = 1
January	Jan	JAN
February	Feb	FEB
March	Mar	MAR
April	Apr	APR
May	May	MAY
June	Jun	JUN
July	Jul	JUL
August	Aug	AUG
September	Sep	SEP
October	Oct	OCT
November	Nov	NOV
December	Dec	DEC

Format code'DDD'

Day	Case format = 0	Case format = 1
Sunday	Sun	SUN
Monday	Mon	MON
Tuesday	Tue	TUE
Wednesday	Wed	WED
Thursday	Thu	THU
Friday	Fri	FRI
Saturday	Sat	SAT

Format code'DDDDDDDDD'

Day	Case format = 0	Case format = 1
Sunday	Sunday	SUNDAY
Monday	Monday	MONDAY
Tuesday	Tuesday	TUESDAY
Wednesday	Wednesday	WEDENSDAY
Thursday	Thursday	THURSDAY
Friday	Friday	FRIDAY
Saturday	Saturday	SATURDAY

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14.6 Calendar

Calendar M(Month) and D(Day)	ESC+CV

Hexadecimal code	ESC	CV	Parameter
	$<1B>_{16}$	$<43>_{16}<56>_{16}$	a,b,c,d,e,f,g,h,i,j,k,l,m
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is maintained.
	Valid range within item	The set parameter is in effect until a new specification is made
	Valid range between item	The set parameter is in effect until a new specification is made

[Function]

Specify the month code or day code in 1 character.

[Format]

<CV>a,b,c,d,e,f,g,h,i,j,k,l,m

●Parameter

a[Set Month or Day code] = Valid range: M or D
b[Month code for January/Day code for Sunday] = Valid range: Month: A-A, a-z(Default:A), Day: 0-9, A-Z, a-z(Default:1)
c[Month code for February/Day code for Monday] = Valid range: Month: A-A, a-z(Default:B), Day: 0-9, A-Z, a-z(Default:2)
d[Month code for March/Day code for Tuesday] = Valid range: Month: A-A, a-z(Default:C), Day: 0-9, A-Z, a-z(Default:3)
e[Month code for April/Day code for Wednesday] = Valid range: Month: A-A, a-z(Default:D), Day: 0-9, A-Z, a-z(Default:4)
f[Month code for May/Day code for Thursday] = Valid range: Month: A-A, a-z(Default:E), Day: 0-9, A-Z, a-z(Default:5)
g[Month code for June/Day code for Friday] = Valid range: Month: A-A, a-z(Default:F), Day: 0-9, A-Z, a-z(Default:6)
h[Month code for July/Day code for Saturday] = Valid range: Month: A-A, a-z(Default:G), Day: 0-9, A-Z, a-z(Default:7)
i[Month code for August] = Valid range: Month: A-Z, a-z(Default:H)
j[Month code for September] = Valid range: Month: A-Z, a-z(Default:J)
k[Month code for October] = Valid range: Month: A-Z, a-z(Default:K)
l[Month code for November] = Valid range: Month: A-Z, a-z(Default:L)
m[Month code for December] = Valid range: Month: A-Z, a-z(Default:M)

[Coding Example]

<A>
<CV>,D,S,M,T,W,R,F,Z
<Z>

[Notes]

1. The default is used when the month code is omitted.
   e.g.)The month code is set as X, B, C, D, E, F, G, H, J, K, L, Y with <CV>,M,X,,,,,,,,,Y
2. The default is used when the day code is omitted.
   (e.g. The day code is set as X, 2, 3, 4, 5, 6, Y with <CV>,D,X,,,,,Y)
3. The default is used when invalid month code is specified.
   e.g.) The month code is set as M, N, O, P, E, R, S, T, U, V, W, X with <CV>,M,M,N,O,P,#,R,S,T,U,V,W,X
4. The default is used when invalid day code is specified.
   e.g.) The day code is set as A, B, C, 4, E, G with <CV>,D,A,B,C,#,E,F,G

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15 Intelligent Command

15.1 Intelligent Command

Media Feed Control	ESC+IK

Hexadecimal code	ESC	IK	Parameter
	$<1B>_{16}$	$<49>_{16}<4B>_{16}$	a(,bbbb)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

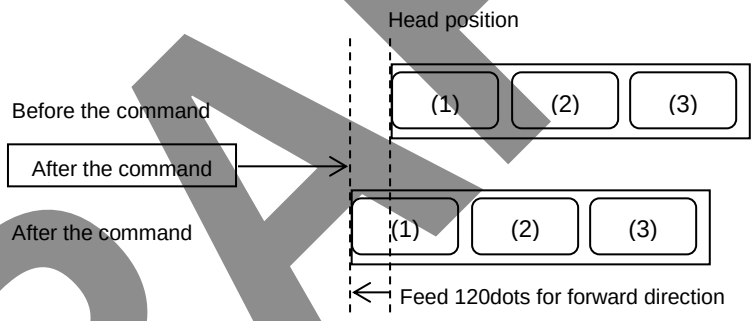
[Function]
Feed or backfeed the media for the specified length.

[Format]
<IK>a(,bbbb)

●Parameter

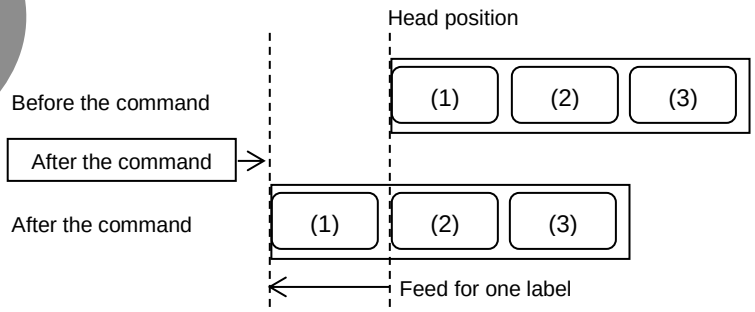
a[Feed direction]	=	0	:	Forward direction
		1	:	Backward direction
b[Feed length]	=	Valid range:		Refer to the table on the next page (Omissible for forward direction)
				One label will be fed when this parameter is omitted.

[Coding Example 1]
<A>
<IK>0,120
<Z>



The printing starts from the current position when print data are received without returning to the original position with <IK>1,120.

[Coding Example 2] Feed for one label
<A>
<IK>0
<Z>



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[Notes]

1. Use this command in between Start of Data Transmission <A> and End of Data Transmission <Z>. This command is disabled when this is specified in the item with print data.
2. Do not specify too long feed distance for backward direction. When too long distance is specified in the backward direction, printing may be overlapped or the media fell off from the platen roller and the paper end error may be falsely detected.
3. Do not specify the feed length of the backward position for more than 30mm when the print method is thermal transfer. The command error occurs due to the possibility of ribbon end false detection. Furthermore, do not specify the media feed command for the backward direction continuously.
4. Do not specify the media feed command for backward direction just after dispensed label in dispense mode.
5. The feeding speed is fixed for 4inches/sec when media feed length is specified.
6. The operation of the printer when the feeding length is omitted for forward direction is the same as the media feed when FEED key is pressed while the printer is offline.
7. The media feeding by this command is done when the printer is online.
8. Control of feeding is not available by the external signal.
9. The command error occurs when the feeding length is omitted with backward direction.
10. The media feed by <IK>0(feeding length is omitted) cannot be done when the sensor is ignored in the continuous printing mode.
11. The command error occurs when the feeding length is out of range.
12. Note that the printing may be overlapped according to the feed length of backward direction.
13. The accuracy may vary depending on the printer, used media and environment. Adjust the feeding length when using.

[Valid range (For forward direction)]

[S84-ex]

Head density	Valid range(dots)
8dots/mm (203 dpi)	48 - 1600
12dots/mm (305 dpi)	72 - 2400
24dots/mm (609 dpi)	144 - 4800

[S86-ex]

Head density	Valid range(dots)
8dots/mm (203 dpi)	48 - 1600
12dots/mm (305 dpi)	72 - 2400

[Valid range (For backward direction)]

[S84-ex]

Head density	Valid range(dots)
8dots/mm (203 dpi)	48 - 240
12dots/mm (305 dpi)	72 - 360
24dots/mm (609 dpi)	144 - 720

[S86-ex]

Head density	Valid range(dots)
8dots/mm (203 dpi)	48 - 240
12dots/mm (305 dpi)	72 - 360

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15.2 Intelligent Command

Displayed Messages

ESC+IM

Hexadecimal code	ESC	IM	Parameter
	$<1B>_{16}$	$<49>_{16}<4D>_{16}$	a(,bbb･･･b)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Specify the messages to be displayed while the printer is online, normal mode.
The maximum 16 digits alphanumeric and symbols can be specified.

[Format]

<IM>a(,bbb･･･b)

●Parameter

a[]Switching of display/no display = 0 : No display
1 : Display on the upper row
2 : Display on the lower row

b[Displayed message] = Displayed range : Alphanumeric and symbols(20H-7EH of ASCII) 16 digits
This parameter can be omitted for no display.

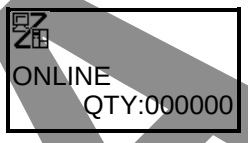
[Coding Example 1] Change the display of the upper row

<A>
<IM>1,FORMAT01

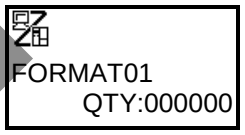
Print Data

<Q>100
<Z>

Before the



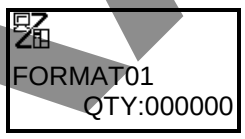
After the



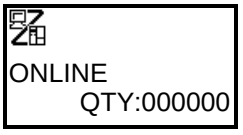
[Coding Example 2] Return back the displayed message

<A>
<IM>0
<Z>

Before the



After the



[Notes]

1. The displayed message is returned back to the normal display after the printer power off.
2. When a specified message is exceeded the maximum digit, the message within the valid digit is displayed.
3. The message is left aligned and when the message is less than the maximum display digit(16 digits), space(20H) is filled.
4. The message will not be changed when the displayed data are omitted.
5. The specified message is displayed only in the normal mode, online state. It is not displayed in the offline state and error state.
6. Invalid code in the displayed data will be replaced with space(20H) and displayed.
7. The printer will process it as the control code when control codes(00H-1FH) are included in the display data. Do not specify any control code in the display data to prevent the printer false operation.
8. The printing quantity display during the printing is not displayed when message display is specified in the lower row.

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15.3 Intelligent Command

Internal Buffer Registration

ESC+IF

Hexadecimal code	ESC	IF	Parameter
	$<1B>_{16}$	$<49>_{16}<46>_{16}$	aa,bb,cc(,ddd･･･d)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Store the specified data in the internal buffer.
It is possible to store up to 32 digits for 16 blocks in the internal buffer(RAM).
The stored data can be recalled by the data acquisition command <IB> and use them as the print data.

[Format]

<IF>aa,bb,cc(,ddd･･･d)

●Parameter

a[Internal buffer number] = Valid range : 1 ～ 16
b[Input digit] = Valid range : 1 ～ 32
c[Data] = For the digit specified by the parameter b(any code can be specified)
d[Data item name] = Valid range : Only alphanumeric and symbols 16 digits(omissible)

[Coding Example]

<A>
<IF>1,2,49,DATA1
<IF>2,6,123456,DATA2
<IF>3,4,1234,DATA3
<IF>6,4,0010,QTY
<Z>

Internal buffer

No	Item name	Number of digits	Data contents
01	DATA1	2	49
02	DATA2	6	123456
03	DATA3	4	1234
04		0	
05		0	
06	QTY	4	0010
07		0	
08		0	
09		0	
10		0	
11		0	
12		0	
13		0	
14		0	
15		0	
16		0	

[Notes]

1. The stored data is cleared when the printer power is off.
2. The item name will not be changed when [Data item name] parameter is omitted.
3. Only for the available digit of the data from the start will be stored when the specified number of data exceeded the input digit.
   Note that the data exceeded the available digit are not maintained.
   e.g.) <IF>1,5,12345678 -> only 5 digit data "12345" is stored
4. When the data are less than the input digit, following parameter or command sequence become the buffer input data and it will not operate normally.
   e.g.) <IF>1,5,456,DATA1 -> 5 digit data "456,D" is stored and nothing will be stored for the item name.
5. When specified already stored internal buffer number, the stored data is overwritten and stored in the buffer.

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15.4 Intelligent Command

Internal Buffer Recall

ESC+IB

Hexadecimal code	ESC	IB	Parameter
	$<1B>_{16}$	$<49>_{16}<42>_{16}$	aa(,aa,aa･･･)
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Recall the data stored in the internal buffer to be used as character strings or print data for the barcode.

[Format]

<IB>aa(,aa,aa･･･)

●Parameter

a[Internal buffer number] = Valid range : 1 ～ 16

It is possible to combine multiple data by delimiting with comma and specifying them.

[Coding Example] Print JAN13 by using the internal buffer data

Original data

<A>
<V>100<H>100
<IB>1,2,3
<BD>304120
<IB>6
<Q>
<Z>

Data after processing

<A>
<V>100<H>100
<BD>304120**491234561234**
<Q>**0010**
<Z>

The registered data 1, 2, and 3 are combined and used as the barcode data in the above example.

Internal buffer			
No	Item name	Number of digits	Data contents
01	DATA1	2	49
02	DATA2	6	123456
03	DATA3	4	1234
04		0	
05		0	
06	QTY	4	0010
07		0	
08		0	
09		0	
10		0	
11		0	
12		0	
13		0	
14		0	
15		0	
16		0	

[Notes]

1. The stored data is cleared when the printer power is off.
2. Refer to the table on the next page for the command that can be replaced for the print data and parameters.
3. Specify the internal buffer recall command <IB> before the command replaced for the data.
4. The internal buffer recall command <IB> is valid only when the data and parameter of the command to be replaced are not specified. The replacement of data by the internal buffer data recall command <IB> will not be done when parameter is specified for the command to be replaced.
5. The maximum 1024 bytes of the internal buffer data for one time can be recalled.
6. It is possible to specify the same internal buffer number repeatedly in the command.

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Table of command that can be specified as parameter

Classification	Command	Command name	The parameter can be replaced (underlined part)
Font	<XU>	XU font	<XU>**n～n**
	<XS>	XS font	<XS> **n～n**
	<XM>	XM font	<XM> **n～n**
	<XB>	XB font	<XB>1**n～n** * Smoothing is fixed to valid
	<XL>	XL font	<XL>1**n～n** * Smoothing is fixed to valid
	<OA>	OCR-A font	<OA>**n～n**
	<OB>	OCR-B font	<OB>**n～n**
	<$=>	Outline font print	<$=>**n～n**
	<RD>	CG font	<RD>abb,ccc,ddd,**n～n**
Barcode	<B>	Barcode(Ratio 1:3)	<B>abbccc**n～n**
	<D>	Barcode(Ratio 1:2)	<D>abbccc**n～n**
	<D><d>	Barcode(HRI selection)	<D>abbccc**n～n** <D>**n～n**
	<BD>	Barcode(Ratio 2:5)	<BD>abbccc**n～n**
	<BW>	Barcode print by ratio registration	<BW>aabbb**n～n**
	<BI>	Exclusive for standard carton ID GS1-128 (UCC/EAN)	<BI>aabbbc**n～n**
	<BC>	CODE93	<BC>aabbbcc**n～n**
	<BG>	CODE128	<BG>aabbb**n～n**
	<BZ>	Customer barcode	<BZ>**nnnnnnn,n～n**
	<BF>	Bookland	<BF>aabb**n～n**
	<BP>	POSTNET	<BP>**n～n**
	<BL>	UPC-A barcode (without HRI)	<BL>abbccc**n～n**
	<BL><d>	UPC-A barcode (HRI)	<BL>abbccc**n～n** <d>**n～n**
	<BM>	UPC-A barcode (with HRI)	<BM>abbccc**n～n**
2D code	<2D10>	PDF417	<DN>aaaa,**n～n**
	<2D12>	MicroPDF417	<DN>**n～n** * Only when binary mode is 0=Normal.
	<2D20>	MaxiCode	<DN>aaaa,**n～n**
	<2D30>	QR code (model 2)	<DS>k,**n～n** <DN>aaaa,**n～n**
	<2D31>	QR code (model 1)	<DS>k,**n～n** <DN>aaaa,**n～n**
	<2D32>	Micro QR code	<DS>k,**n～n** <DN>aaaa,**n～n**
	<2D33>	SQR code	<DS>k,**n～n** <DN>aaaa,**n～n**
	<2D50>	DataMatrix (ECC200)	<DN>aaaa,**n～n**
	<2D51>	GS1 DataMatrix (ECC200)	<DN>aaaa,**n～n**
	<BQ>	QR code	<BQ>abcc,(ddeeff,)g(hhhh)**n～n** <BQ>abcc,(ddeeff,)**n～n**
	<BV>	MaxiCode	<BV>a,b,c,ddddddddd,eee,fff,**n～n**
	<BK>	PDF417	<BK>aabbcddeeffff**g～g**,h
	<DC>	DataMatrix (ECC200) data	<BX>aabbccddeeefffghh <DC>**n～n**
Control	<Q>	Print quantity	<Q>**n～n**
Intelligent	<IT>	Data sending form	<IT>aa,bb,**n～n**

[Important]

There are restrictions as follows with QR code, manual mode mixed:

- It is possible to replace normally when number of mix=1
- When the number of mix is bigger than 1, the print data that is acquired by the internal buffer recall command that is specified before the QR code print command will be specified for replace for the number of mix.
- Recommend to use in auto mode when replacing the print data by internal buffer recall command.

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15.5 Intelligent Command

Internal Buffer Data

ESC+IC

Hexadecimal code	ESC	IC	Parameter
	$<1B>_{16}$	$<49>_{16}<43>_{16}$	a,bb,cc
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Compare the stored data in the internal buffer.
The data after this command will be analyzed when the comparison result is the same as the parameter a(Match/Mismatch).
The data after this command until the data end <Z> will be invalid when the comparison result is not the same as the parameter a(Match/Mismatch).

[Format]

<IC>a,bb,cc

●Parameter

a[Comparison result] = Valid range : 0 Match
: 1 Mismatch

b[Internal buffer number(original)] = Valid range : 1 ～ 16

c[Internal buffer number(to be compared)] = Valid range : 1 ～ 16

[Coding Example]

<A>
<IC>0,01,02
<V>100<H>400<L>0404<XM>,OK
<Q>1
<Z>

Comparison

Internal buffer			
No	Item name	Number of digits	Data contents
01	DATA1	5	12345
02	DATA2	5	12345
03	DATA3	8	12345678
04		0	
.	.	.	.
.	.	.	.
.	.	.	.
16		0	

Result)

The below label will be printed when the data are the same.

OK

The label will not be printed when the data is not the same.

[Note]

The command error occurs when the parameter is in invalid range and the comparison of the internal buffer data will not be done.

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15.6 Intelligent Command

Internal Buffer Data Print

ESC+I*

Hexadecimal code	ESC	I*	Parameter
	$<1B>_{16}$	$<49>_{16}<2A>_{16}$	Nil
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Print the stored data in the internal buffer.

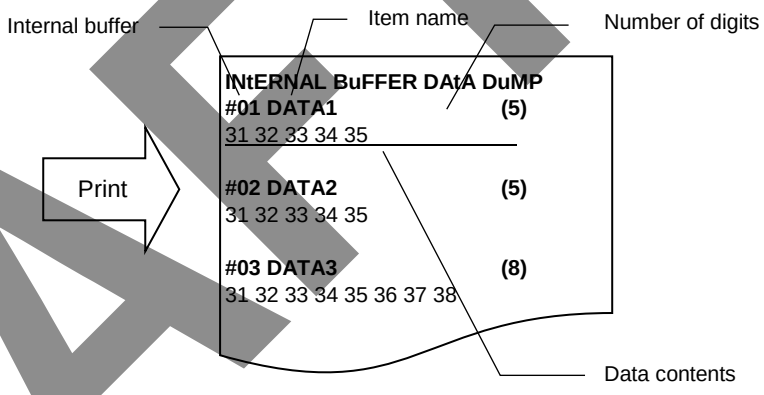
[Format]

<I*>

[Coding Example]

<A>
<I*>
<Z>

Internal buffer			
No	Item name	Number of digits	Data contents
01	DATA1	5	12345
02	DATA2	5	12345
03	DATA3	8	12345678
04		0	
. . .	. . .	. . .	. . .
16		0	



[Note]

Use this command in between Start of Data Transmission <A> and End of Data Transmission <Z>.

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15.7 Intelligent Command

Exclusive Key Start-End

ESC+I#

Hexadecimal code	ESC	I#	Parameter
	$<1B>_{16}$	$<49>_{16}<23>_{16}$	a
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The set parameter is in effect until a new specification is made.
	Valid range between item	The set parameter is in effect until a new specification is made.

[Function]

Disable the normal key input temporally and user can specify key exclusively.
The key operation information is stored to the key buffer during the exclusive key function.
The information stored in the key buffer can be acquired by the key information acquisition command [SOH+KI].

[Format]

<I#>a

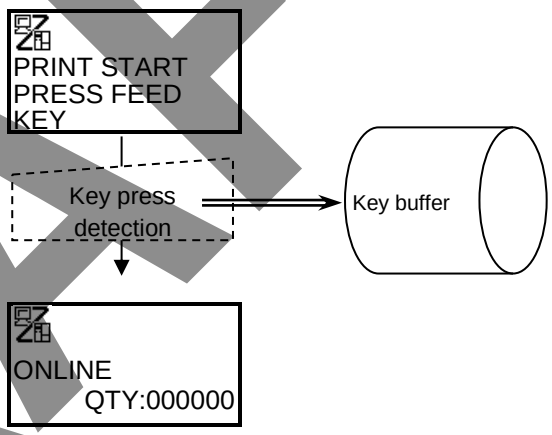
●Parameter

a[Exclusive key start-end switch] = Valid range : 1 Start exclusive key
0 End exclusive key

[Coding Example]

<A>
<I#>1
<IM>1,PRINT START
<IM>2,PUSH FEED KEY
<Z>

(Possible to acquire with the key information acquisition command [SOH+KI])



<A>
<I#>0
<IM>1
<Z>

(Possible to acquire with the key information acquisition command [SOH+KI])

[Notes]

1. This command is valid only in the online mode.
2. The size of the key buffer is 1KB. The maximum 512 inputs can be maintained because 2bytes are used with one key information.
3. The key buffer is a ring buffer. When the key input is stored above the maximum item, the oldest information will be overwritten.
4. The key buffer is initialized when start exclusive key with this command.
5. The key buffer is not initialized when end exclusive key with this command. Thus, it is possible to acquire the key information when exclusive key is ended.
6. Label printing and printer error detection are done normally when the exclusive key use has started.
7. The exclusive key use is temporarily release when an error occurs, and back to exclusive key use when the printer is in online state after recovering from the error.
8. The default after the printer power on is not exclusive use.
9. The key input command <IZ> is disabled when the exclusive key use is on.

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10. The specification of key information acquisition command is as follows.

(1) Command

SOH + KI (01H 4BH 49H)

(2) Return Status

[STX] + number of key information + key information string + [ETX]

1) Number of key information

Indicate the following number of key information.

Number of key information is equal to the number of key pressing detection.

The information is stored in ASCII, binary and 5 bytes.

0	1	2	3	4
The ten-thousands place	The thousands place	The hundreds place	The tens place	The ones place

- ●Displayed in the numeric character from "00000" to "99999."
- ●The information is notified in 5 digits even the key press detection is less than 5 digits by filling 0 at the beginning.

2) Key information string

The all key information is notified consecutively.

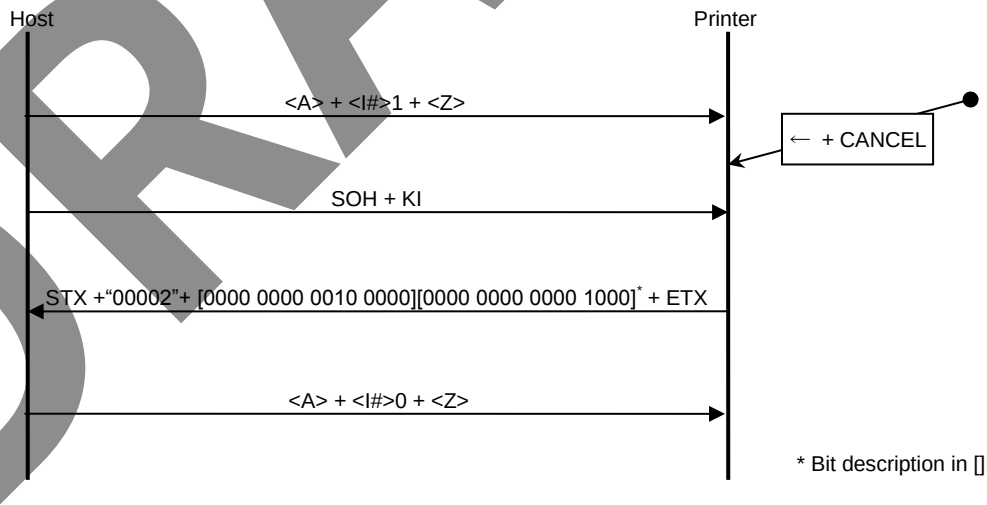
One key information is consist with 2 bytes binary value.

NO.	Item	Description	Number of bytes
1	Key information	Key press information Output the ON/OFF status of the key to the bit corresponding to the key. (Refer to the table below for the bit corresponding to the key) 0: Key is released 1: Key is pressed	2

The bit corresponding to the key (2 bytes)

BIT15	BIT14	BIT13	BIT12	BIT11	BIT10	BIT9	BIT8	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0
0	0	0	0	0	0	0	FUNCTION	↓	↑	←	→	CANCEL	ENTER	LINE	FEED

3) Acquired sequence



2. The key information stored in the key buffer can be cleared by key buffer initialization command.

(1) Command

SOH + KC (01H 4BH 43H)

(2) Return Status

「STX」+ 0 + 「ETX」 (02H 30H 03H)

0 is fixed.

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15.8 Intelligent Command

Key Input	ESC+IZ

Hexadecimal code	ESC	IZ	Parameter
	$<1B>_{16}$	$<49>_{16}<5A>_{16}$	aa,bb,cc,ddd･･･d
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Store the data input from the operation panel to the internal buffer.
Change the data with ↑ ↓ keys and move the cursor with ←→ keys.
Fix the input value with the ENTER key and store it in the internal buffer. The display transit in this state.
It is possible to store input data up to 32 digits for 16 blocks in the internal buffer(RAM).
The stored data can be recalled by the internal buffer acquisition command <IB> and use them as the print data.

[Format]

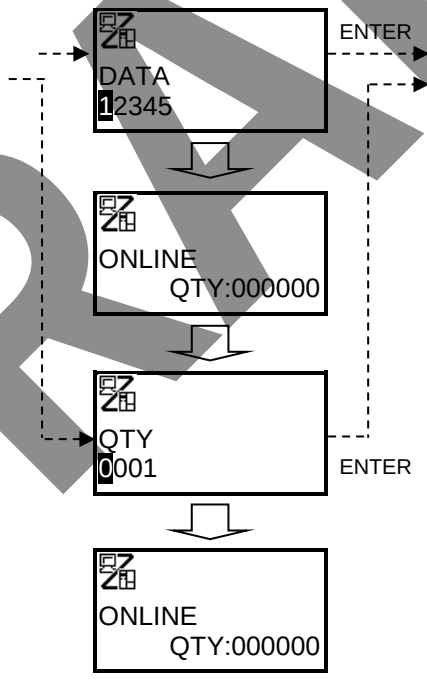
<IZ>aa,bb,cc,ddd･･･d

●Parameter

a[Internal buffer number] = Valid range : 1 ～ 16
b[Input digit] = Valid range : 1 ～ 32
c[Default data] = For number of digits specified by b (Display available range: ASCII 20H-7EH)
d[Data item name] = Valid range : Only alphanumeric and symbols 16 digits

[Coding Example]

<A>
<IZ>1,5,12345,DATA
<IZ>2,4,0001,QTY
<Z>



Internal buffer

No	Item name	Number of digits	Data
01	DATA	5	12345
02	QTY	4	0001
03		0	
04		0	
05		0	
06		0	
07		0	
08		0	
09		0	
10		0	
11		0	
12		0	
13		0	
14		0	
15		0	
16		0	

[Notes]

1. The stored data is cleared when the printer power is off.
2. The input data is displayed up to 16 digits. When the data exceeded 16 digits, display the data with ←→ key scrolling.
3. The printer returns back to the original display after input.
4. Data input and message display is only available in the online state. Data input is not available when offline state and error state.
5. The message is left aligned and when the message is less than the maximum display digit(16 digits), space$<20>_{16}$ is filled.
6. The moving range by ←→ keys for input cursor depends on the input digit specification.
7. Invalid code in the displayed data will be replaced with space$<20>_{16}$ and displayed.
8. The code can be changed by ↑ ↓ keys is $<20>_{16}$～$<7E>_{16}$ in ASCII.
9. It is not possible to change by key input when control code($<00>_{16}$～$<1F>_{16}$ in ASCII) is included in the default data. Even the code has been changed by input cursor, the applicable code is discarded when storing to the internal buffer.
10. The command error occurs when input digit and the number of default data is not consistent.
11. The error will not be occurred even a printer error is detected during input waiting.
12. This command is invalid when the keys are used exclusively by <I#>1.

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15.9 Intelligent Command

Internal Buffer Registration (Received Data)

ESC+IR

Hexadecimal code	ESC	IR	Parameter
	$<1B>_{16}$	$<49>_{16}<52>_{16}$	aa,bb(,cccc)(,d)(,eeee)(,ffffff)(,gggg…g)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Acquire received data from the sub port.
It is possible to store acquired data up to 32 digits for 16 blocks in the internal buffer(RAM).
The stored data can be recalled by the data acquisition command <IB> and use them as the print data.

[Format]

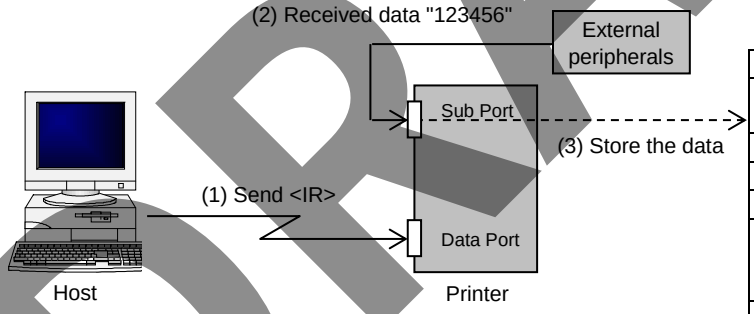
<IR>aa,bb(,cccc)(,d)(,eeee)(,ffffff)(,gggg・・・g)

●Parameter

a[Internal buffer number] = Valid range : 1 ～ 16
b[Acquired digit] = Valid range : 1 ～ 32
c[Received data import start position] = Valid range : 0 ～ 9999 (Omissible)
d[Digit of terminate code] = Valid range : 1 ～ 4 (Omissible)
e[Terminate code] = No code range specification, 4 digits (Omissible)
f[Timeout time] = Valid range : 0 ～ 999999(1=5ms) (Omissible)
When this parameter is omitted, the printer will not be proceeded to the next command analysis until data for specified digit are received.
g[Data item name] = Valid range : Only alphanumeric and symbols 16 digits(omissible)

[Coding Example 1] Store the received 6 byte data to the internal buffer
(Start code, terminate code, time out time and data item name are omitted)

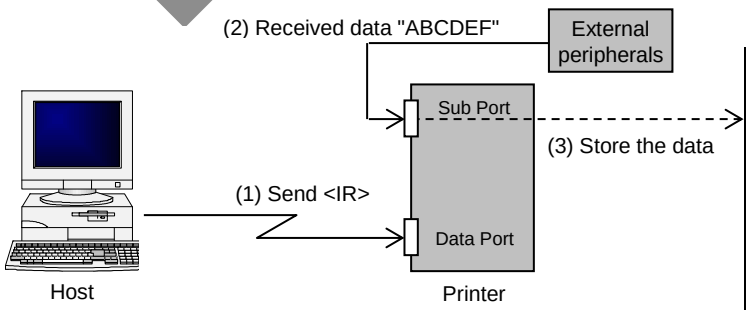
<A>
<IR>1,6
<Z>



Internal buffer			
No	Item name	Number of digits	Data
01		6	123456
02		0	
03		0	
. . .	. . .	. . .	. . .
16		0	

[Coding Example 2] Store the received 6 bytes data to the internal buffer
(Start position and terminate code are omitted)

<A>
<IR>1,6,,,,1000,ITEM__CODE
<Z>

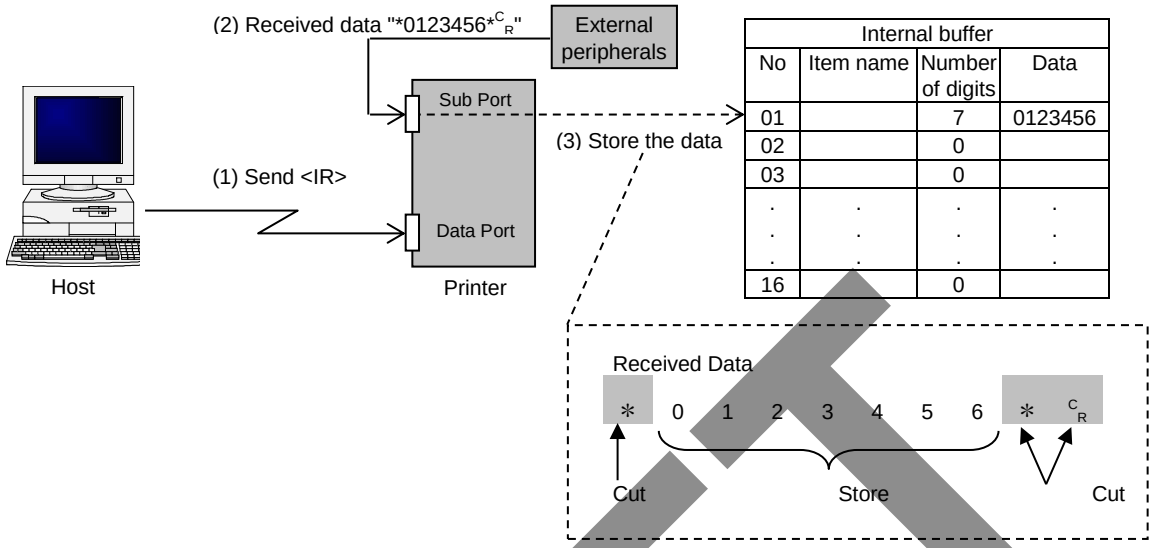


Internal buffer			
No	Item name	Number of digits	Data
01	ITEM_CODE	6	ABCDEF
02		0	
03		0	
. . .	. . .	. . .	. . .
16		0	

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[Coding Example 3] Store the data by specifying the import start position and terminate code
(Timeout time and data item name are omitted)

<A>
<IR>1,32,1,2,*$^{C}_{R}$
<Z>



* Use this method when there are data that you wish to discard at before and after the received data.
* Either of the import start position and terminate code specification can be omitted. Also, both can be specified at the same time.
* Specify the maximum 32 digits for the acquired digit when digits to be received is unknown.

[Notes]

1. The stored data is cleared when the printer power is off.
2. Do not use this command together with the print data.
3. The data that exceeds the specified digit are not stored in the internal buffer.
4. The allocation of the data port and sub port is according to the setting in the interface mode.
5. Enable the setting of the sub port on the LCD in advance to be able to acquire output data of external peripheral with this command.
6. The data receive waiting status of this command can be released with the following cancel the operation.
   (1) Send CAN to the data port
   (2) Print job cancel by LCD menu operation (OFFLINE-> CANCEL-> YES-> ENTER)
7. Note that 00_{16} is specified as terminate code for the specified digit when terminate code is specified and terminate code itself is omitted.
8. The time out time is waiting time for 1 byte receive data. Thus, the monitoring time is cleared at every 1 byte receive, and wait for the specified time again for receive. This is repeated for the specified receive digits.
9. When the time to receive is out, store the received byte to the internal buffer and stop the command operation. The digit item in the internal buffer will be the actual received bytes, not the specified digits.
10. When the time to receive is out, the command finishes normally even the data are not enough for the specified receive data.
11. When the command finished due to the receive timeout while receiving terminate code, already received terminate code may be stored in the internal buffer. In this case, set longer timeout time.
12. When received data are less than the specified [acquire digit], the printer will wait receiving for the specified [timeout time].
13. When the received data are more than the [acquire digit], the data for the acquire digit are stored in the internal buffer and rest are remained in the receive buffer. These can be stored in the internal buffer by using <IR> again.

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15.10 Intelligent Command

Data Sending

ESC+IT

Hexadecimal code	ESC	IT	Parameter
	$<1B>_{16}$	$<49>_{16}<54>_{16}$	a,b[,cccc,ddd･･･d]
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Send data to the specified port.
The maximum data for sending is 1024 bytes.

[Format]

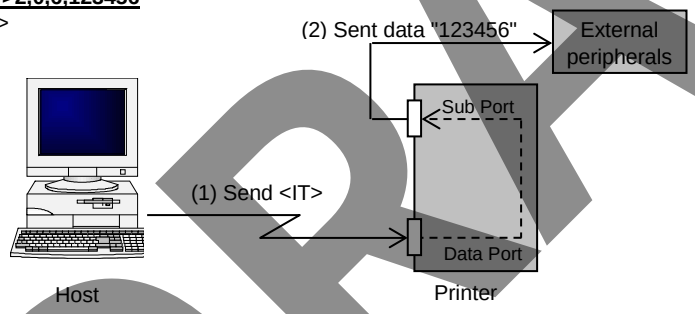
<IT>a,b,cccc,ddd･･･d

●Parameter

a[Port to be sent]	=	1	:	Data port
		2	:	Sub port
b[Sending text format]	=	0	:	No additional code
		1	:	Add STX(02H) at the beginning and ETX(03H) at the ending
		2	:	Add CRLF(0D0AH) at the ending
		3	:	Add CR(0DH) at the ending
c[Sending digit]	=	Valid range	:	1 ～ 1024
d[Data to be sent]	=	Valid range	:	For the digits specified by c, no limitation for code range

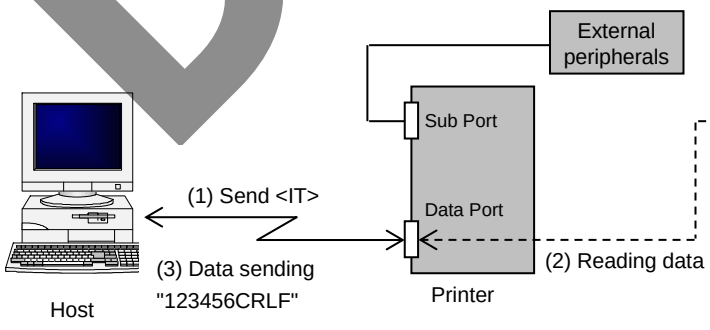
[Coding Example 1] Send data from the host via printer to the external peripheral

<A>
<IT>2,0,6,123456
<Z>



[Coding Example 2] Upload the contents in the internal buffer from the host

<A>
<IB>1
<IT>1,2,6
<Z>



Internal buffer			
No	Item name	Number of digits	Data
01	ITEM CODE	6	123456
02		0	
03		0	
. . .	. . .	. . .	. . .
16		0	

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[Notes]

1. Do not use this command together with print data.
2. Data sending is valid only when bidirectional communication is available.
3. The allocation of the data port and sub port to the interface card 1 or 2 is according to the setting in the interface mode.
4. Make sure to match the digit of sending and sending data. When the digit is not matched, the following data may not be analyzed correctly.
5. Data will not be sent to the external peripherals when the cable of sub port is not connected.
6. There is a similar command called "Receive data acquisition request."
   The printer returns the data received from the status port to the data port by receiving this command.

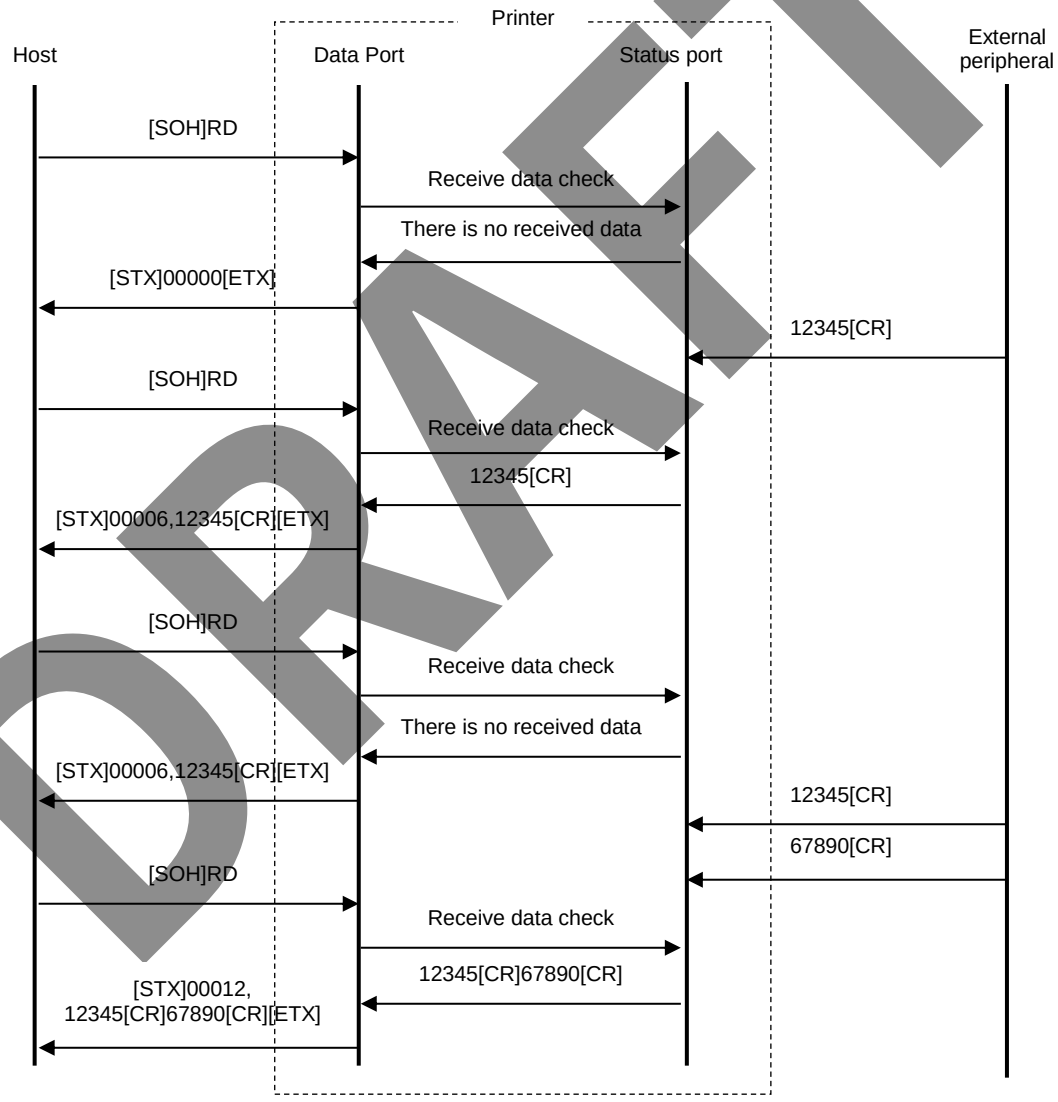
(1) Command
SOH(01H) + RD

(2) Return Status
[STX]+ number of receive bytes + receive data + [ETX]

(3) Return status list

NO.	Item	Description	Number of bytes
1	Number of receive bytes	Number of receive data (0-10240)	5
2	Received Data	Data received from the status port	For number of receive bytes

(4) Acquired sequence



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15.11 Intelligent Command

External Signal Input/Output

ESC+IO

Hexadecimal code	ESC	IO	Parameter
	$<1B>_{16}$	$<49>_{16}<4F>_{16}$	a,b,c[,dddddd]
Initial value	Nil		

Valid range and term of command		
	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify input/output of the designated pin number of the external signal.

[Format]

<IO>a,b,c[,dddddd]

●Parameter

a[Input or output] = 0 : Input
1 : Output

b[Pin number] = Valid range : 1 ～ 25

c[Input/Output level] = 0 : Low
1 : High

d[Timeout for input] = Valid range : 0 ～ 999999(1=5ms) (Omissible)

* When it is [Input], this parameter is the input timeout time.
When this parameter is omitted, the printer does not proceed to the next command analysis until the next input from the designated port.

[Output time] = Valid range : 0 ～ 999999(1=5ms) (Omissible)

* When it is [Output], this parameter is the output time.
The signal level will be returned to the status before this command after the specified time has been passed when this parameter is specified.
The signal will be output continuously at the specified level when this parameter is omitted.

[Coding Example 1] Wait until HIGH level is input from the EXT20 pin (with 5 second timeout)

```
<A>
<IO>0,20,1,1000
<Z>
```

[Coding Example 2] Output LOW level for 5 seconds to the EXT17 pin (before this command the signal is HIGH level)

```
<A>
<IO>1,17,0,1000
<Z>
```

[Notes]

1. Set the external signal output for "DISABLE" in the advanced mode when using this external signal input/output command <IO>.
   When it is set to "ENABLE", the signal changes regardless with this command because the signal is output on the printer.
2. The timing of signal output is not related the print operation of the printer but when this command is processed.
3. Refer to the input or output for the below table.
4. There may be about 5msec margin of error in the specified output time and the actual signal output time.
5. When the output level and the current output level is the same, the output level will not be changed even the specified output time has passed.

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[Input or Output]

Pin number	Input or Output		Pin number	Input or Output		Pin number	Input or Output	
	14 pins	25 pins		14 pins	25 pins		14 pins	25 pins
1	Output	-	11	Input	-	21		Input
2	-	-	12	-	-	22		Input
3	Output	Output	13	-	-	23		Input
4	Output	Output	14	-	-	24		-
5	Input	Output	15		-	25		-
6	Output	Output	16		Output			
7	Input	Input	17		Output			
8	-	Input	18		Output			
9	Input	Input	19		Output			
10	Output	Input	20		Input			

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15.12 Intelligent Command

Print Start Waiting Time

ESC+IW

Hexadecimal code	ESC	IW	Parameter
	$<1B>_{16}$	$<49>_{16}<57>_{16}$	aaaaaa
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Specify the waiting time to the print start.

[Format]

<IW>aaaaaa

●Parameter

a[Print start waiting time] = Valid range : 0 ～ 999999(1 = 5ms)

[Coding Example] Wait until 5 second has been passed

<A>
<IW>1000
Print Data
<Q>1
<Z>

With the above example, the printer waits for 5 seconds after print data edition has been finished, then print the data.

[Notes]

1. When there are multiple item continuously received, the printer starts printing after the time specified by this command has been passed from the previous item print finish.
2. This command is valid only for the first label when multiple print is specified by <Q> command, and it will be printed continuously without waiting time from the second label.
3. This command is invalid when external signal is enabled.
4. Specify this command together with print data. This command is invalid when there are not print data.
5. When there is a printer error or the printer becomes the offline state while waiting for print start, the printer waits again for the specified time when the printing has been resumed.
6. When the printing has been stopped by receiving print stop request command(DLE) while waiting for print start, the waiting for print start is also stopped. When the printing has resumed by receiving print start request command(DC1), the waiting time is resumed at the stopped time.
7. The printer will not wait for print start when reprint by reprint command <C> or function key.

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15.13 Intelligent Command

Internal Buzzer Sound

ESC+IU

Hexadecimal code	ESC	IU	Parameter
	$<1B>_{16}$	$<49>_{16}<55>_{16}$	a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

Beep the buzzer inside the printer.

[Format]

<IU>a

●Parameter

a[Sound pattern] = Valid range : 0 ～ 4

0 : One short beep
1 : One long beep
2 : Two short beep
3 : Two long beeps
4 : Three long beep

[Coding Example] One short beep

<A>
<IU>0
<Z>

[Notes]

1. The beep time for the short beep is 100msec, and 500msec for the long beep.
2. The interval between beeps for the sound pattern 2, 3, and 4 is 5msec or longer.
3. The analysis of received data stops while a buzzer beeping.
4. The timing of buzzer sound may be untimely with the current printing item when multi buffer operation. Acquire the printer status and send this command in order to synchronize with the item print timing.

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15.14 Intelligent Command

Internal Buffer Initialization

ESC+I@

Hexadecimal code	ESC	I@	Parameter
	$<1B>_{16}$	$<49>_{16}<40>_{16}$	(aa)
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]
Initialize the internal buffer.

[Format]
<I@>(aa)

●Parameter
a[Internal buffer number to be initialized] = Valid range : 1 ～ 16(omissible)
All the internal buffer will be initialized when the buffer number is omitted.

[Coding Example 1] Initialize the internal buffer number 6
<A>
<I@>06
<Z>

[Coding Example 2] Initialize all the internal buffer
<A>
<I@>
<Z>

Internal buffer			
No	Item name	Number of digits	Data contents
01	DATA1	2	49
02	DATA2	6	123456
03	DATA3	4	1234
04		0	
05		0	
06	QTY	4	0010
07		0	
08		0	
09		0	
10		0	
11		0	
12		0	
13		0	
14		0	
15		0	
16		0	

[Notes]
1. Do not specify this command in the same item as data receive command <IR> and data send command <IT>.
2. It is not possible to undo the internal buffer data that are initialized.
3. The digit of appropriate buffer number become 0, and item name and the data contents string are deleted after the initialization.

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15.15 Intelligent Command

Exclusive Display Start-End

ESC+IY

Hexadecimal code	ESC	IY	Parameter
	$<1B>_{16}$	$<49>_{16}<59>_{16}$	a
Initial value	Nil		

Valid range and term of command	When the power switch is OFF	The set parameter is not maintained.
	Valid range within item	The parameter preset will be invalid.
	Valid range between item	The parameter preset will be invalid.

[Function]

The message area(upper and lower column) that is specified by display message command <IM> is exclusively used and messages from the printer system will not be displayed temporarily.

[Format]

<IY>a

●Parameter

a[Exclusive display start-end] = 1 : Start exclusive display
0 : End exclusive display

[Coding Example 1] Start exclusive display

<A>
<IY>1
<Z>

[Coding Example 2] End exclusive display

<A>
<IY>0
<Z>

[Notes]

1. Do not specify this command together with other SBPL commands in the same item.
2. Send this command only when the printer is online and operation stop(waiting for receive) status.
3. The data which this command is included are not received while the printer is operating. This is true for both start/end exclusive display. The data will be received when the printer operation stopped.
4. The icon display area is not possible to use exclusively.
5. This command is invalid when the printer is offline or error state.
6. Error messages are not displayed while the display is used exclusively. Confirm with icons only.
7. The display will not be used exclusively when message display is not specified by the <IM> command.

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Part 2 Interface Specification

1 Overview

1.1 Overview

There are built-in interfaces for data communication with the host system, and an interface that connect external interface for communication of the printer and peripherals.

The printer has the following built-in interfaces.

1) RS-232C interface (DP9pin (female terminal))
2) LAN interface (10BASE-T/100BASE-TX auto-detecting, RJ45 connector)
3) USB interface (USB2.0 High speed, type A connector/type B connector)
4) IEEE1284 interface (communication mode: ECP mode/compatible, Amphenol 36 pin)
5) External signal interface (D-SUB25 pin)

The following interfaces are optional.

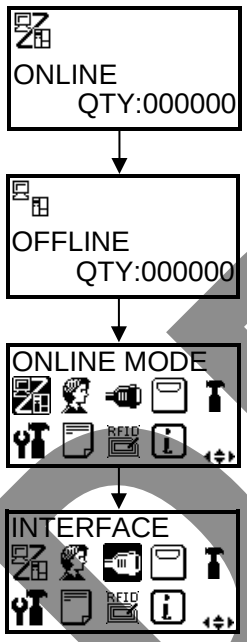
1) Wireless LAN unit (802.11b/g/n)
2) Bluetooth interface (Ver.2.0+EDR Class 2)

1.2 Function setting

You need to configure each interface in the interface mode of the printer before using it.

1)Procedure to go to the interface mode

Here is the procedure to go to the interface mode to configure each interface.



(1) Power on the printer, press the LINE key once while the printer is ONLINE. Printer goes OFFLINE.

(2) Press the ENTER key once. The printer goes to the MODE MENU.

(3) Press the right arrow key twice to move the cursor to .

(4) Press the ENTER key once. The printer goes to the interface mode.

*When you changed the configuration, be sure to turn the printer's power off and turn it on again.

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2) How to configure each interface

You need to configure both "Data Port" and "Sub Port". The following are overview of each ports.

(1) Data Port

This port receives print data from PC. All SBPL commands are available in this port.

<Configurable interfaces for the Data Port>

USB, LAN, IEEE1284, RS-232C, Bluetooth (optional), wireless LAN (optional)

The interface configured as Sub Port cannot be used as the Data Port interface.

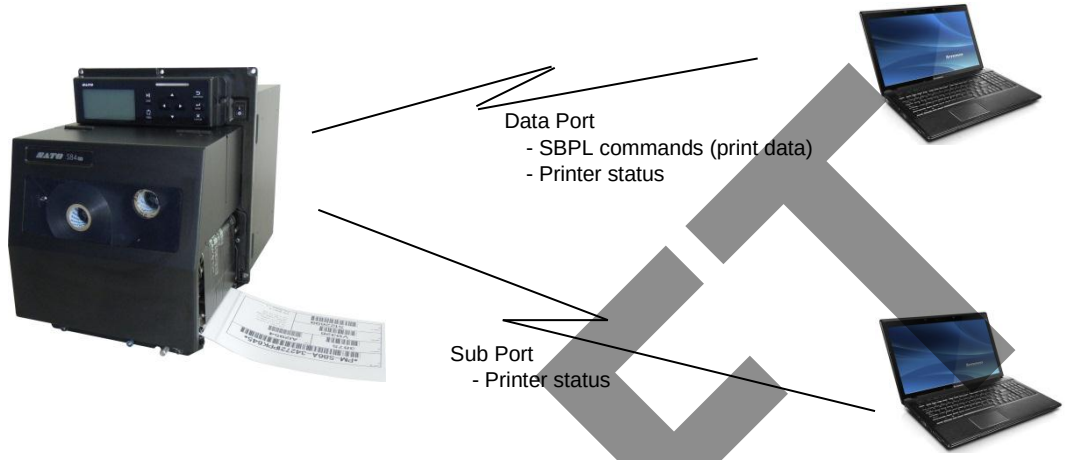
(2) Sub Port

This port monitors the printer status. Please refer to "**2.2Return Status** " for available commands in this port.

<Configurable interfaces for the Sub Port>

USB, LAN, IEEE1284, RS-232C, Bluetooth (optional), wireless LAN (optional)

The interface configured as Data Port cannot be used as the Sub Port interface.



1.3 Combination of interfaces

The following combinations are available for the Data Port and the Sub Port.

		Data Port					
		RS-232C	IEEE1284	USB	LAN	Wireless LAN	Bluetooth
Sub Port	RS-232C		○	○	○	○	○
	IEEE1284	○		○	○	○	○
	USB	○	○		○	×	○
	LAN	○	○	○		○	○
	Wireless LAN	○	○	×	○		○
	Bluetooth	○	○	○	○	○	

[○: configurable, ×: not configurable]

(Notes)

1.It is not possible to select Wireless LAN in the interface mode when a wireless LAN unit is not connected.

2.It is not possible to use wireless LAN and USB at the same time because the wireless LAN unit is connected to the printer through USB.

3.The Sub Port can not be used when Interface Auto Detection is enabled.

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2 Communication Protocol

2.1 Communication protocols and Receive Mode

There are 2 kinds of receive mode; single item and multiple, and the receive mode will be different according to the combination of the interface and the communication protocol.

- Single item receive
  Single item (ESC A - ESC Z) can be received after the previous single item has printed.
- Multiple receive mode
  Enabling receiving data up to near full size during printing.
- Bidirectional communication (Status 2, Status 3, Status 4, Status 5)
  Monitoring printer status and perform data communication.
- Unidirectional communication (READY/BUSY)
  Data communication is controlled by the hardware.
- Refer to each interface section for details of READY/BUSY, XON/XOFF, Status 3, Status 4 and Status 5.

Available communication protocol is as follows.

Interface / Communication Protocol	RS-232C	IEEE1284	USB	LAN	Bluetooth (optional)	Wireless LAN (optional)
Single item receive Unidirectional communication	×	○	×	×	×	×
Multiple receive Unidirectional communication	×	○	×	×	×	×
READY/BUSY Single item receive Unidirectional communication	○	×	×	×	×	×
READY/BUSY Multiple receive Unidirectional communication	○	×	×	×	×	×
XON/XOFF Single item receive Bidirectional communication	○	×	×	×	×	×
XON/XOFF Multiple receive Bidirectional communication	○	×	×	×	×	×
Status 2 Single item receive Bidirectional communication	○	×	×	×	×	×
Status 3 Multiple receive Bidirectional communication	○	×	×	○	○	○
Status 4 Multiple receive Bidirectional communication	○	○	○	○	○	○
Status 5 Multiple receive Bidirectional communication	○	○	○	○	×	○

[○: available, × : not available]

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2.2 Return Status

Purpose of return status is to control the printer status from the host, and the printer returns the status after receiving the status request command.
There are 4 kinds of return status; Status 2, Status 3, Status 4, and Status 5. The return status is as follows.
The printer returns the status after receiving the status request command.

Communication Protocol	Command	Command name	Data Port	Sub Port	Note
READY/BUSY	—	—	○	×*1	
XON/XOFF	—	—	○	×*1	
Status 2	ENQ	Status request command	○	○	Excluding HEX dump mode
	CAN	Cancel request command	○	×	
Status 3	ENQ	Status request command	○	○	Excluding HEX dump mode
	CAN	Cancel request command	○	×	
Status 4	ENQ	Status request command	○	○	Excluding HEX dump mode
	CAN	Cancel request command	○	×	
	DLE	Print pause request command	○	×	Disabled in Bluetooth
	DC1	Print resume request command	○	×	Disabled in Bluetooth
Status 5	SOH + ENQ	Status request command	○	○	Excluding HEX dump mode
	SOH + CAN	Cancel request command	○	×	
	SOH + DLE	Print pause request command	○	×	
	SOH + DC1	Print resume request command	○	×	
Status 3 Status 4 Status 5	SOH + MG	Print configuration request	○	○	
	SOH + SB	System version information request	○	○	
	SOH + EB	Free memory space information request	○	○	
	SOH + FO	Form overlay information request	○	○	
	SOH + CR	Status 5 setting information request	○	×	
	SOH + LW	Status 5 history data information request	○	×	
	SOH + LA	LAN information request	○	×	
	SOH + WZ	Wireless LAN information request	○	×	*2 Closed to the users
	SOH + WI	Wireless LAN field intensity information request	○	○	
	SOH + H5	Wireless LAN interface information request	○	×	
	SOH + wa	Association Threshold information request	○	×	
	SOH + wr	Roaming Threshold information request	○	×	
	SOH + WS	Work shifts information request	○	×	

[○ : supported, × : not supported]

*1 The Sub Port of READY/BUSY and XON/XOFF is configurable, but the commands that can be used for the Sub Port are not supported.
*2 Printer returns the status responding to ESC+ENQ and ESC+CAN after processing the command in Status 2,3 and 4, however doesn't process the command and doesn't return the status for ESC+DLE and ESC+DC1.

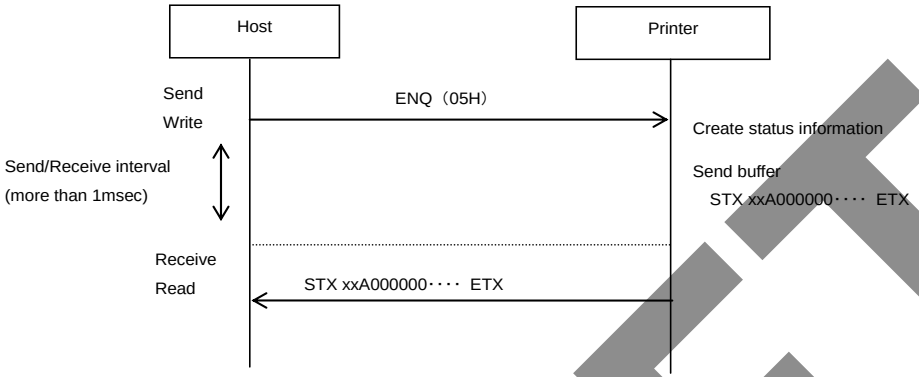
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(Note)

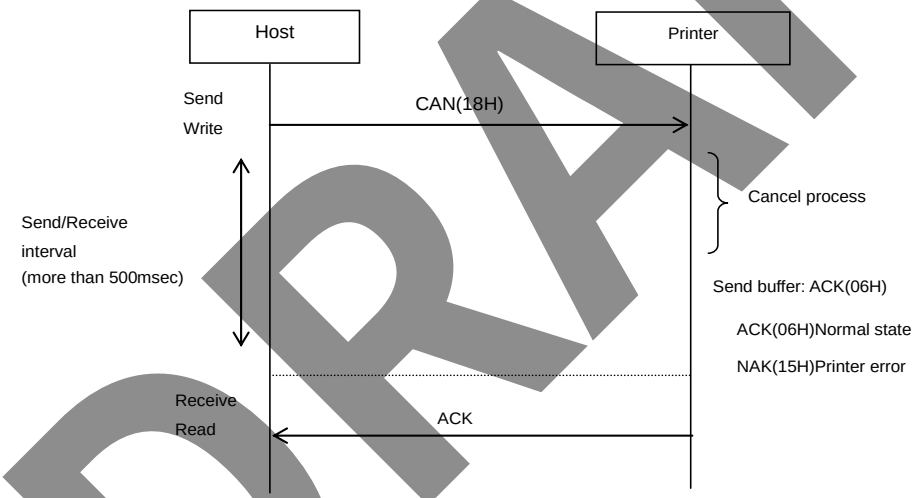
In order to obtain a return status from the printer, insert the time interval of sending and receiving after sending each command to the printer.

Command	Command name	A time interval of sending and receiving (Guideline)
ENQ (05H)	Status request	1 msec or more * In case of wireless LAN, 300 msec or more
CAN (18H)	Cancel request	500 msec or more
DLE (10H)	Print pause request	
DC1 (11H)	Print resume request	

(1) ENQ (Status request)



(2) CAN (Cancel request)



The values stated above are reference of waiting time until the printer confirms the ACK return. Actual value varies depending on the type of interface, settings and the conditions.

Guideline of send and receive time interval of cancel request at buffer near full is more than 900 msec.

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2.2.1 Return status of Status 2

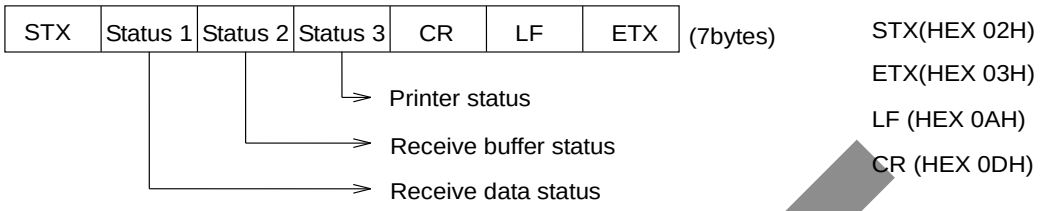
The printer returns the printer status by receiving the status request command sent from the host.
The printer initializes the receive buffer and cancels the print job by receiving the cancel request command.
The details of each request command and return status are as follows.

1) Status request command

The printer returns the state of the receive data, the receive buffer and the printer by receiving this command sent from the host.

(1) Command ENQ (HEX 05H)

(2) Return status/format



(3) Status list

State of receive data

Status return	Description
"0" (HEX 30H)	Indicates the receive text was received normally.
"0" (HEX 31H)	Indicates the receive text was received normally. (Communication error, receive buffer overflow)

State of receive buffer

Status return	Description
"0" (HEX 30H)	Indicates no data exist in the receive buffer.
"9" (HEX 39H)	Indicates data exist in the receive buffer.

Printer status

Status return	Description
"0" (HEX 30H)	Normal (Receivable state)
"0" (HEX 31H)	Offline or print pause
"@" (HEX 40H)	Ribbon end
"A" (HEX 41H)	Paper end
"B" (HEX 41H)	(Unused) Cutter sensor error
"E" (HEX 45H)	Head Open
"G" (HEX 47H)	Head error
"J" (HEX 4AH)	Card error
"k" (HEX 6BH)	Other error

* There is no ribbon end with the direct thermal model.

2) Cancel request command

This command enables to cancel print jobs and to clear the entire contents of the receive buffer.
Note that the printer doesn't return the status with this command. Make sure to send the next data after the elapse of 500 msec as delay time after sending the cancel request.
This command is also effective in offline state and the time of the error.

(1) Command CAN (HEX 18H)

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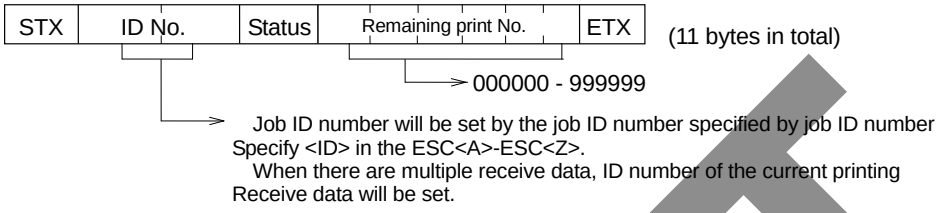
2.2.2 Return status of Status 3

The printer returns the printer's status and reply as the status by receiving 3 types of request commands and print command with this communication protocol.
Details of request commands and return status are described below.

1) Status request command

The printer returns the job ID number of receive data that is currently printing, the printer status and the number of the remaining labels to print to the host by receiving this command. Return all "0" (HEX 30H) as the print quantity after printing is finished or there is no more receive data. If the command Job ID Number <ID> is not specified, the ID number returns space (HEX 20H).
Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX). This may cause return status error or print error.

(1) Command ENQ (HEX 05H)
(2) Return status format



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(3) Status list

Description			ASCII	HEX	
Offline status	No error		0	30	
	Ribbon/Label near end *1		1	31	
	Buffer near full		2	32	
	Ribbon near end *1 & buffer near full		3	33	
	(Unused) Battery near end		5	35	
	(Unused) Battery near end & ribbon/label near end *1		6	36	
	(Unused) Battery near end & buffer near full		7	37	
	(Unused) Battery near end & ribbon/label near end *1 & buffer near full		8	38	
Online status	Reception standby	No error	A	41	
		Ribbon/Label near end *1	B	42	
		Buffer near full	C	43	
		Ribbon near end *1 & buffer near full	D	44	
		(Unused) Battery near end	!	21	
		(Unused) Battery near end & ribbon/label near end *1	"	22	
		(Unused) Battery near end & buffer near full	#	23	
		(Unused) Battery near end & ribbon/label near end *1 & buffer near full	$	24	
	Printing	No error	G	47	
		Ribbon/Label near end *1	H	48	
		Buffer near full	I	49	
		Ribbon/Label near end *1 & buffer near full	J	4A	
		(Unused) Battery near end	%	25	
		(Unused) Battery near end & ribbon/label near end *1	&	26	
		(Unused) Battery near end & buffer near full	‘	27	
		(Unused) Battery near end & ribbon/label near end *1 & buffer near full	(	28	
	Standby (Dispense or cut	No error	M	4D	
		Ribbon/Label near end *1	N	4E	
		Buffer near full	O	4F	
		Ribbon near end *1 & buffer near full	P	50	
		(Unused) Battery near end	)	29	
		(Unused) Battery near end & ribbon/label near end *1	*	2A	
		(Unused) Battery near end & buffer near full	+	2B	
		(Unused) Battery near end & ribbon/label near end *1 & buffer near full	,	2C	
	Analysis/editing	No error	S	53	Print quantity may not be set up properly depending on the timing of analysis/editing.
		Ribbon/Label near end *1	T	54	
		Buffer near full	U	55	
		Ribbon near end *1 & buffer near full	V	56	
		(Unused) Battery near end	-	2D	
		(Unused) Battery near end & ribbon/label near end *1	.	2E	
		(Unused) Battery near end & buffer near full	/	2F	
		(Unused) Battery near end & ribbon/label near end *1 & buffer near full	@	40	
Error detection	Buffer over *2		a	61	
	Head Open		b	62	
	Paper end		c	63	
	Ribbon end *1		d	64	
	Media error (print skip error)		E	65	
	Sensor error		f	66	
	(Unused) Barcode read/verification error		f	66	
	(Unused) Barcode reader connection error		f	66	
	Head error		g	67	
	(Unused) Cover open		h	68	
	(Unused) Cutter open error		h	68	
	(Unused) Ribbon core non-lock error *1		h	68	
	Card error		i	69	
	(Unused) Cutter error		j	6A	
	Other error		k	6B	
	(Unused) Cutter sensor error		l	2C	
	(Unused) Stacker or rewinder full Rewind full		m	2D	
	RFID Tag error		o	6F	
	RFID protect error		p	70	
	(Unused) Battery error		q	71	

Print quantity may not be set up properly depending on the timing of analysis/editing.

*1 There is no ribbon end with the direct thermal model.

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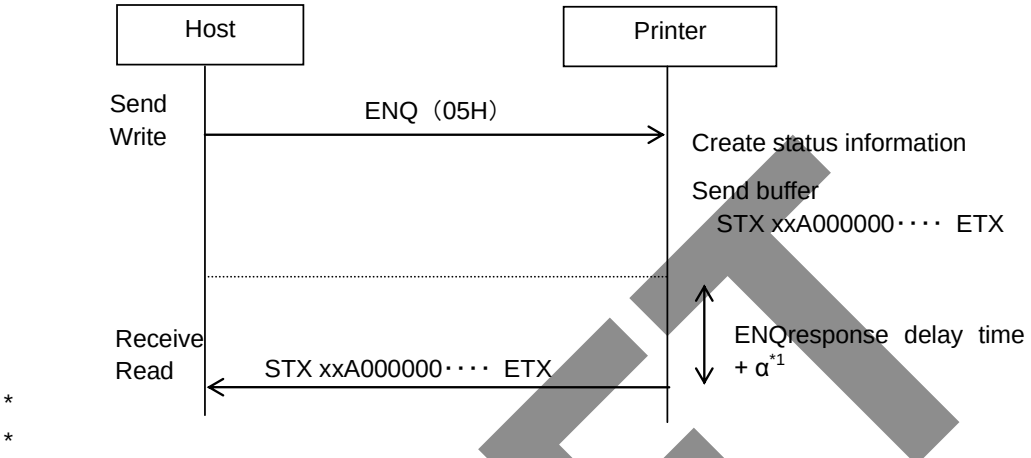
*2 Occurrence of buffer-over depends on the interface.

RS-232C	USB	LAN	Wireless LAN	Bluetooth	IEEE1284
○	×	×	×	×	×

[o: Interface that buffer-over occurs, x: Interface that buffer-over doesn't occur]

(4) ENQ respond delay time setting

You can use delay timer function to delay returning the printer status to the host by setting [ENQ respond delay time] in the service mode. Refer to the “Operetor Manual” for more setting details.



*1 Time period of "+α" varies according to the interface or the behavior of the application in the host.

2) Cancel request command

This command enables to cancel print jobs and to clear the entire contents of the receive buffer.

The printer returns the printer status of after completion of the current process.

*When the cancel request command has sent, wait more than 500 msec before sending the next data.

*This command shall not be used during sending printer data and other data.

(1) Command CAN (HEX 18H)

(2) Return status list

Status return	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error at the printer

3) Print Command

The printer starts printing by receiving the print command (STX <A> ~<Z> ETX).

The printer returns the printer status after receiving process is completed.

(1) Return status list (Printer status)

Status return	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error at the printer

An example of the job ID number command <ID>

```
<A>
<ID>01
<V>100<H>100<P>2<L>0202<XM>ABC
<Q>1
<Z>
```

Refer to the Job ID number command <ID>.

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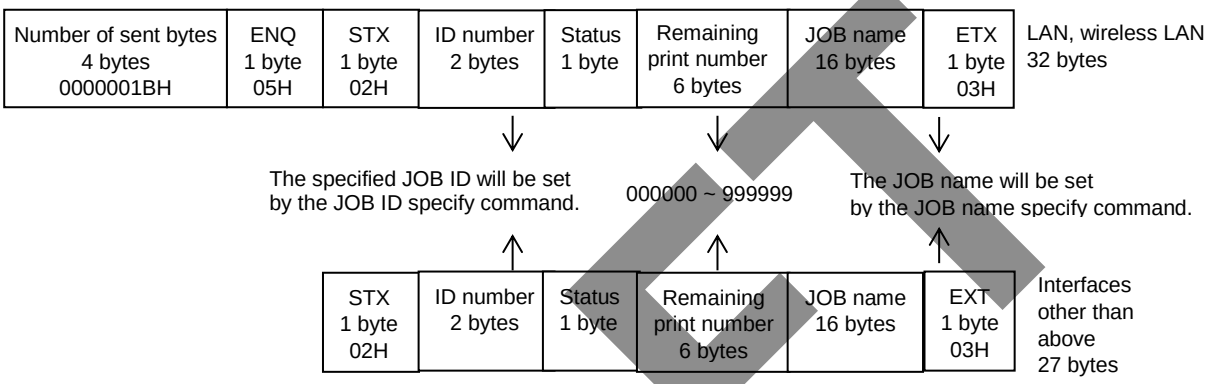
2.2.3 Return status of Status 4

The printer returns the printer's status and reply as the status by receiving 5 types of request commands and print command with this communication protocol.
Details of request commands and return status are described below.

1) Status request command

The printer returns the job ID number of receive data that is currently printing, the printer status and the number of the remaining labels to print to the host by receiving this command. Return all "0" (HEX 30H) as the print quantity after printing is finished or there is no more receive data. If the job ID command is not specified, space (HEX 20H) is returned as the job ID.
Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX). This may cause return status error or print error.

(1) Command ENQ (HEX 05H)
(2) Return status format



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(3) Return status list

Description			ASCII	HEX	
Offline status	No error		0	30	
	Ribbon/Label near end *		1	31	
	Buffer near full		2	32	
	Ribbon/label near end * & buffer near full		3	33	
	Print pause (No error)		4	34	
	(Unused) Battery near end		5	35	
	(Unused) Battery near end & ribbon/label near end *		6	36	
	(Unused) Battery near end & buffer near full		7	37	
	(Unused) Battery near end & ribbon/label near end * & buffer near full		8	38	
Offline status	Reception standby	No error	A	41	
		Ribbon/Label near end *	B	42	
		Buffer near full	C	43	
		Ribbon/label near end * & buffer near full	D	44	
		Print pause (No error)	E	45	
		(Unused) Battery near end	!	21	
		(Unused) Battery near end & ribbon/label near end *	"	22	
		(Unused) Battery near end & buffer near full	#	23	
		(Unused) Battery near end & ribbon/label near end * & buffer near full	$	24	
	Printing	No error	G	47	
		Ribbon/Label near end *	H	48	
		Buffer near full	I	49	
		Ribbon/label near end * & buffer near full	J	4A	
		Print pause (No error)	K	4B	
		(Unused) Battery near end	%	25	
		(Unused) Battery near end & ribbon/label near end *	&	26	
		(Unused) Battery near end & buffer near full	‘	27	
		(Unused) Battery near end & ribbon/label near end * & buffer near full	(	28	
	Standby (Dispense or cut)	No error	M	4D	
		Ribbon/Label near end	N	4E	
		Buffer near full	O	4F	
		Ribbon/label near end * & buffer near full	P	50	
		Print pause (No error)	Q	51	
		(Unused) Battery near end	)	29	
		(Unused) Battery near end & ribbon/label near end *	*	2A	
		(Unused) Battery near end & buffer near full	+	2B	
		(Unused) Battery near end & ribbon/label near end * & buffer near full	,	2C	
	Analysis/editing	No error	S	53	Print quantity may not be set up properly depending on the timing of analysis/editing. .
		Ribbon/Label near end *	T	54	
		Buffer near full	U	55	
		Ribbon/label near end * & buffer near full	V	56	
		Print pause (No error)	W	57	
		(Unused) Battery near end	-	2D	
		(Unused) Battery near end & ribbon/label near end *	.	2E	
		(Unused) Battery near end & buffer near full	/	2F	
		(Unused) Battery near end & ribbon/label near end * & buffer near full	@	40	
Error detection	Head open		b	62	
	Paper end		c	63	
	Ribbon end *		d	64	
	Media error (print skip error)		E	65	
	Sensor error		f	66	
	(Unused) Barcode read/verification error		f	66	
	(Unused) Barcode reader connection error		f	66	
	Head error		g	67	
	(Unused) Cover open		h	68	
	(Unused) Cutter open error		h	68	
	(Unused) Ribbon core non-lock error		h	68	
	Card error		i	69	
	(Unused) Cutter error		j	6A	
	Other error		k	6B	
	(Unused) Cutter sensor error		l	2C	
	(Unused) Stacker or rewinder full Rewind full		m	2D	
	RFID Tag error		o	6F	
	RFID protect error		p	70	
	(Unused) Battery error		q	71	

* There is no ribbon end or ribbon near end with the direct thermal model.

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· **Cause of receive buffer near full**
Buffer near-full occurs when the remaining capacity of receive buffer (2.95MB) becomes 0.95 MB.

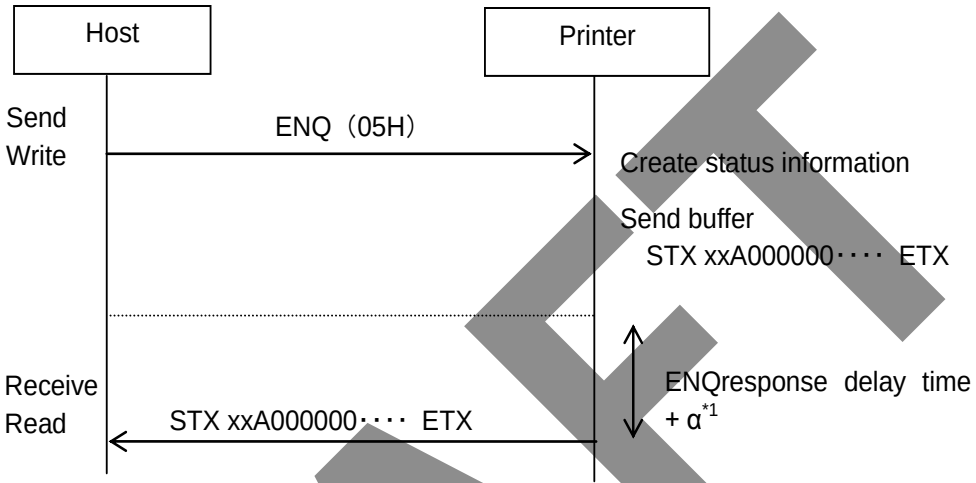
· **Factors to release receive buffer near full**
Receive buffer near full is released when the remaining capacity of the receive buffer becomes 1.95 MB or more.

*Occurrence of buffer-over depends on the interface.

RS-232C	USB	LAN	Wireless LAN	Bluetooth	IEEE1284
○	×	×	×	×	×

[o: Interface that buffer-over occurs, x: Interface that buffer-over doesn't occur]

(4) ENQ respond delay time setting
You can use the delay timer function to delay returning the printer status to the host by setting [ENQ respond delay time] in the service mode. Refer to the “Operator Manual” for more setting details.



*1 Time period of "+α" varies according to the interface or the behavior of the application in the host.
*This function is invalid in the cyclic response mode when using LAN interface.

2) Cancel request command
This command enables to cancel print jobs and to clear the entire contents of receive buffer.
The printer returns the printer status of after completion of the current process.
*When the cancel request command has sent, wait more than 500 ms before sending the next data.
Do not send cancel request command within STX <A>~<Z> ETX. CAN (cancel request) may not be sent.

(1) Command CAN (HEX 18H)
(2) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error at the printer

3) Print Command
Print command (<A>～<Z>) starts the printing process.
The printer returns the printer status after receiving process is completed.
(3) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error at the printer

4) Print Pause Request Command
This command stops the printing process.
The printer returns the printer status after receiving process is completed.
(1) Command DLE (HEX 10H)
(2) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error at the printer

Do not send print pause request command within STX <A>~<Z> ETX. DLE (print pause request) may not be send correctly. DLE (print pause request) in font data, graphics data and barcode data is not processed.

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5) Print resume request command

This command enables to release the print pause and resume printing.
The printer returns the printer status after receiving process is completed.
(1) Command DC1 (HEX 11H)
(2) Return status list

Return Status	Description
ACK (HEX 06H)	No error in the printer
NAK (HEX 15H)	Error at the printer

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2.2.4 Return status of Status 5

The functions in this communication protocol are as follows.

1) Data sending form

(1) Control commands such as print data, status requests, cancel request and so on need to be within STX (HEX 02H) and ETX (HEX 03H). * No need to put STX (HEX 02H) and ETX (HEX 03H) for setting data.
(2) Item No. should be added to the print data. If there is no item No., or specifying illegal item No. will cause item No. error.
(3) When the BCC check function is enabled, it is necessary to put BCC at the end of item (<Z>). However, there is no need for putting BCC at the end of information acquiring command such as status request.

Examples)
Print Data

STX	<A>	<ID>00000	Print Data	<Z>	BCC	ETX

Status request

STX	SOH	ENQ	00000	ETX

2) Item No. command

The objective of this command is to distinguish items by item No. that are put into every item. This command is needed to be included in the print data (<A>~<Z>) when using status 5 reply protocol because high reliability functions provided by the status 5 reply status identify items by the item No.

[Command]
ESC (HEX 1BH) + ID

[Format]
(1) In case of 5 digits
<ID>aaaaa

●Parameter
a "Item No." Valid range : 00000 - 99999 (necessary to put all 5 digits)

(2) In case of 2 digits
<ID>aa

●Parameter
a "Item No." Valid range : In case of 2 digits, remaining 3 digits will be filled with 0.

[Examples]
(1) In case of 5 digits
<A>
<ID>00001
・
・
<Z>

(2) In case of 2 digits
<A>
<ID>01
・
・
<Z>

* There will be a command error when other than 5 digits or 2 digits are entered.

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3) History function

The process status of the received print data (item) will be saved in the history buffer, and the process status can be acquired by item status request command.

[Memory configuration]

Use	Type	Size	Note
Receive buffer History buffer	RAM SFROM	2.95 (MB) 4 (KB)	 The maximum register items: 500 items (ring buffer) The history data will be maintained even the printer power is off.

[History data configuration]

No.	Description	Number of bytes (Total: 8 bytes)
1	Control flag	1
2	Item No.	5
3	Status 00: Received 01: Printed 02: Cancellation 03: Item No. error 04: BCC error 05: Print after error 06: Cancel after error 07: Analyzed item with no print 08: Unprocessed error (items that are not processed before printer power off)	2

[Supplemental explanation]

1. The item No. will be "*****", the status will be "3" when there is no item No. command in the received data or the item No. command is illegal.There will be item No. error and the printing will be stopped at the start of this item print.
2. The history data will be saved in the internal memory, and the status will be maintained after printer off to on. However, when item status before the power off is 00: received, 03: item No. error, 04: BCC error, or 05: print after an error, the receive data will not be saved and these will be 08: unprocessed error.

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4) Item status request command

Upon receive of this command, the printer will search the specified item No. from the end of the history buffer, and return the status of appropriate item.

[Command]

SOH (HEX 01H) + ENQ (HEX 05H)

[Format]

STX + SOH + ENQ + aaaaa + ETX

●Parameter

a "Item No." Valid range : 00000 - 99999
*****

1. The parameter should be always 5 digits.
2. The parameter "*" is "HEX 2AH".
3. When "*****" is specified as the parameter, the status of the last item in the history buffer will be returned to the host...

[Return status format]

[1] STX	[5] Specified Item No.	[2] Specified item Status *1	[5] Currently processed Item No.	[2] Currently processed item Status *2	[6] Currently processed item Number of prints	[1] ETX

STX (HEX 02H) ETX (HEX 03H)

The numbers in the [ ] are the used bytes, and the return status format will be 22 bytes (fixed).
The item No. will be filled with 0.
The currently processed item No. will be space (20h) after print completion.

*1 The below is the specified item status list

Description	ASCII	HEX
Received	00	3030
Printed	01	3031
Cancellation	02	3032
Item No. error	03	3033
BCC error	04	3034
Print after error (this is a temporary error and this will be "Printed" after printing)	05	3035
Cancel after error	06	3036
Analyzed item with no print	07	3037
Unprocessed error (printer power has been off before processing the item)	08	3038
Others	**	2A2A

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*2 The first digit is the status and the second digit is the error in the currently processed item status.
The below is the currently processed item status list.

Digit position	Description	ASCII	HEX
1	Offline	0	30
	Online, waiting for receive	1	31
	Online, printing	2	32
	Online, standby (waiting for dispensing)	3	33
	Online, analyzing/editing * The "number of currently processed item" may not be set due to the timing.	4	34
	Error	5	35
	Print pause (when received DLE command)	6	36

Digit position	Description	ASCII	HEX
2	No error	0	30
	Ribbon near end *	1	31
	Buffer near full	2	32
	Ribbon near end * & buffer near full	3	33
	Label near end	4	34
	Battery near end & ribbon near end*	5	35
	Ribbon near end & buffer near full	6	36
	Battery near end & ribbon near end* & buffer near full	7	37
	Machine error	A	41
	Flash ROM error	B	42
	Head Open	C	43
	Paper end	D	44
	Ribbon end *	E	45
	Sensor error	F	46
	Head error	G	47
	Memory read/write error (Cartridge read/write error)	H	48
	Memory full (Cartridge full)	I	49
	(Unused) Cutter error	J	4A
	Calendar error	K	4B
	Kanji data error (Kanji ROM error)	L	4C
	(Unused) Internal rewind full	M	4D
	(Unused) Cutter bracket open error	N	4E
	RFID Tag error	O	4F
	RFID protect error	P	50
	BCC error	Q	51
	Item No. error	R	52
	Media error (print skip error)	S	53
	(Unused) Ribbon core non-lock error	T	54
	Other errors	U	55
	Cover open	V	56
	(Unused) Barcode read/verification error	V	56
	(Unused) Barcode reader connection error	W	57

* There is no ribbon end or ribbon near end with the direct thermal model.

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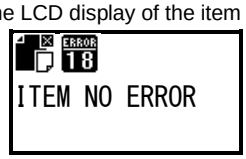
[Examples]
(1) STX SOH ENQ 00001 ETX
(2) STX SOH ENQ ***** ETX

[Supplemental explanation]
1. This command shall not be used during sending other data such as print data. The status may not be returned or print may not be finished correctly when sending this command during print data sending.
2. Upon reception of this command, the printer will search the specified item from the history buffer, and it may take some time to return the status to the host.
3. Item No. that is not sent as the print data shall not be specified as the parameter of this command. The status will not be returned. The status will not be returned when the specifying an illegal item No. The control of item No. shall be done at the host.
4. The latest item status will be returned when there are multiple same item No. in the history buffer.

5) Item No. check function

The printer will check the item No. in the print data if it is incremented one by one with every item. If it is not, the printer will arise "item No. error" at the print start of the item and stop the printing.

The LCD display of the item No. error



*The item No. error will be detected only when the item No. check is enabled.

There are 4 ways to release the item No. error.

(1) Press the LINE key	The printer will resume the printing from the print data with the item No. error.
(2) Send SUB command	The printer will resume the printing after releasing the error. Upon reception of this command, it is possible to select if you want to print or cancel the data with the error.
(3) Send CAN command	The printer will cancel the print data with the error and resume the printing from the next print data.
(4) Press the CANCEL key	The printer will cancel the print data with the error and resume the printing from the next print data.

The history data with the item No. error will be processed as follows according to the error cause.

(1) When the item No. is not specified or the digit is not correct	The item No. will be "*****" and status No. 03 "item No. error" will be recorded.
(2) When the item No. is not incremented by 1	The specified item No. and status No. 03 "item No. error" will be recorded.

[Supplemental explanation]

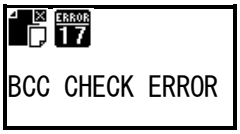
1. The item No. check is targeted only for the print data. Data without printing such as registration data or printer setting commands are not targeted. With those data, please specify "*****" as the item No.
2. When the item No. is specified by the starting item No. specifying command <IQ>, the starting item No. of the next data will be the item No. specified by <IQ> + 1.

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6) BCC check function

BCC (Block Check Code) is 1 byte data that is a result of calculation of XOR for one item of send data (<A>~<Z>).
When sending a data to the printer from the host, you need to put BCC at the end of data (following to <Z>) of every items.
The printer calculates the BCC of every items of received data and checks the validity of the received data by comparing it with the BCC in the received data. When the calculated BCC is not the same as the BCC in the received data, the printer judges the data is incorrect, arises BCC error and stops printing.

The LCD display of BCC error



*The BCC error will be detected only when the BCC check is enabled.

There are 4 ways to release the BCC error.

(1) Press the LINE key	The printer will resume the printing from the print data with the BCC error.
(2) Send SUB command	The printer will resume the printing after releasing the error. Upon reception of this command, it is possible to select if you want to print or cancel the data with the error.
(3) Send CAN command	The printer will cancel the print data with the error and resume the printing from the next print data.
(4) Press the CANCEL key	The printer will cancel the print data with the error and resume the printing from the next print data.

Calculation range of BCC

Print Data

STX	<A>	<ID>00001	Print Data	<Z>	BCC	ETX
	Calculation range of BCC					

[Supplemental explanation]

1. The BCC check is targeted only for the print data. Data without printing such as registration data or printer setting commands are not targeted.
2. The data within <A>~<Z> is the calculation range of the BCC.
3. BCC will be calculated by using the exclusive OR of the data in the calculation range.

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7) Cancel request command

Upon receive of this command, the printer will search the specified item No. from the end of the history buffer, and cancel the appropriate item. However, when the status of the specified item is "Printed", this command is disabled.

[Command]
SOH (HEX 01H) + CAN (HEX 18H)

[Format]
STX + SOH + CAN + aaaaa + ETX

●Parameter

a	"Item No."	Valid range	00000 - 99999
			*****

1. The parameter should be always 5 digits.
2. The parameter "*" is "HEX 2AH".
3. When "*****" is specified as the parameter, all the data that status are "Printed" in the history buffer will be canceled.

[Examples]
(1) STX SOH CAN 00001 ETX
(2) STX SOH CAN ***** ETX

[Supplemental explanation]
1. This command shall not be used during sending other data such as print data.
2. Upon reception of this command, the printer will search the specified item from the history buffer, and it may take some time to cancel.
3. Item No. that is not sent as the print data shall not be specified as the parameter of this command. The printer is not being able to cancel the item. The printer is not being able to cancel the item when specifying an illegal item No. The control of item No. shall be done at the host.
4. There is no returned data to the command.
   To check the result of the command, you need to send item status request command (SOH + ENQ).
5. This command becomes invalid when the appropriate item No. is under printing at the reception of this command.

8) Print pause request command

This command stops the printing process.

[Command]
SOH (HEX 01H) + DLE (HEX 10H)

[Format]
SOH + DLE

[Examples]
SOH DLE

[Supplemental explanation]
1. This command shall not be used during sending other data such as print data.
2. There is no returned data to the command.
   To check the result of the command, you need to send item status request command (SOH + ENQ).

9) Print resume request command

Upon receive of this command, the printer release the print pause status specified by the print pause request command (SOH + DLE) and resume printing process.

[Command]
SOH (HEX 01H) + DC1 (HEX 11H)

[Format]
STX + SOH + DC1 + ETX

[Examples]
STX SOH DC1 ETX

[Supplemental explanation]
1. This command shall not be used during sending other data such as print data.
2. There is no returned data to the command. To check the result of the command, you need to send item status request command (SOH + ENQ).

DRAFT

10) Error release request commands in Status 5

Upon receive of this command, the printer releases the item No. error or BCC error, and resume printing from the item with the error.

[Command]

SOH (HEX 01H) + SUB (HEX 1AH)

[Format]

STX + SOH + SUB + a + ETX

a "Release" 0: cancel the data with error
1: print the data with error

[Examples]

STX SOH SUB 0 ETX

[Supplemental explanation]

1. This command shall not be included in the print data (<A>~<Z>).
2. There is no returned data to the command. To check the result of the command, you need to send item status request command (SOH + ENQ).

11) Starting item No. specifying command

This is a command to notify the item No. of the first print data to be sent to the printer. The printer regards the value of the item No. specified by this command + 1 as the item No. of print data sent afterwards.

[Command]

<IQ>

[Format]

<IQ> aaaaa

●Parameter

a "Item No." Valid range : 00000 - 99999 (necessary to put all 5 digits)

[Example 1]

<A>
<ID> *****
<IQ> 00000
<Z>

<A>
<ID> 00001
.
.
<Z>

[Example 2]

<A>
<ID> *****
<IQ> 99999
<Z>

<A>
<ID> 00000
.
.
<Z>

[Supplemental explanation]

1. This command shall not be included in the print data (<A>~<Z>).
2. When "99999" is specified with this command, the next item No. will be "00000".

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12) The protocol switch command in Status 5

This command switched the communication protocol.

[Command]

ESC (HEX 1BH) + PL

[Format]

<PL>a

●Parameter

a	"switches protocol"	0 : READY/BUSY
		1 : XON/XOFF
		2 : Printer Status 2 Return
		3 : Printer Status 3 Return
		4 : Printer Status 4 Return
		5 : Printer Status 5 Return

[Examples]

<A>
<ID> *****
<PL> 5
<Z>

[Supplemental explanation]

1. This command (<A>~<Z>) should be separated from the print data (<A>~<Z>).
2. This setting is maintained after printer power off.
3. This will become invalid when specifying protocols not supported in the used interfaces.
4. When the protocol is changed, the printer needs to be rebooted. Without rebooting, data communication may be incorrect.

13) Check command in status 5

This is a command to set the check function of BCC and item No. in the status 5 return.

[Command]

ESC (HEX 1BH) + CR

[Format]

<CR>a,b

●Parameter

a	"BCC check"	0 : Disabled BCC check (default)
		1 : Enabled BCC check
b	"Item No check"	0 : Disabled item No. check (default)
		1 : Enabled item No. check

[Examples]

<A>
<ID> *****
<CR> 1, 1
<Z>

[Supplemental explanation]

1. This command shall not be included in the print data (<A>~<Z>).

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14) History data request command

Upon receive of this command, the printer will send 500 history data to the host.

[Command]

SOH (HEX 01H) + LW

[Format]

STX + SOH + LW + ETX

[Examples]

STX SOH LW ETX

[Format of returned history data]

[1] STX	[5] Item No.	[2] Status	[2] CR LF	. . . . .	[5] Item No.	[2] Status	[1] ETX

STX (HEX 02H)

CR (HEX 0DH)
LF (HEX 0AH)

ETX (HEX 03H)

Numbers in the [ ] are used bytes.
Item No. will be filled with "0".
The history data will be separated by CRLF at every item, and there are a total of 500 items.
Please refer to the "History data configuration in 3) History function".

[Supplemental explanation]

1. This command shall not be included in the print data (<A>~<Z>).
2. Do not send any data to the printer while the printer is sending history data to the host.

DRAFT

2.2.5 Other return status (Common to Status 3, Status 4, and Status 5)

1) Print configuration request

The printer returns the printer configuration to the host by receiving this command.

(1) Command SOH (01H) + MG

(2) Return status list

<table>
<tr><th>No.</th><th>Item</th><th>Description</th><th>Number of bytes</th></tr>
<tr><td>1</td><td>Print method</td><td>00H : Thermal transfer
01H : Direct thermal
* Only direct thermal is available in the direct thermal model.</td><td>1</td></tr>
<tr><td>2</td><td>Print resolution</td><td>00H : 8 dots/mm
01H : 12 dots/mm
02H : 24 dots/mm

<table><tr><td>Model</td><td>Range</td></tr><tr><td>S84-ex</td><td>00H、01H、02H</td></tr><tr><td>S86-ex</td><td>00H、01H</td></tr></table></td><td>1</td></tr>
<tr><td>3</td><td>Print speed</td><td>00H : 2 (inches/sec) 50 (mm/sec)
02H : 3 (inches/sec) 75 (mm/sec)
04H : 4 (inches/sec) 100 (mm/sec)
06H : 5 (inches/sec) 125 (mm/sec)
08H : 6 (inches/sec) 150 (mm/sec)
0AH : 7 (inches/sec) 175 (mm/sec)
0CH : 8 (inches/sec) 200 (mm/sec)
0EH : 9 (inches/sec) 225 (mm/sec)
10H :10 (inches/sec) 250 (mm/sec)
12H :11 (inches/sec) 275 (mm/sec)
14H :12 (inches/sec) 325 (mm/sec)
16H :13 (inches/sec) 350 (mm/sec)
18H :14 (inches/sec) 375 (mm/sec)
1AH :15 (inches/sec) 400 (mm/sec)
1CH :16 (inches/sec) 425 (mm/sec)

[S84-ex]<table><tr><td>Head density</td><td>Range (inches/sec)</td></tr><tr><td>8dots/mm (203 dpi)</td><td>4 - 16</td></tr><tr><td>12dots/mm (305 dpi)</td><td>4 - 14</td></tr><tr><td>24dots/mm (609 dpi)</td><td>2 - 6</td></tr></table>[S86-ex]<table><tr><td>Head density</td><td>Range (inches/sec)</td></tr><tr><td>8dots/mm (203 dpi)</td><td>4 - 14</td></tr><tr><td>12dots/mm (305 dpi)</td><td>4 - 12</td></tr></table></td><td>1</td></tr>
<tr><td>4</td><td>Print mode</td><td>00H : Continuous
03H : Dispense
04H : Linerless</td><td>1</td></tr>
<tr><td>5</td><td>Not used</td><td>00H : Fixed</td><td>1</td></tr>
<tr><td>6</td><td>Dispensing motion</td><td>00H : After printing [Motion 1 (Stop position: Head)]
01H : Before printing [Motion 2 (Stop position: Dispense)]
02H : No backfeed</td><td>1</td></tr>
<tr><td>7</td><td>Not used</td><td>00H fixed</td><td>1</td></tr>
<tr><td>8</td><td>Print darkness</td><td>Darkness range A (41H) : A

Darkness level 01H : Darkness 1
02H : Darkness 2
03H : Darkness 3
04H : Darkness 4
05H : Darkness 5
06H : Darkness 6
07H : Darkness 7
08H : Darkness 8
09H : Darkness 9
0AH : Darkness 10</td><td>2</td></tr>
</table>

DRAFT

Return status list (continued from previous page)

<table>
<tr><th>No.</th><th>Item</th><th>Description</th><th>Number of bytes</th></tr>
<tr><td>9</td><td>Sensor type</td><td>00H : I-Mark sensor
01H : Gap sensor
02H : Ignore sensor</td><td>1</td></tr>
<tr><td>10</td><td>Zero slash</td><td>00H : DISABLE
01H : ENABLE</td><td>1</td></tr>
<tr><td>11</td><td>Character code</td><td>02H : UTF-16
03H : UTF-8</td><td>1</td></tr>
<tr><td>12</td><td>Not used</td><td>00H : fixed</td><td>1</td></tr>
<tr><td>13</td><td>Initial feed</td><td>00H : DISABLE
01H : ENABLE</td><td>1</td></tr>
<tr><td>14</td><td>Proportional Pitch</td><td>00H : DISABLE (Default)
01H : ENABLE</td><td>1</td></tr>
<tr><td>15</td><td>Label height</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm (203 dpi)</td><td>0001H - 4E20H</td><td>1 - 20000 dots</td></tr>
<tr><td>12dots/mm (305 dpi)</td><td>0001H - 4650H</td><td>1 - 18000 dots</td></tr>
<tr><td>24dots/mm (609 dpi)</td><td>0001H - 2580H</td><td>1 - 9600 dots</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm (203 dpi)</td><td>0001H - 2708H</td><td>1 - 9992 dots</td></tr>
<tr><td>12dots/mm (305 dpi)</td><td>0001H - 3A8CH</td><td>1 - 14988dots</td></tr>
</table></td><td>2</td></tr>
<tr><td>16</td><td>Label width</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm (203 dpi)</td><td>0001H - 340H</td><td>1 - 832 dots</td></tr>
<tr><td>12dots/mm (305 dpi)</td><td>0001H - 4E0H</td><td>1 - 1248 dots</td></tr>
<tr><td>24dots/mm (609 dpi)</td><td>0001H - 9C0H</td><td>1 - 2496 dots</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm (203 dpi)</td><td>0001H – 53CH</td><td>1 - 1340 dots</td></tr>
<tr><td>12dots/mm (305 dpi)</td><td>0001H – 7DAH</td><td>1 - 2010 dots</td></tr>
</table></td><td>2</td></tr>
<tr><td>17</td><td>Offset of vertical reference point (dot)</td><td>[00H – 270FH] (0 ~ 9999)
[FFFFH – D8F1H] (-1 ~ -9999)</td><td>2</td></tr>
<tr><td>18</td><td>Offset of horizontal reference point (dot)</td><td>[S84-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm (203 dpi)</td><td>0001H – 0340H
FFFFH– FCC0H</td><td>1 – 832 dots
-1 – -832 dots</td></tr>
<tr><td>12dots/mm (305 dpi)</td><td>0001H – 04E0H
FFFFH – FB20H</td><td>1 – 1248 dots
-1 – -1248 dots</td></tr>
<tr><td>24dots/mm (609 dpi)</td><td>0001H – 09C0H
FFFFH – F640H</td><td>1 – 2496 dots
-1 – -2496 dots</td></tr>
</table>
[S86-ex]
<table>
<tr><th>Head density</th><th>Range (HEX)</th><th>Range (DEC)</th></tr>
<tr><td>8dots/mm (203 dpi)</td><td>0001H – 053CH
FFFFH – FAC4H</td><td>1 – 1340 dots
-1 – -1340 dots</td></tr>
<tr><td>12dots/mm (305 dpi)</td><td>0001H – 07DAH
FFFFH – F826H</td><td>1 – -2010 dots
-1 – -2010 dots</td></tr>
</table></td><td>2</td></tr>
<tr><td>19</td><td>Not used</td><td>00H Fixed</td><td>1</td></tr>
<tr><td>20</td><td>Time to LCD power saving (in minute)</td><td>[00H - 0FH] (0 - 15) default : AH (00)</td><td>1</td></tr>
<tr><td>21</td><td>Not used</td><td>00H Fixed</td><td>1</td></tr>
<tr><td>22</td><td>Not used</td><td>00H Fixed</td><td>1</td></tr>
<tr><td>23</td><td>Not used</td><td>00H Fixed</td><td>1</td></tr>
<tr><td>24</td><td>Not used</td><td>00H Fixed</td><td>1</td></tr>
<tr><td>25</td><td>Buzzer setting</td><td>00H : None
01H : Small
02H : Medium
03H : Large</td><td>1</td></tr>
</table>

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2) System version information request

This command returns the system version information of the printer.

(1) Command SOH (01H) + SB

(2) Return status format

STX (HEX 02H)
ETX (HEX 03H)

[STX] + Printer system version +[ETX]

STX	Printer firmware	Font	Reserved	ETX

(Total: 52 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Printer firmware version	ASCII Code	16
2	Font version	ASCII Code	8
3	Reserved (HEX 20H fixed)	ASCII Code	26

3) Free memory space information request

This command returns the information of free memory space (FLASH MEMORY) of the printer.

(1) Command SOH (01H) + EB

(2) Return status format

STX (HEX 02H)
ETX (HEX 03H)

[STX] + free memory space + [ETX]

STX	Font free space	Font total space	Foam overlay free space	Foam overlay total space	Graphics free space	Graphics total space	ETX

(Total: 26 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Font free space	Binary data	4
2	Font total space	Binary data	4
3	Form overlay free space	Binary data	4
4	Graphic free space	Binary data	4
5	Graphic total space	Binary data	4

4) Form Overlay Registration Information Request

The printer returns the form overlay registration information of the printer to the host by receiving this command.

(1) Command SOH (01H) + FO

(2) Return status format

STX (HEX 02H)
ETX (HEX 03H)

[STX] + Form overlay registration content +[ETX]

STX	Registration number	Registration name	ETX

(Total 20 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Registration number	01 - 99 (ASCII Code)	16
2	Registration name	Registration name (ASCII Code)	26

5) LAN Specification Information Request

The printer returns the LAN setting information of the printer to the host by receiving this command.

(1) Command SOH (01H) + LA

(2) Return status format

STX (HEX 02H)
ETX (HEX 03H)
(Total: 22 bytes)

[STX] +MAC address + IP address + Subnet mask + Default gateway + DHCP + [ETX]

STX	MAC Address	IP Address	Subnet Mask	Default gateway	DHCP	Reserve	ETX

(3) Return status list

No.	Item	Description	Number of bytes
1	MAC address (HEX)	Return MAC address that is set	6
2	IP address (HEX)	Return IP address that is set	4
3	Subnet mask (HEX)	Return Subnet mask that is set	4
4	Default gateway (HEX)	Return default gateway address that is set	4
5	DHCP	0 (00H) : Disable (Default) 1 (01H) : Enable	1
6	Reserve	0 (00H) Fixed.	1

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6) Wireless LAN information request

The printer returns the wireless LAN setting to the host by receiving this command.

* This is closed to the users.

(1) Command SOH (01H) + WZ

(2) Return status format

STX (HEX 02H)
ETX (HEX 03H)
(Total 389 bytes)

[STX] + wireless LAN information + [ETX]

STX	DHCP	Reserve	IP Address Settings	. . . . .	ETX

(3) Return status list

No.	Item	Description	Number of bytes
1	DHCP	0 (30H) : Disable 1 (01H) : Enable	1
2	Reserve	0 (30H) Fixed	1
3	IP Address Settings	000000000000 - 255255255255	12
4	Subnet Mask Settings	000000000000 - 255255255255	12
5	Gateway Address Settings	000000000000 - 255255255255	12
6	Raw Protocol Settings	0 (30H) : status 4 (CYC) 1 (31H) : status 4 (ENQ) 2 (32H) : status 3 3 (33H) : status 5	1
7	Socket Connection Timeout	0000 - 3600	4
8	FTP Timeout	010 - 900	3
9	LPD Timeout	010 - 900	3
10	Wireless LAN mode setting	0 (30H) : infrastructure mode (Infrastructure) 1 (31H) : Ad Hoc mode (Ad Hoc)	1
11	SSID Settings	1 - 32 characters (*1) When less than 32 characters are set in the SSID, it will be filled with 0 until it becomes 32 characters.	32
12	Channel Specification	01 - 13	2
13	Network authentication	0 (30H) : Open System 1 (31H) : Shared key 2 (32H) : WPA 3 (33H) : WPA2	1
14	WEP key setting	0 (30H) : Disable 1 (31H) : Enable	1
15	WEP key 1 setting	5 or 13 characters (*1) 10 or 26 digits in HEX (*3)	27
16	WEP key 2 settings	5 or 13 characters (*1) 10 or 26 digits in HEX (*3)	27
17	WEP key 3 settings	5 or 13 characters (*1) 10 or 26 digits in HEX (*3)	27
18	WEP key 4 settings	5 or 13 characters (*1) 10 or 26 digits in HEX (*3)	27
19	WEP Key Index	1 - 4	1
20	IEEE 802.1, authentication OFF/ON	0 (30H) :DISABLE 1 (31H) :ENABLE	1
21	IEEE 802.1x authentication setting	0 (30H) :LEAP 1(31H):EAP-TLS 2(32H):EAP-TTLS 3(33H):EAP-PEAP 4(34H):EAP-FAST	1
22	WPA/WPA2 Authentication setting	0 (30H) : PSK 1 (31H) : EAP	1
23	WPA/WPA2 Encryption Method setting	0 (30H) : TKIP 1 (31H) : AES	1
24	Advanced shared key	8 - 63 characters	63
25	EAP authenticated user name	1 - 64 characters (*1)	64
26	EAP Authentication password	1 - 32 characters (*1)	32
27	EAP password for secret key acquisition	1 - 32 characters (*1)	32
28	TTLS internal authentication	0 (30H) : PAP 1 (31H) : CHAP 2 (32H) : MSCHAP 3 (33H) : MSCHAPv2	1
29	TTLS server authentication	0 (30H) : OFF 1 (31H) : ON	1

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No.	Item	Description	Number of bytes
30	PEAP server authentication	0 (30H) : OFF 1 (31H) : ON	1
31	PAC file auto provisioning	0 (30H) : OFF 1 (31H) : ON	1
32	Enable/Disable advanced authentication	0 (30H) : DISABLE 1 (31H) : ENABLE	1

(*1) 0x20 - 0x7E However, "," (comma) is excluded.
(*2) The setting range will vary depend on the regional code
(*3) 0x20 - 0x7E
(*4) "0" - "9", "A" - "F" However, "," (comma) is excluded.

7) Wireless LAN field intensity information request

The printer returns the wireless LAN field intensity information to the host by receiving this command.
(1) Command SOH (01H) + WI
(2) Return status format

[STX] + field intensity + [ETX]

STX	Field intensity	ETX

STX (HEX 02H)
ETX (HEX 03H)
(Total 3 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Field intensity	X: Wireless LAN kit is not installed/Failed to acquire field intensity 0 (30H) : - Less than Signal Level 1 (not connected) 1 (31H) : Signal Level 1 - Less than Signal Level 2 (weak) 2 (32H) : Signal Level 2 - Less than Signal Level 3 (medium) 3 (33H) : Signal Level 3 - (strong)	1

8) Status 5 setting information request

The printer returns the status 5 setting information to the host by receiving this command.
(1) Command SOH (01H) + CR
(2) Return status format

[STX] + Status 5 setting information + [ETX]

STX	BCC check	, (2CH fixed)	Item No check	ETX

STX (HEX 02H)
ETX (HEX 03H)
(Total 5 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	BCC check	0 (30H) : Disabled BCC check 1 (31H) : Enabled BCC check	1
2	, (comma)	2CH (fixed)	1
3	Item No. check	0 (30H) : Disabled item No. check 1 (31H) : Enabled item No. check	1

9) Wireless LAN interface information request

The printer returns the wireless LAN interface setting to the host by receiving this command.
(1) Command SOH (01H) + H5
(2) Return status format

[STX] + wireless LAN interface setting information+[ETX]

STX	Wireless LAN interface setting information	ETX

STX (HEX 02H)
ETX (HEX 03H)
(Total 3 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Wireless LAN interface setting information	00H : 2 port connection/cycle response (status 4) 01H : 2 port connection/ENQ response (status 4) 02H : 1 port connection/ENQ response (status 3) 03H : 1 port connection/ENQ response (status 5)	1

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10) Association Threshold information request

The printer returns the threshold that starts the association process to the host by receiving this command.

(1) Command SOH (01H) + wa

(2) Return status format

[STX] + Association Threshold setting information + [ETX]

STX	Association Threshold setting information	ETX

STX (HEX 02H)
ETX (HEX 03H)
(Total 3 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Association Threshold setting information	35 - 94	2

11) Roaming Threshold information request

The printer returns the threshold that starts roaming process to the host by receiving this command.

(1) Command SOH (01H) + wr

(2) Return status format

[STX] + Roaming Threshold setting information + [ETX]

STX	Roaming Threshold setting information	ETX

STX (HEX 02H)
ETX (HEX 03H)
(Total 3 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Roaming Threshold setting information	35 - 94	2

12) Work shifts information request

The printer returns the work shift information to the host by receiving this command.

(1) Command SOH (01H) + WS

(2) Return status format

[STX] + Work shift information + [ETX]

STX	Shift code	Shift start time	Shift name	ETX

STX (HEX 02H)
ETX (HEX 03H)
(Total 8 to 23 bytes)

(3) Return status list

No.	Item	Description	Number of bytes
1	Shift code	"1" to "3"	1
2	Shift start time	"0000" to "2359"	4
3	Shift name		1 - 16

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2.3 READY/BUSY

In this protocol, print data are controlled by a hardware signal only without software procedures.
Refer to "3 RS-232C" for details.

2.4 XON/XOFF

This communication protocol tells the printer status if it can receive any data or not to the host by sending "XON" (HEX 11H) or "XOFF" (HEX 13H) to the signal line.
Refer to "3 RS-232C" for details.

2.5 Status 3

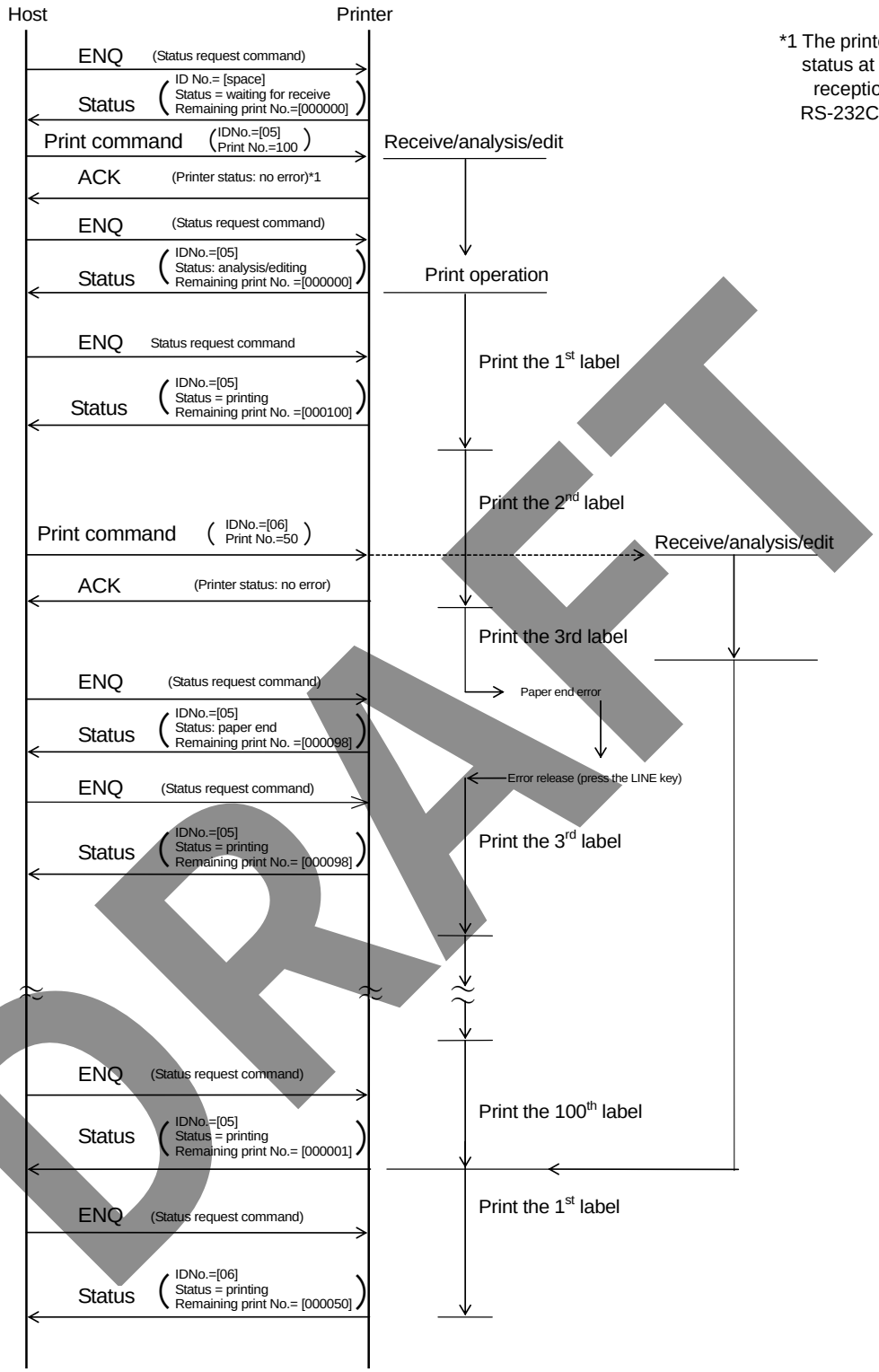
This communication protocol returns the status corresponding to the request command from the host computer so that the host computer can control printer status.
Refer to [2.2.2 Return status of Status 3] for details of the request command and the return status.

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2.5.1 Return Sequence

Refer to [6.14 **Printer status**] when using LAN/wireless LAN interface.

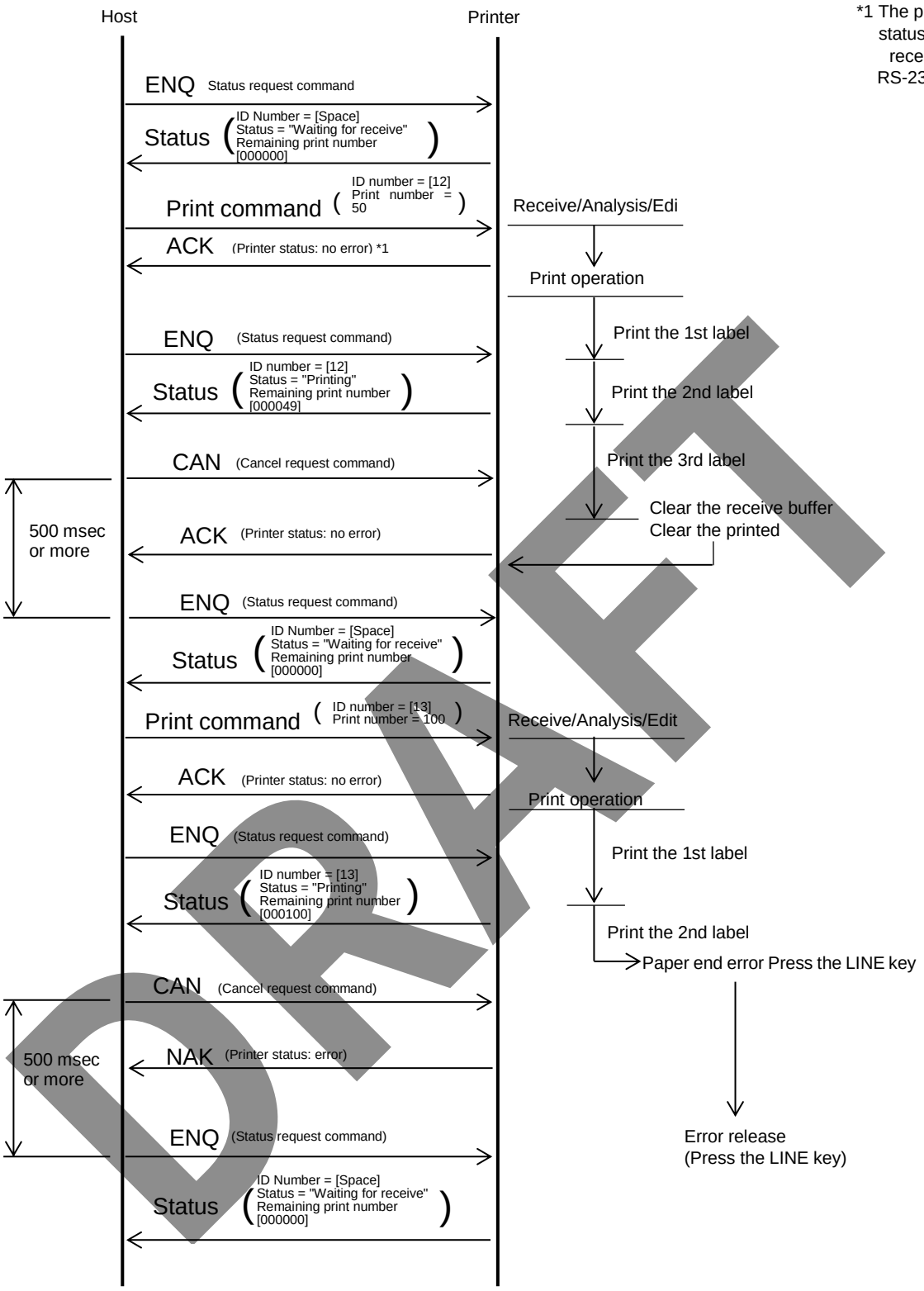
1) Normal



*1 The printer will return the status at print command reception when using RS-232C and Bluetooth.

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2) Cancel request command

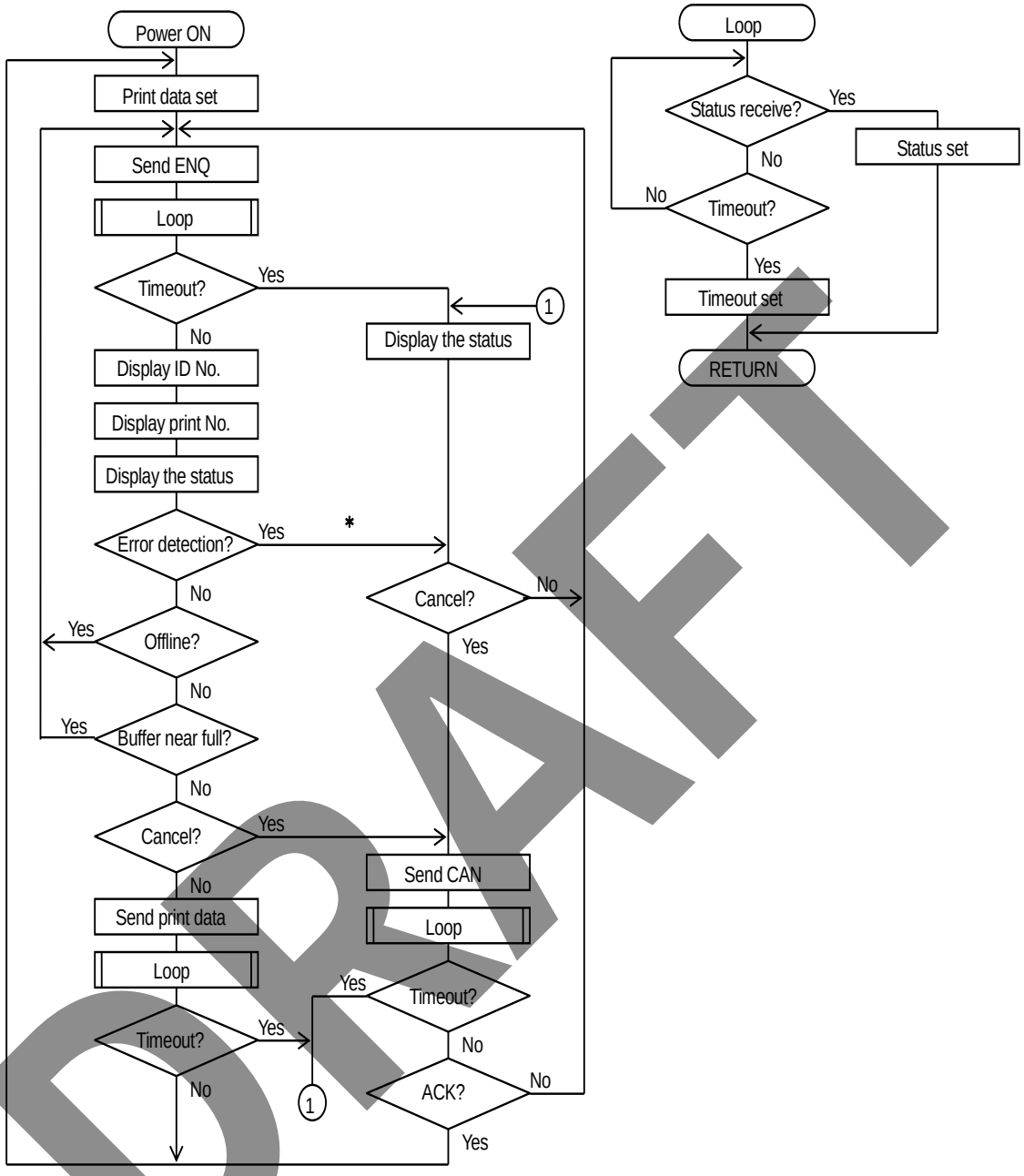


*1 The printer will return the status at print command reception when using RS-232C and Bluetooth.

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2.5.2 Reference Flowchart

See the flowchart below for programming on the host side.



***** When detecting an error in the printer, make sure to send the subsequent print data after releasing the error by sending ENQ.

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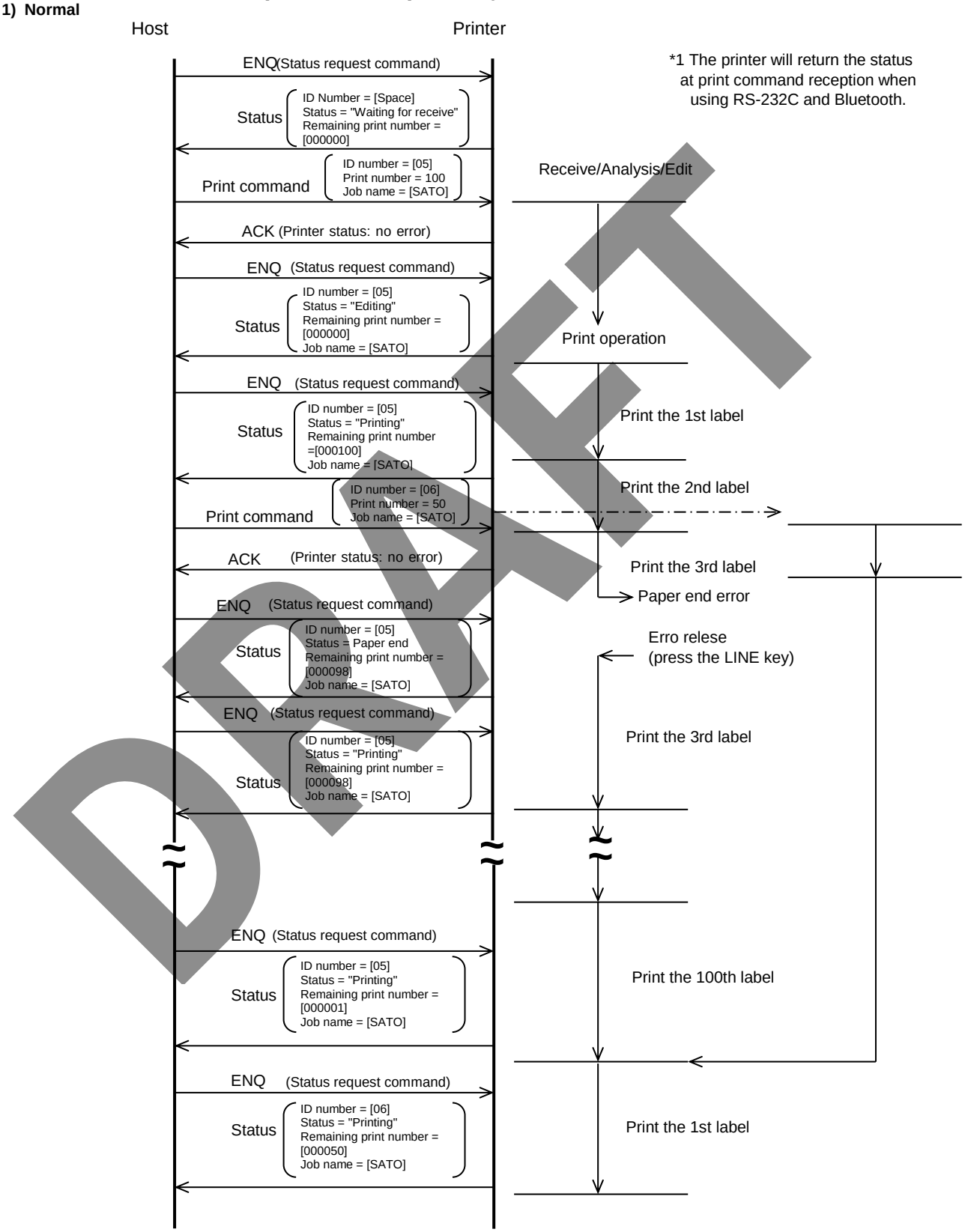
2.6 Status 4

This communication protocol is designed for the purpose of controlling print status in the host, and the printer returns the status by receiving request command from the host.
Refer to [2.2.3 **Return status of Status 4**] and [2.2.5 **Other return status** (Common to Status 3, Status 4, and Status 5)] for details of the request command and the return status.

2.6.1 Return Sequence

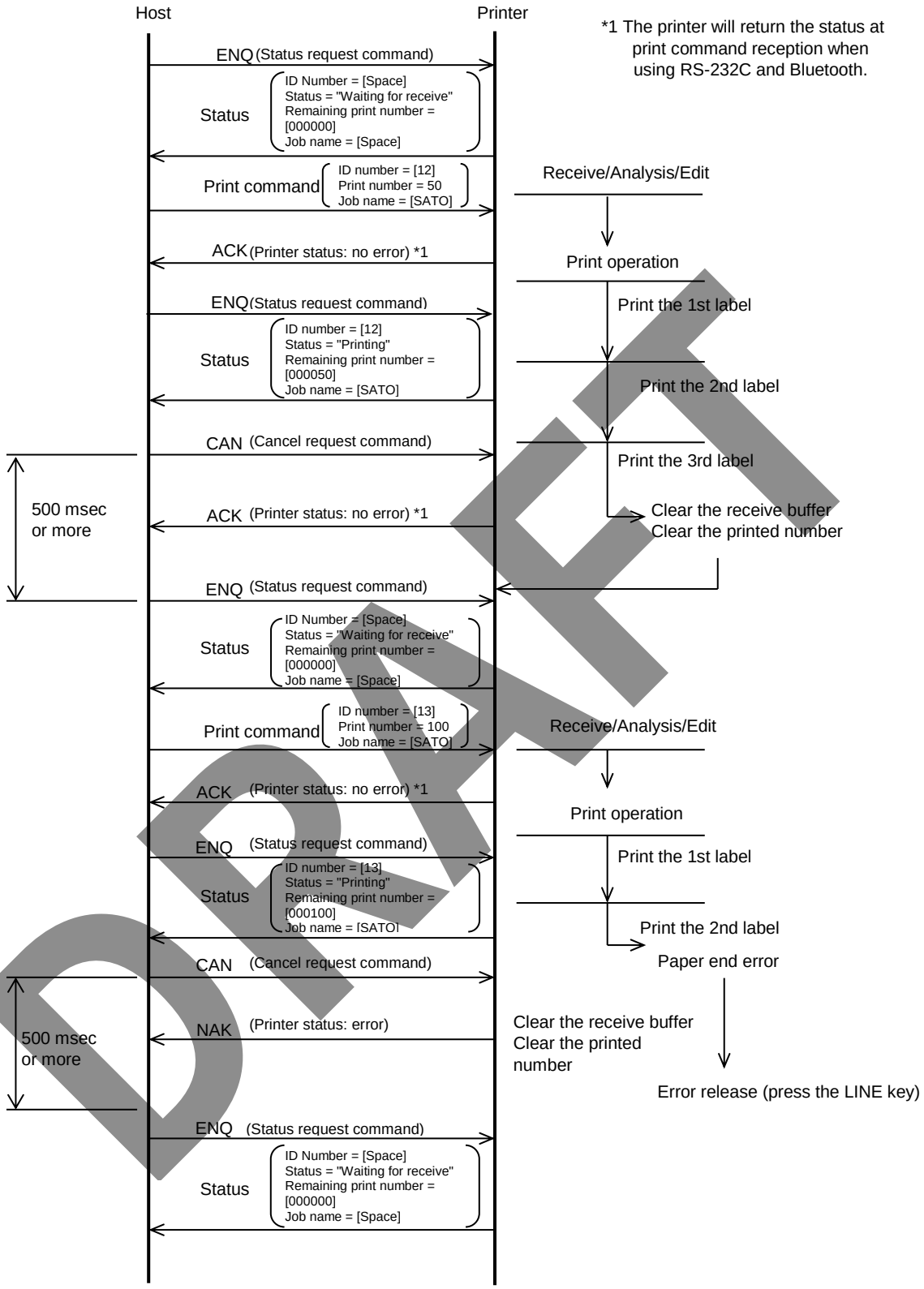
Refer to [6.14 **Printer status**] when using LAN/wireless LAN interface.

1) Normal



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2) Cancel request command



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2.7 Status 5

This communication protocol is designed for the purpose of controlling print status in the host, and there are several functions. This printer's receive mode in this protocol is the multiple-receive.

2.7.1 Receive buffer control

There are following two factors for detecting buffer near full due to information such as receive, print, cancel are controlled by each items.

Cause of receive buffer near full

(1) Buffer near full occurs when the remaining capacity of receive buffer (2.95MB) becomes 0.95 MB.
(2)Buffer near full occurs when the remaining capacity of history buffer (500 items) becomes 50 items.

Factors to release receive buffer near full

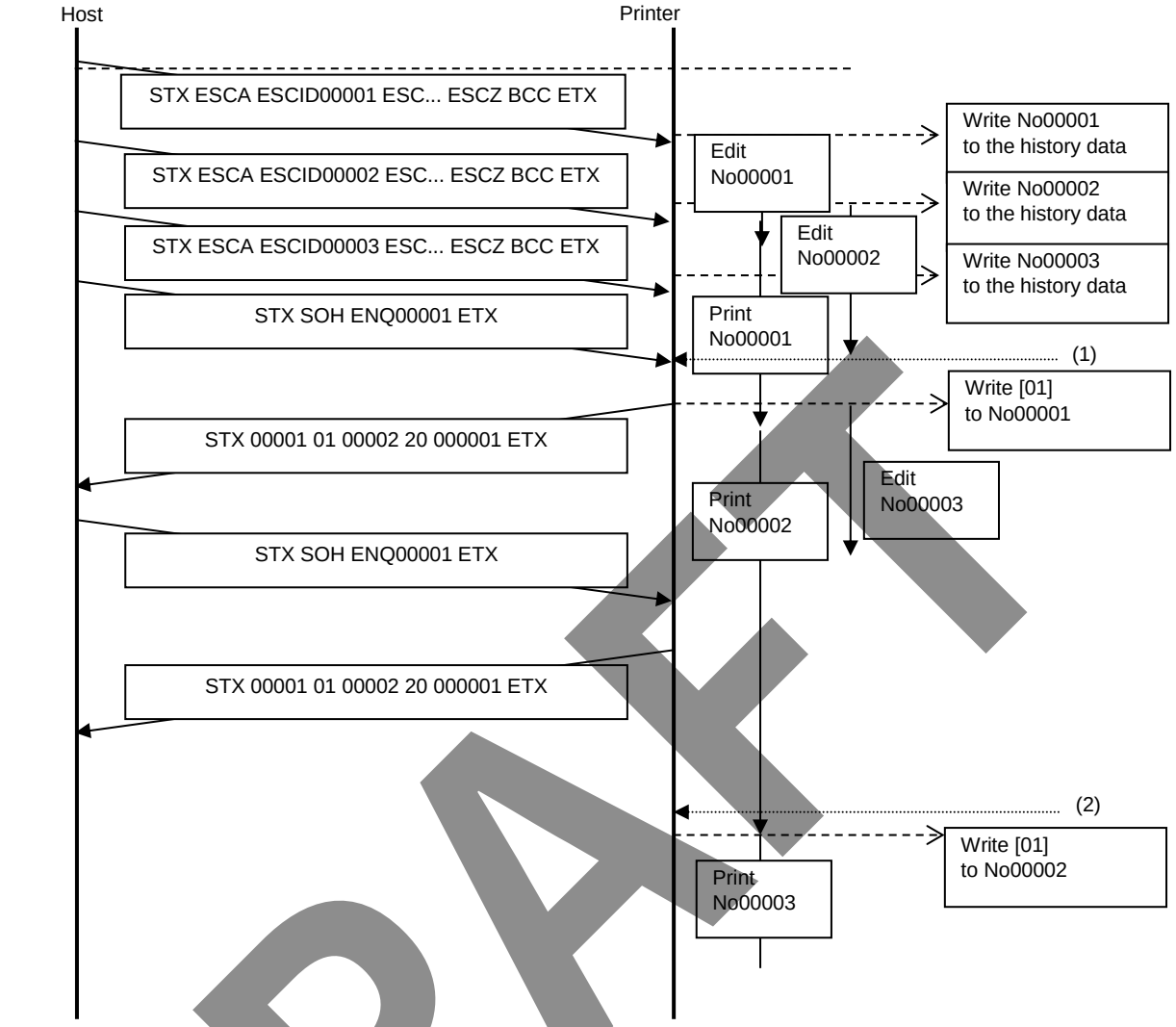
(1)Receive buffer near full is released when remaining capacity of the receive buffer becomes 1.95 MB or more.
(2)Receive buffer near full is released when remaining capacity of the history buffer becomes 200 items or more.

*Buffer-over occurs when the history buffer becomes full state (more than 499 items).
*Each history information is handled as an empty area when item analysis is finished.

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2.7.2 Return Sequence

1) Normal process (1)



History status of (1)

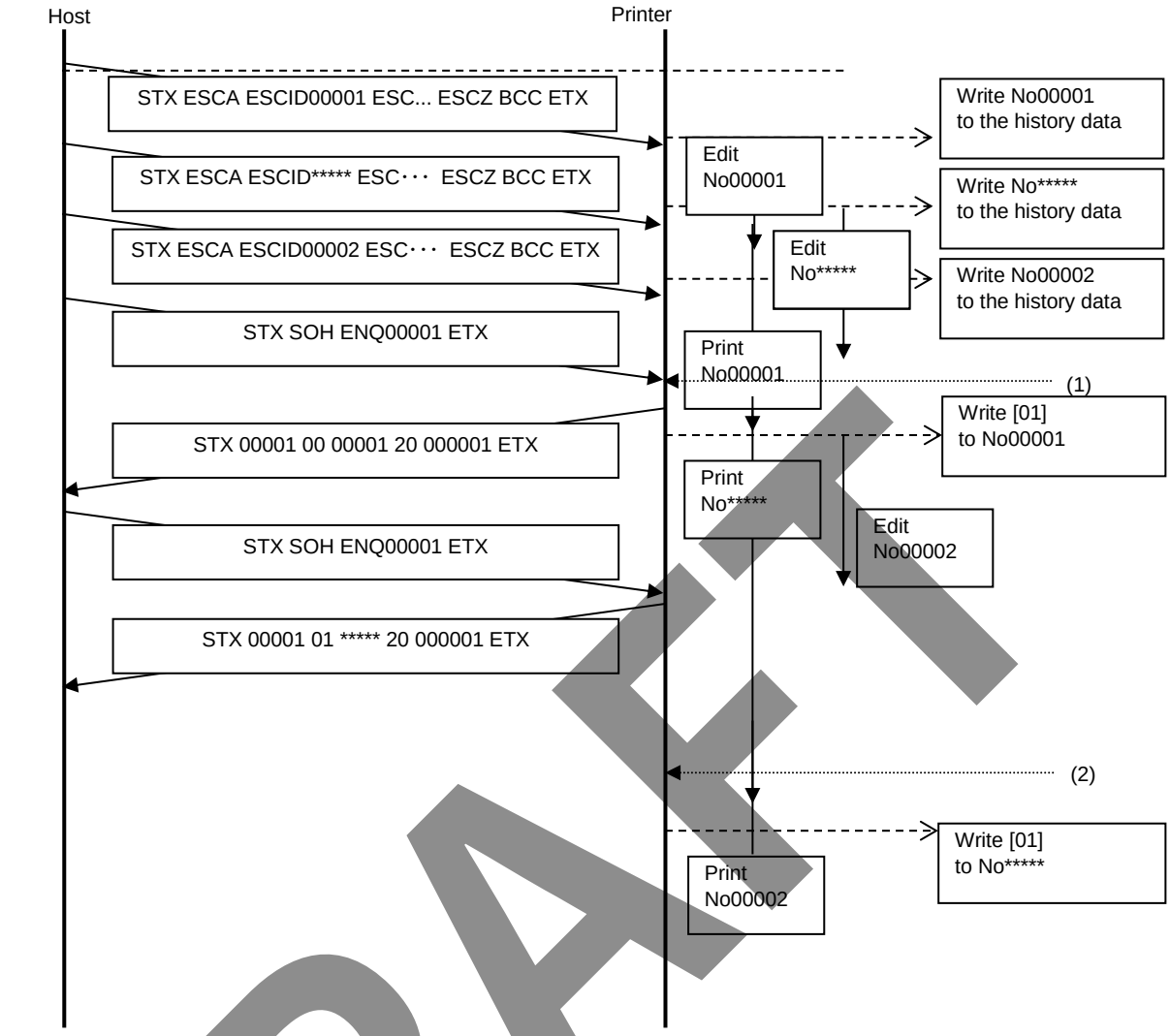
00001 00
00002 00
00003 00

History status of (2)

00001 01
00002 00
00003 00

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2) Normal process (2)



History status of (1)

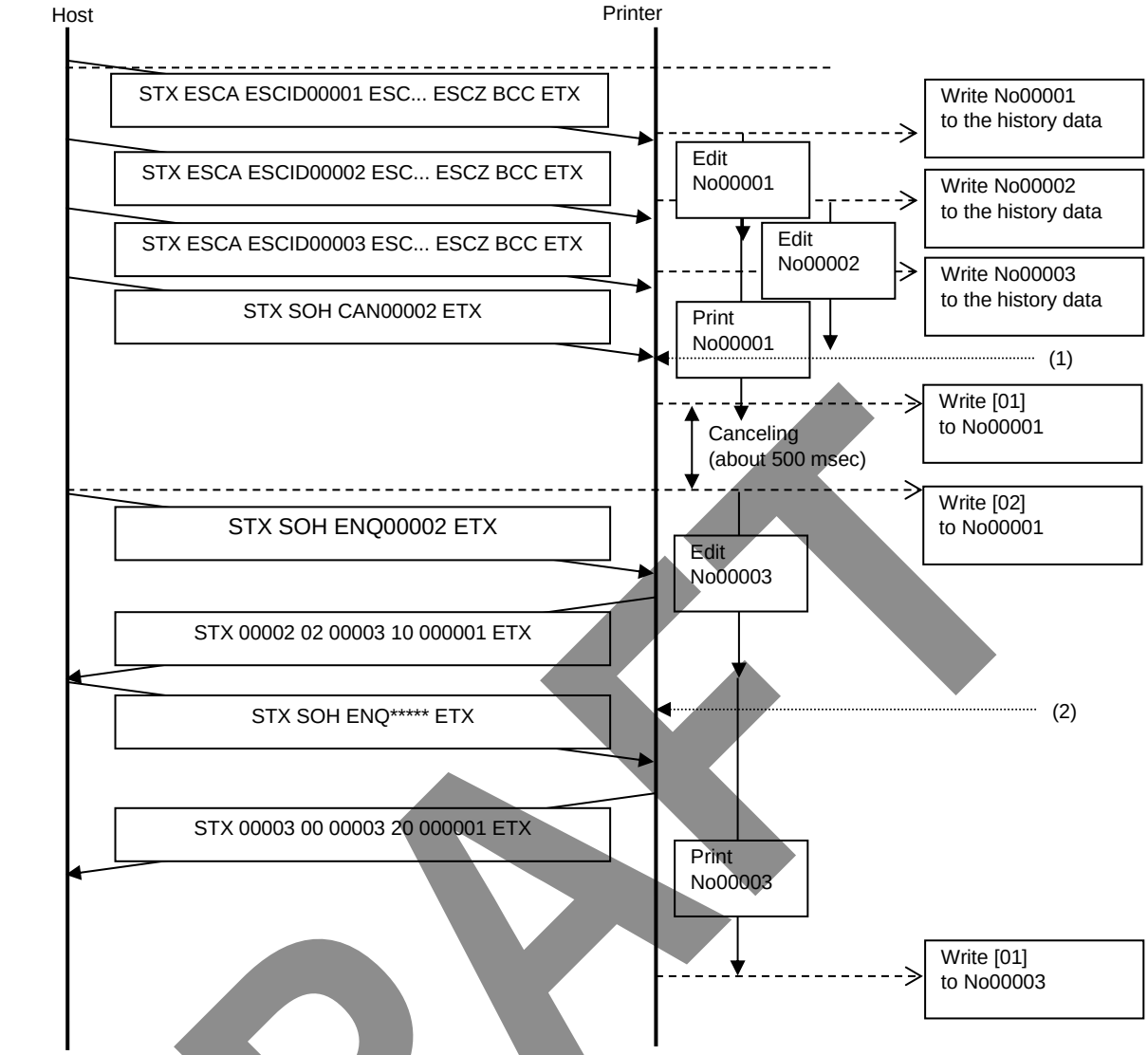
00001 00
***** 00
00002 00

History status of (2)

00001 01
***** 00
00002 00

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3) Cancel process (1)



History status of (1)

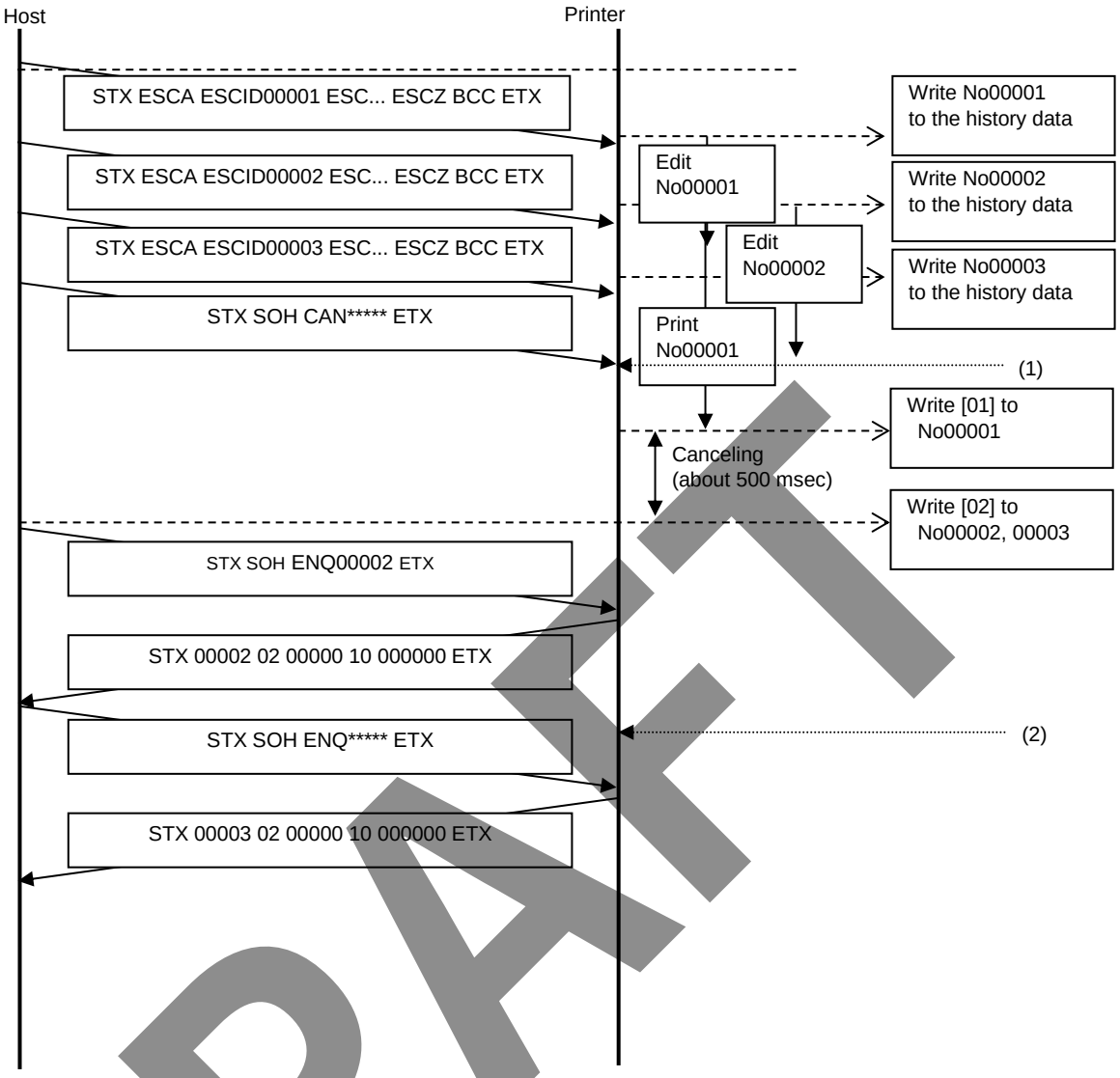
```
00001 00
00002 02
00003 00
```

History status of (2)

```
00001 01
00002 02
00003 00
```

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4) Cancel process (2)



History status of (1)

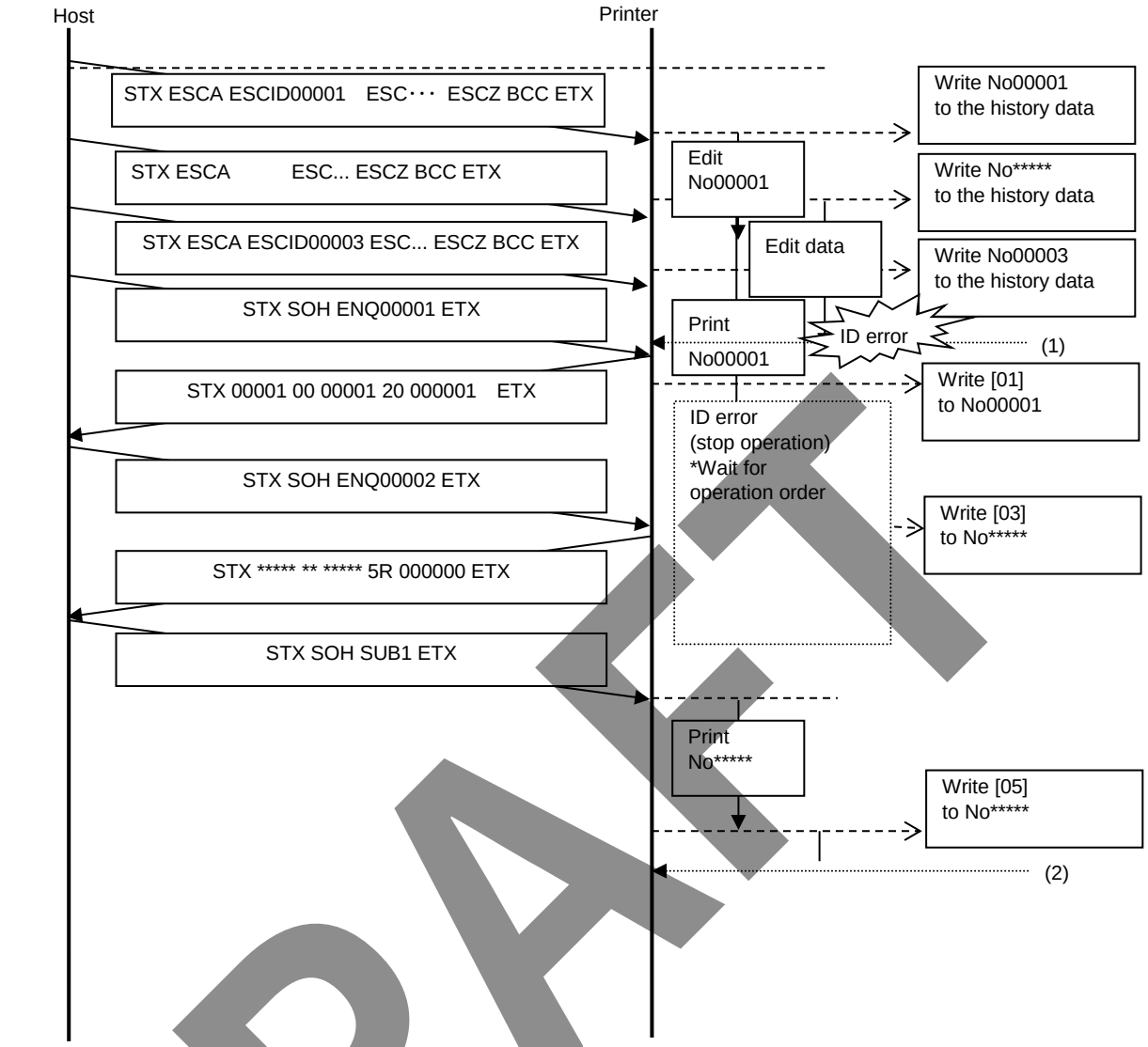
00001 00 00002 02 00003 02

History status of (2)

00001 01 00002 02 00003 02

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5) Error process (1)



History status of (1)

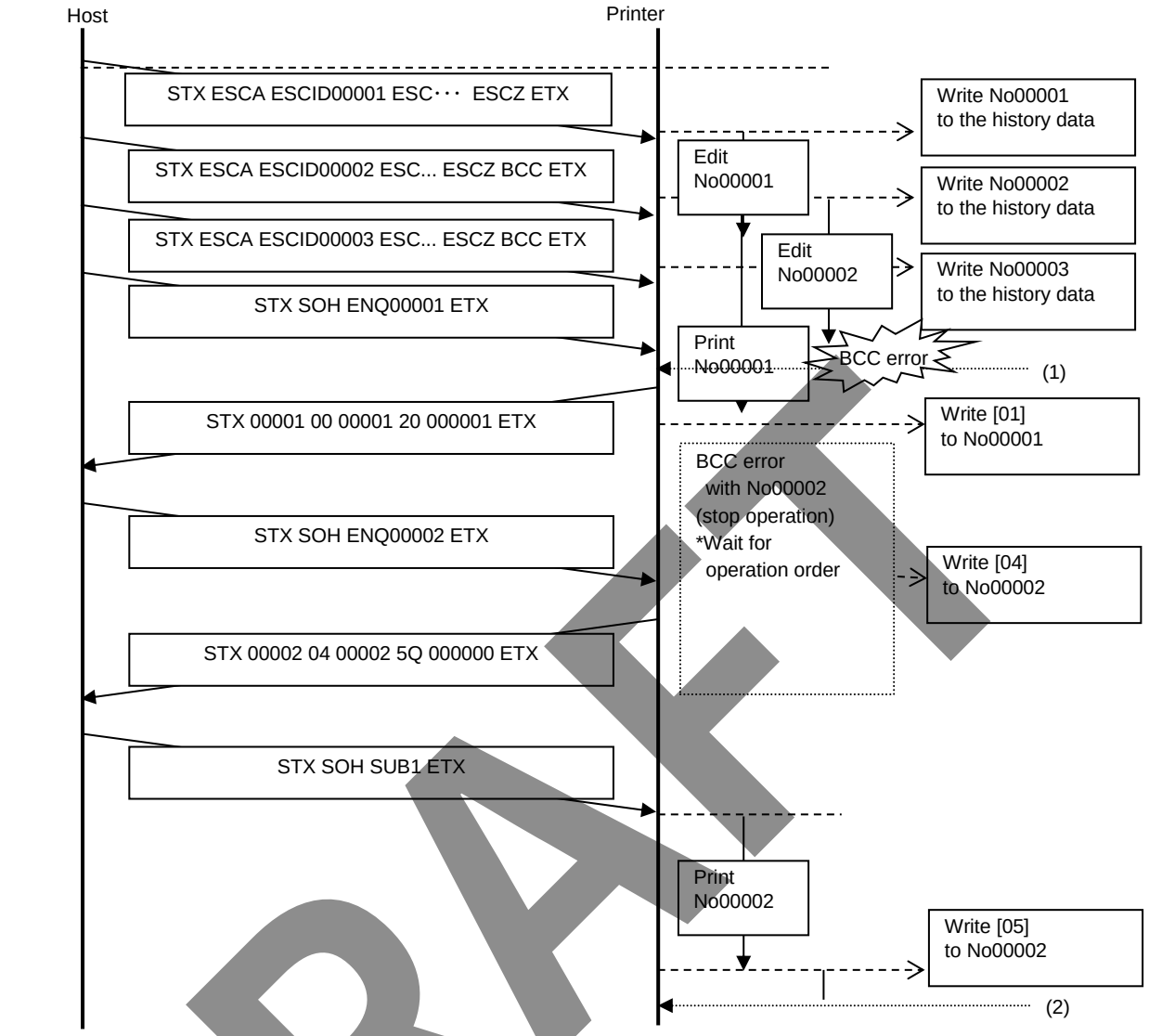
```
00001 00
***** 03
00003 00
```

History status of (2)

```
00001 01
***** 05
00003 00
```

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6) Error process (2)



History status of (1)

0 00001 00
0 00002 04
0 00003 00

History status of (2)

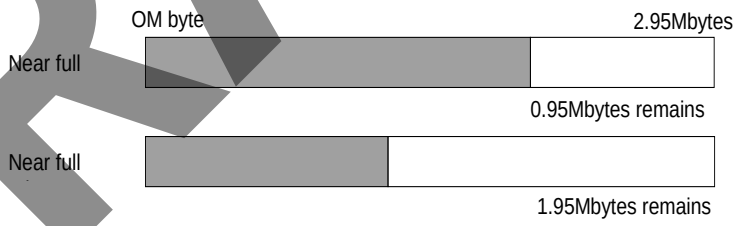
0 00001 01
0 00002 05
0 00003 00

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3 RS-232C

3.1 Basic Specifications

This interface complies with the RS-232C standard.
The communication can be configured on the communication setting mode of the printer or printer setting tool.

<table>
<tr><td>Interface</td><td>
</td></tr>
<tr><td>Communication setting</td><td>1) Setting range on the communication setting mode
<table>
<tr><th>Item</th><th>Setting value</th><th>Default Value</th></tr>
<tr><td>Data bit length</td><td>7,8 (bits)</td><td>8 bits</td></tr>
<tr><td>Parity bit</td><td>NONE, ODD, EVEN</td><td>NONE</td></tr>
<tr><td>Stop bit</td><td>1, 2(Bits)</td><td>1 bit</td></tr>
<tr><td>Baud rate</td><td>2400, 4800, 9600, 19200, 38400, 57600, 115200 (bps)</td><td>19200 bps</td></tr>
<tr><td>Protocol</td><td>READY/BUSY, XON/XOFF, Status 2, Status 3
Status 4, Status 5
Refer to 2 Communication protocol for details.</td><td>Status 5</td></tr>
</table>
1) Single item or multiple item receive can be selected on the communication setting mode when READY/BUSY or XON/XOFF is configured.
2) Setting of compatibility mode can be done in the service mode.</td></tr>
<tr><td>Synchronization system</td><td>Asynchronous communication method</td></tr>
<tr><td>Receive buffer size</td><td>2.95 MB

</td></tr>
<tr><td>Code</td><td>ASCII (7 bits) Graphic (8 bits)</td></tr>
<tr><td>Connector</td><td>At the printer DSUB9 pin (female terminal)
At the cable DSUB9 pin (male terminal)
Cable length shorter than 5 (m)</td></tr>
<tr><td>Transmission format</td><td>
<table>
<tr><td>Start</td><td>b1</td><td>b2</td><td>b3</td><td>b4</td><td>b5</td><td>b6</td><td>b7</td><td>b8</td><td>Stop</td></tr>
</table>
*In case of 7 bits unit, b3 will be omitted.</td></tr>
<tr><td>Signal level</td><td>High level: +5 - +12V
Low level: -5 - -12V</td></tr>
</table>

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3.2 READY/BUSY

In this protocol, print data are controlled by a hardware signal only without software procedures. Single item receive or multiple receive can be switched on the interface mode of the printer.

When the print data (STX <A>~ <Z> ETX) has sent from the host in the conditions below, the received data will not be accurate.

1) When the printer is in offline state.
2) When an error has occurred in the printer.

3.2.1 Connecting diagram

1) DB-9P

Printer			Host	
CD	1		1	CD
RD	2	———————	3	SD
SD	3	———————	2	RD
ER	4	———————	6	DR
SG	5	———————	5	SG
DR	6	———————	4	ER
RS	7	———————	8	CS
CS	8	———————	7	RS

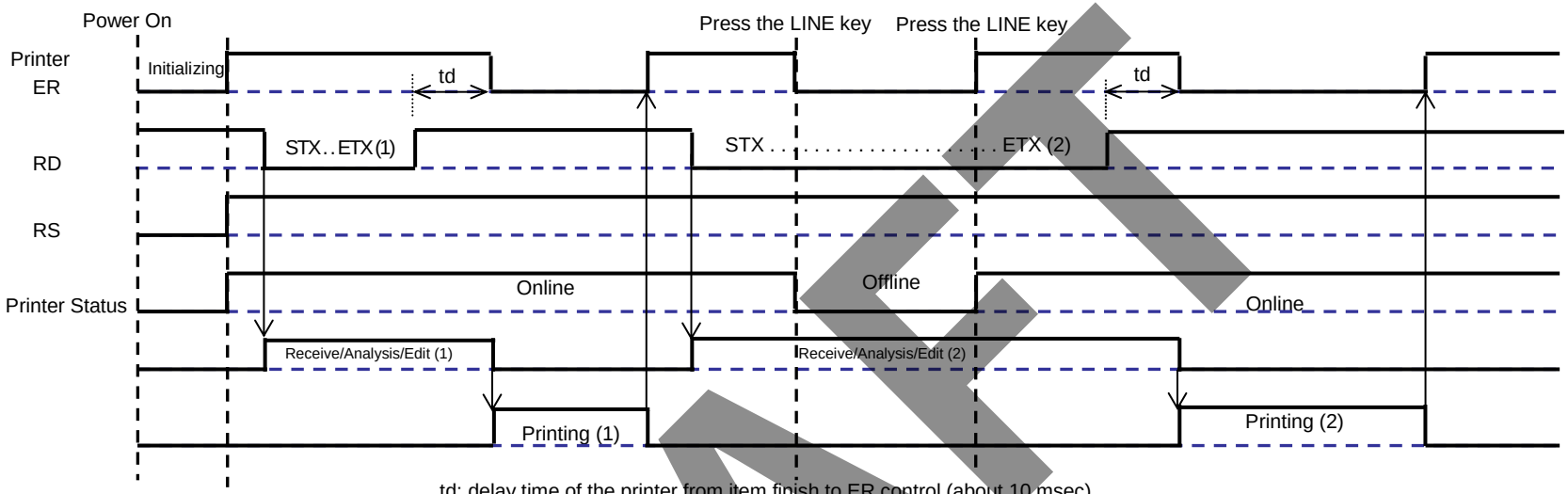
3.2.2 Explanation of input/output signal

Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
4	ER	Output	Data terminal ready
5	SG	—	Signal ground
6	DR	Input	Data set ready
7	RS	Output	Send request
8	CS	Input	Clear to send

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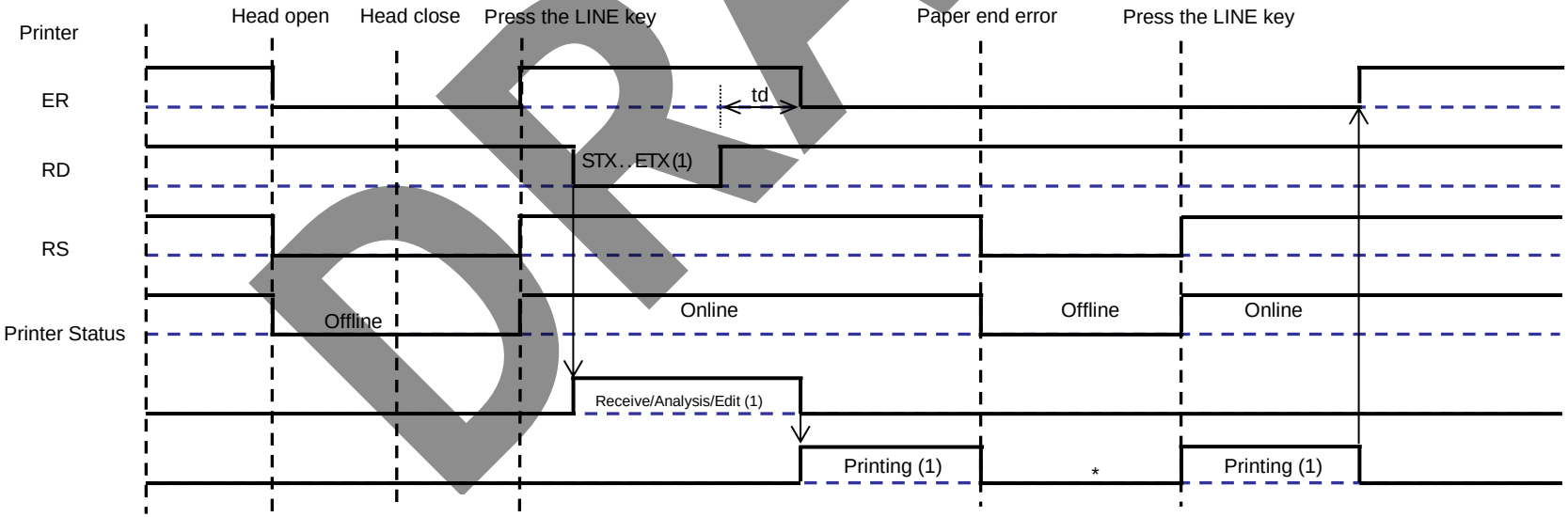
3.2.3 Timing chart of single item receive

1) Normal process



td: delay time of the printer from item finish to ER control (about 10 msec)

2) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.

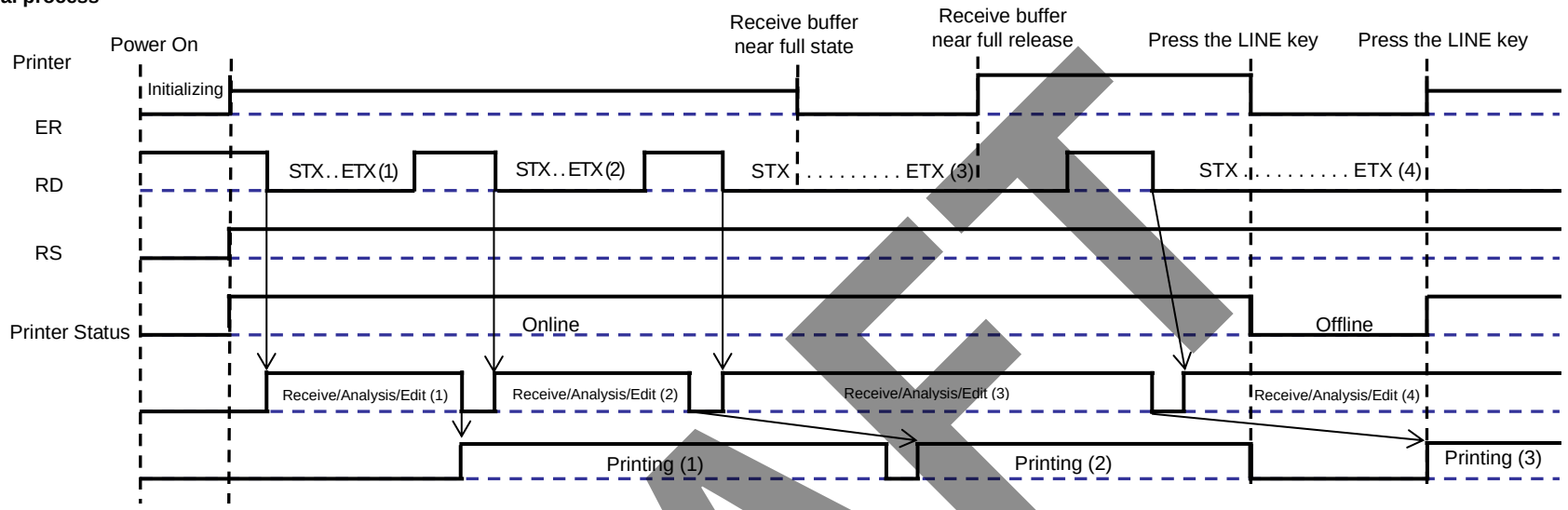
Note: (1) The paper end error will be released when the head is closed.

(2) RS signal will be Low at the head open error detection, and Hi at the offline state.

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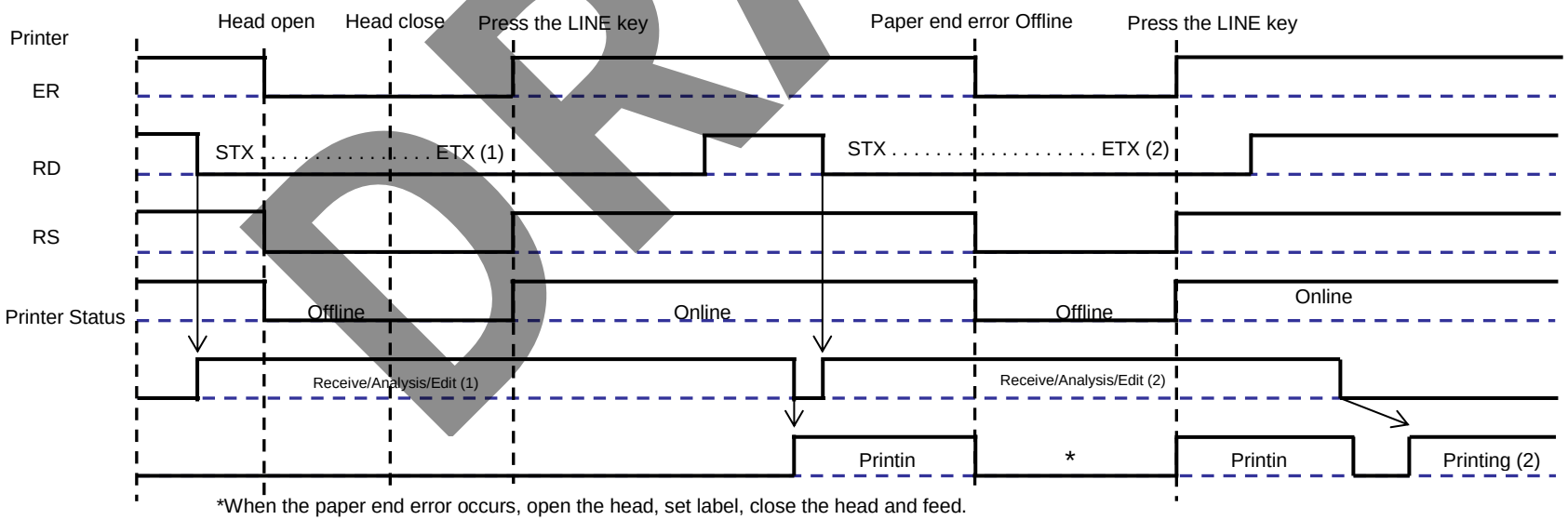
3.2.4 Timing chart of multiple receive

1) Normal process



Note: it is possible to send data during printing in the multiple receive mode.

2) Error process



*When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

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3.3 XON/XOFF

This communication protocol tells the printer status if it can receive any data or not to the host by sending "XON" (HEX 11H) or "XOFF" (HEX 13H) to the signal line. Single item receive or multiple receive can be switched on the interface mode of the printer.

When the print data (STX <A>~ <Z> ETX) has sent from the host in the conditions below, the received data will not be accurate.
1) When the printer is in offline state.
2) When an error has occurred in the printer.

3.3.1 Connecting diagram

1) DB-9P

Printer			Host	
RD	2	———	3	SD
SD	3	———	2	RD
SG	5	———	5	SG

*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host. Please confirm the user's guide of the host system.

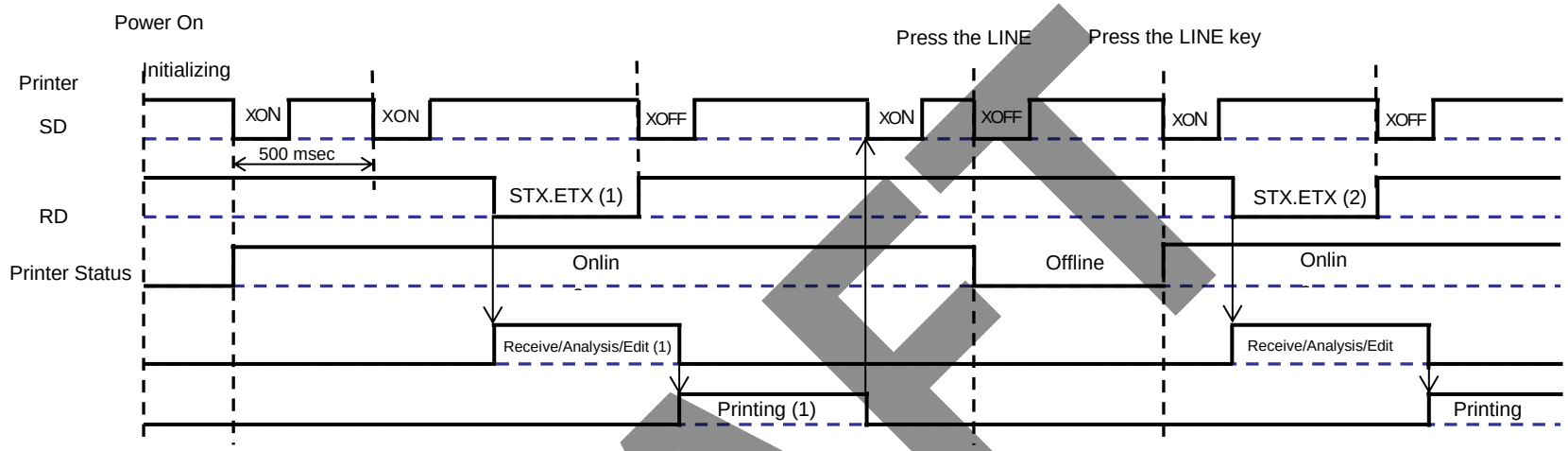
3.3.2 Explanation of input/output signal

Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	-	Signal ground

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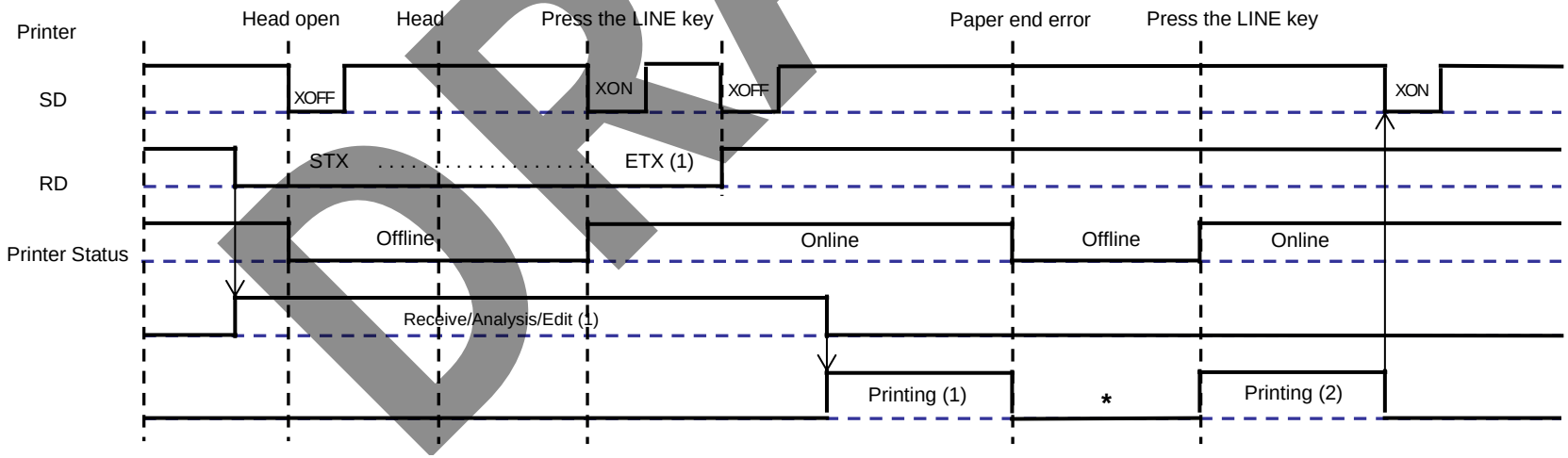
3.3.3 Timing chart of single item receive

1) Normal process



Note: the printer will be polled by XON at intervals of 500 msec from the initializing to the first data reception.

2) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.

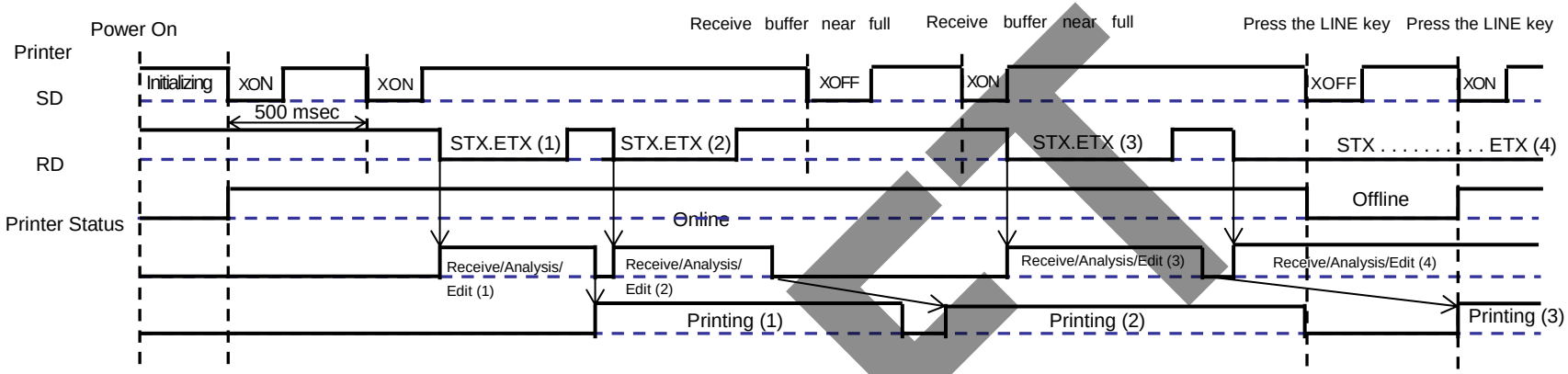
Notes: (1) The paper end error will be released when the head is closed.

(2) XOFF will be sent when data is received during an error.

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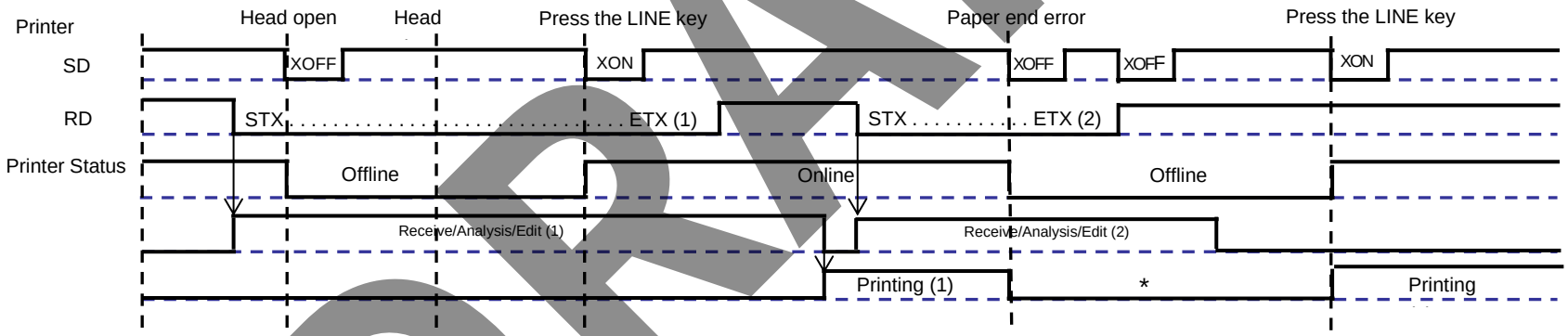
3.3.4 Timing chart of multiple receive

1) Normal process



Note: The printer will be polled by ON at intervals of 500 msec from the initializing to the first data reception.

2) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.

Notes: (1) The paper end error will be released when the head is closed.

(2) XOFF will be sent when data is received during an error.

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3.4 Printer Status 5 Return

This communication protocol is designed for the purpose of controlling print status in the host, and there are several functions. This printer's receive mode in this protocol is the multiple-receive.

3.4.1 Connecting diagram

1) DB-9P

Printer			Host	
RD	2	———————	3	SD
SD	3	———————	2	RD
SG	5	———————	5	SG

*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host. Please confirm the user's guide of the host system.

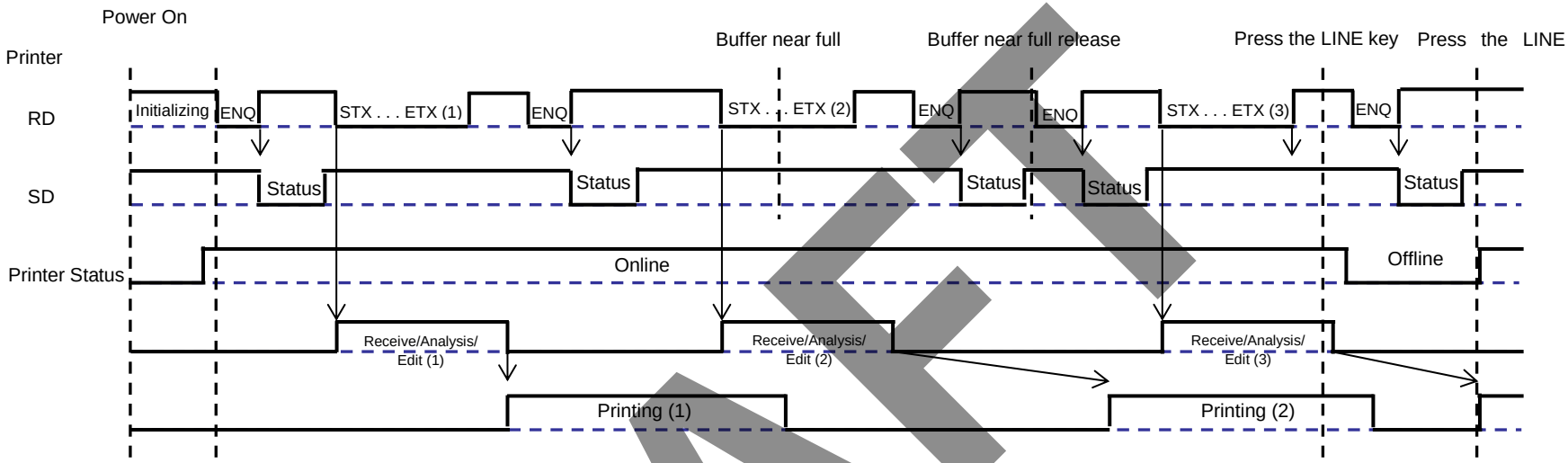
3.4.2 Explanation of input/output signal

Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	-	Signal ground

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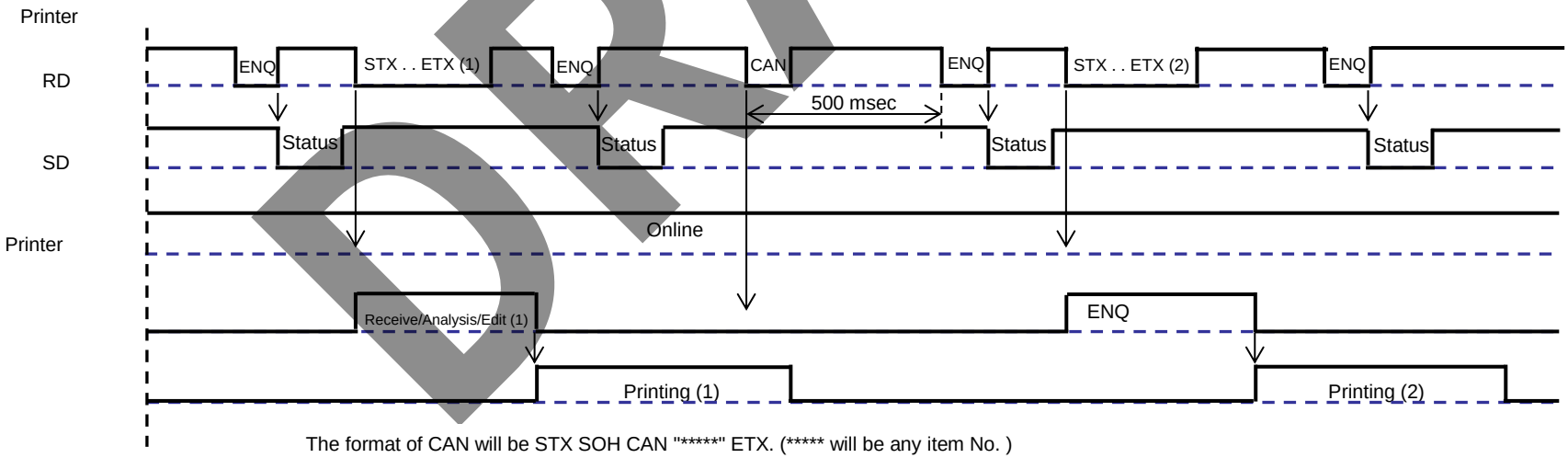
3.4.3 Timing Chart

1) Normal process



The format of ENQ will be STX SOH ENQ "*****" ETX. (***** will be any item No.)
Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX). By sending ENQ,
The status may not be returned or there may be print error.

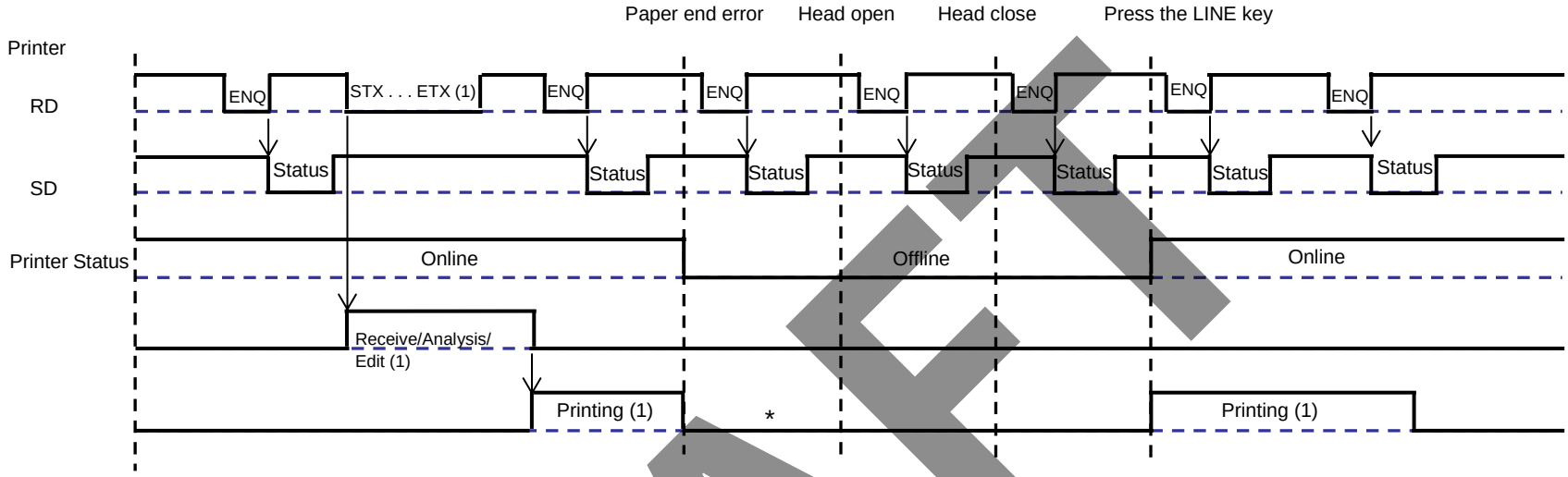
2) Cancel process



The format of CAN will be STX SOH CAN "*****" ETX. (***** will be any item No.)
After sending CAN, please wait about 500 msec before sending the next data.
Avoid sending CAN while sending the print data (STX <A> - <Z> ETX). With the above condition, the job may not be canceled or the item may not be printed correctly.

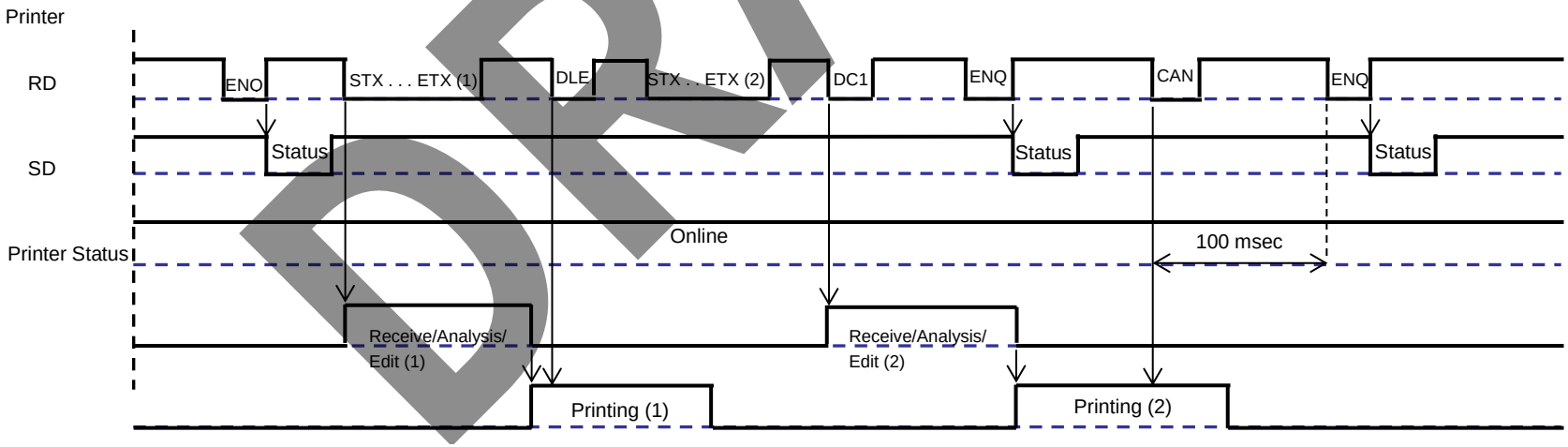
DRAFT

3) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

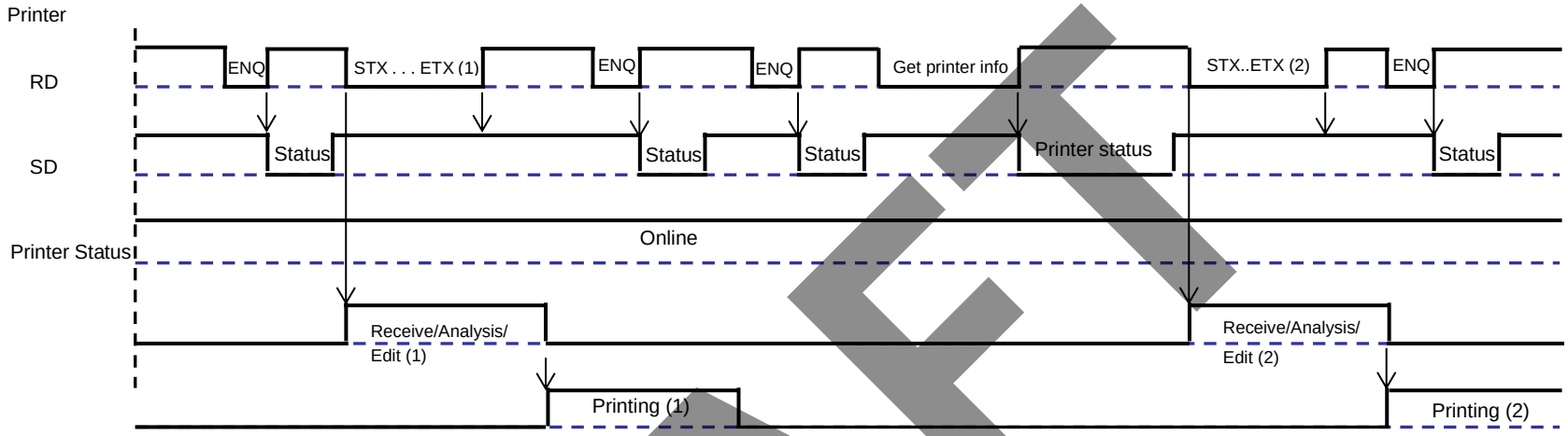
4) Print pause, print resume process



The format of DLE will be STX SOH DLE ETX.
The format of DC1 will be STX SOH DC1 ETX.

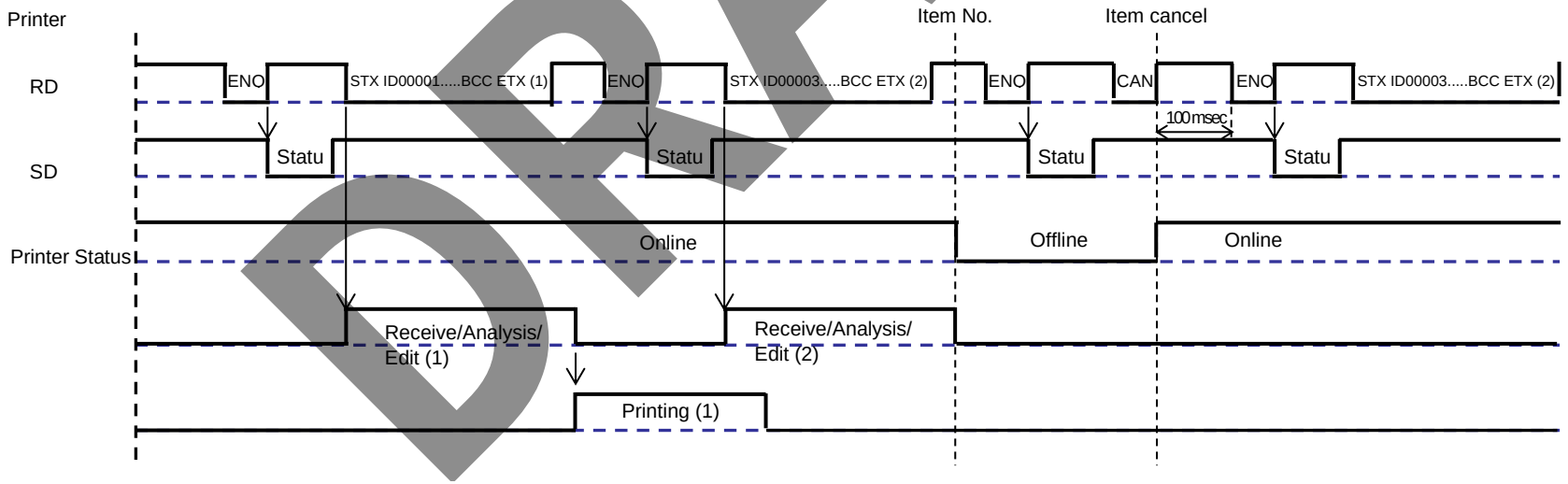
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5) Information request command process



Note: Do not send status request commands during printing.

6) Item No. error (BCC error) process



Note: Do not send status request commands during printing.

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3.5 Status 4

This communication protocol is designed for the purpose of controlling print status in the host, and the printer returns the status by receiving request command from the host.
The printer returns the status after receiving the status request command.
This printer's receive mode in this protocol is the multiple-receive.

3.5.1 Connecting diagram

1) DB-9P

Printer			Host	
RD	2	———————	3	SD
SD	3	———————	2	RD
SG	5	———————	5	SG

*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host.
Please confirm the user's guide of the host system.

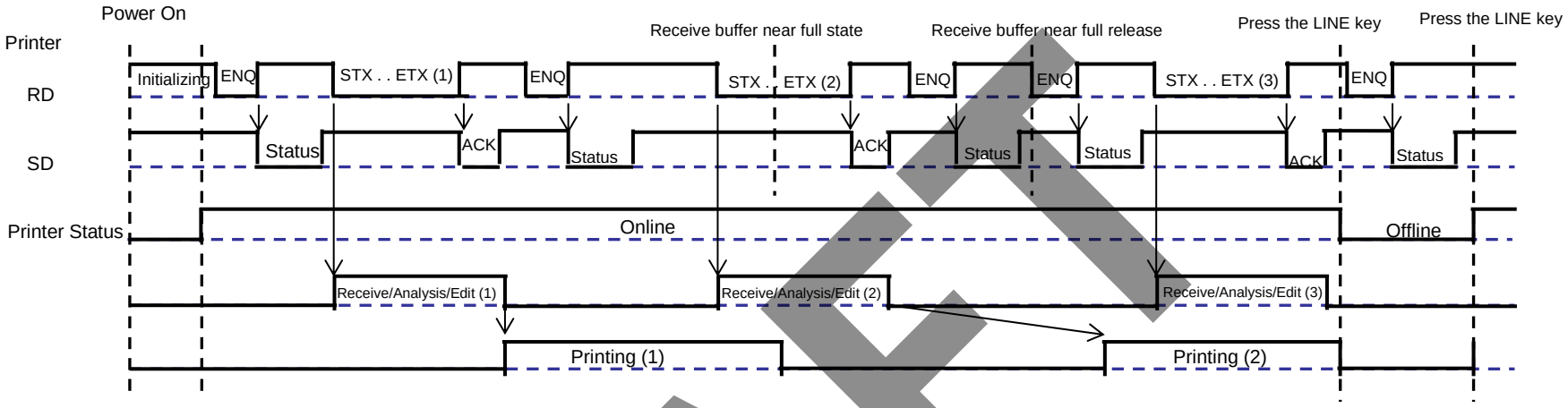
3.5.2 Explanation of input/output signal

Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	-	Signal ground

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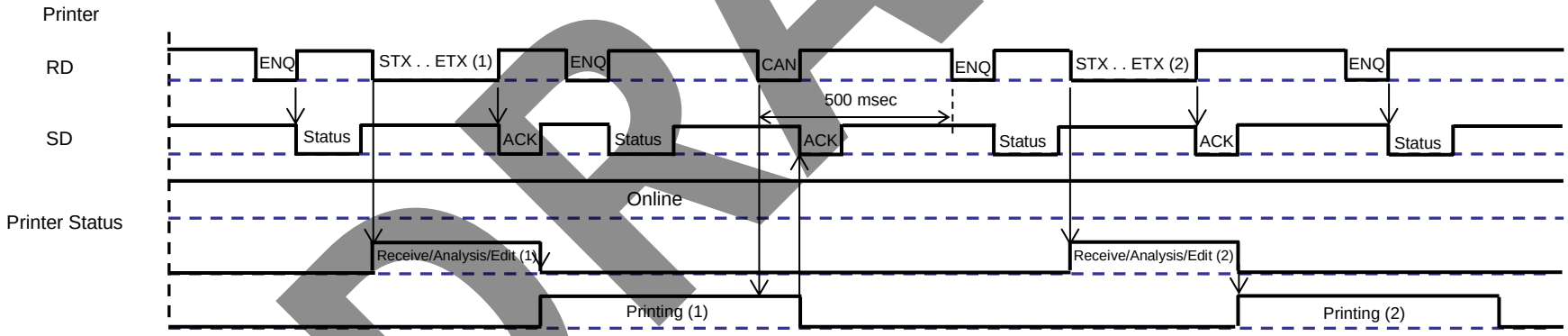
3.5.3 Timing Chart

1) Normal process



Note: Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX).
This may cause return status error or print error.

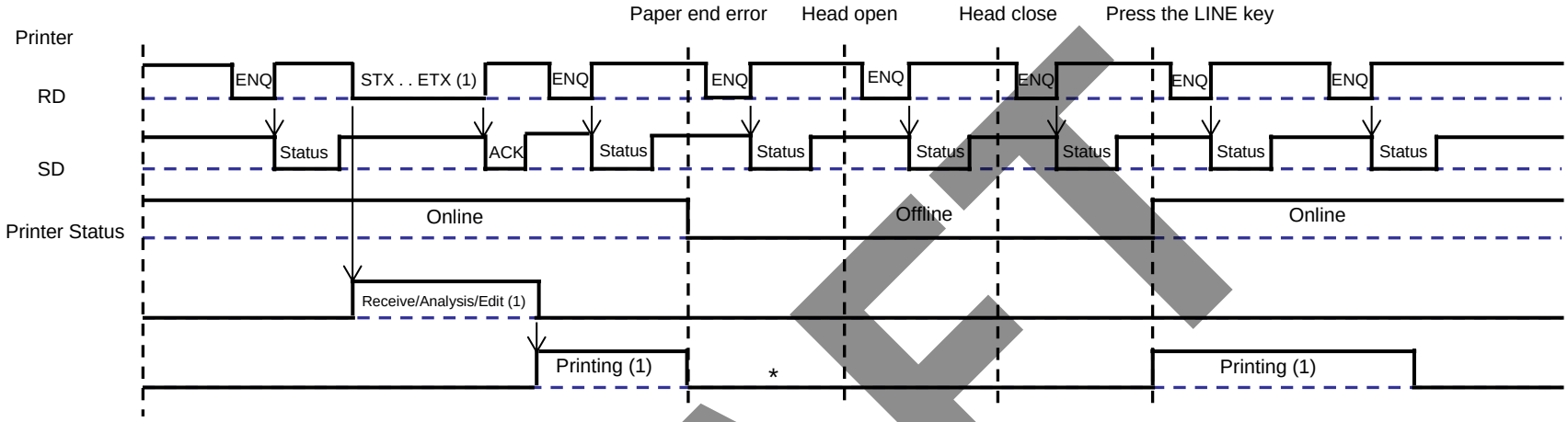
2) Cancel process



Note: When the cancel request command has sent, wait more than 500 ms before sending the next data.
Avoid sending CAN while sending the print data (STX <A> - <Z> ETX). This may cause cancel error or print error.
With the above condition, the job may not be canceled or the item may not be printed correctly.

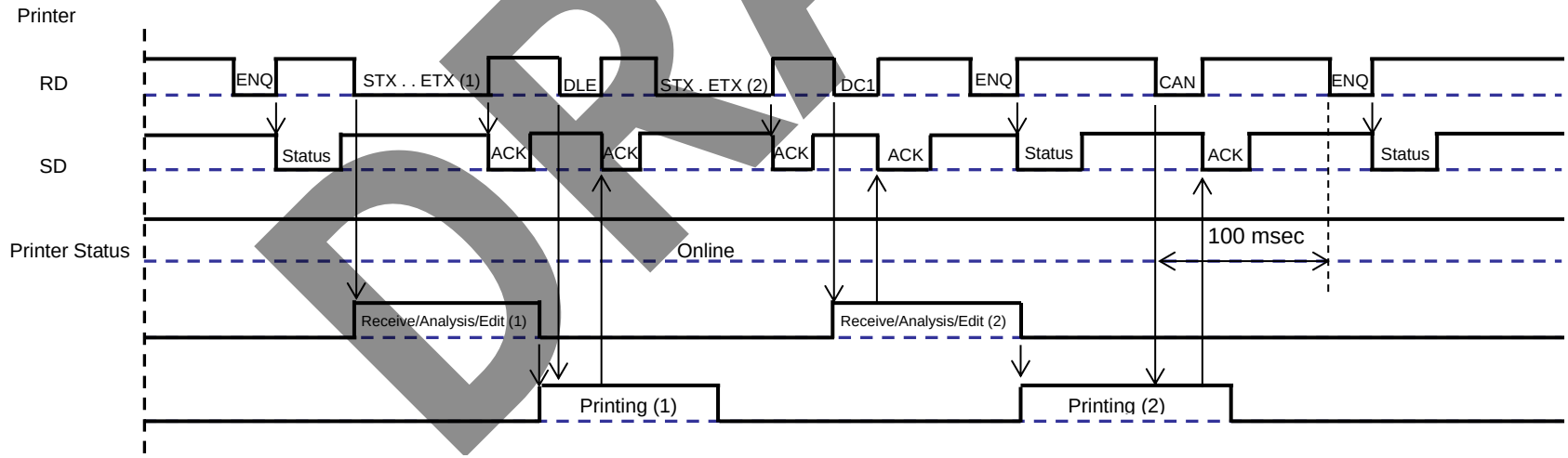
DRAFT

3) Error process



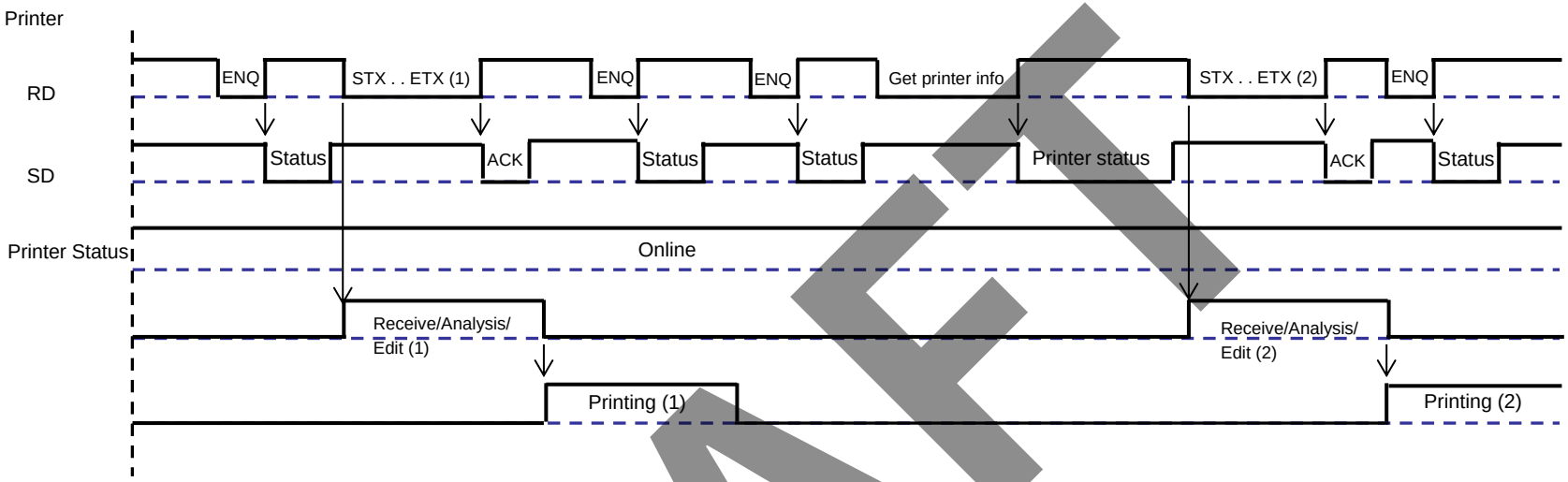
* When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

4) Print pause, print resume process



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5) Information request command process



Note: Do not send status request commands during printing.

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3.6 Printer Status 3 Return

This communication protocol is designed for the purpose of controlling print status in the host, and the printer returns the status by receiving request command from the host.
The printer returns the status after receiving the status request command.
This printer’s receive mode in this protocol is the multiple-receive.

3.6.1 Connecting diagram

1) DB-9P

Printer			Host	
RD	2	———————	3	SD
SD	3	———————	2	RD
SG	5	———————	5	SG

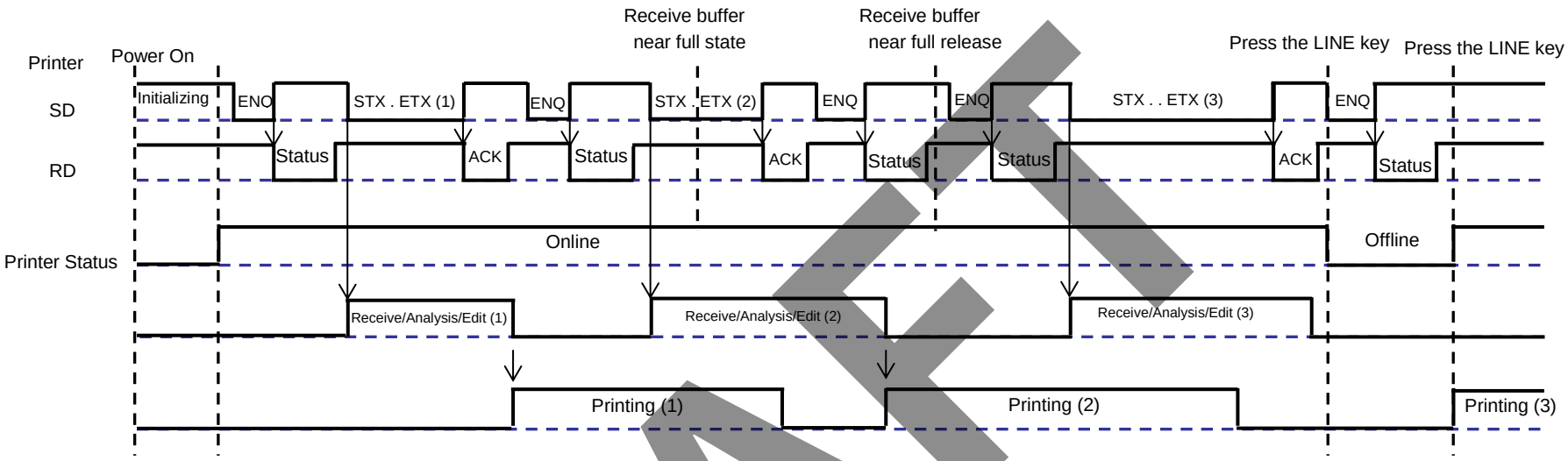
3.6.2 Explanation of input/output signal

Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	—	Signal ground

DRAFT

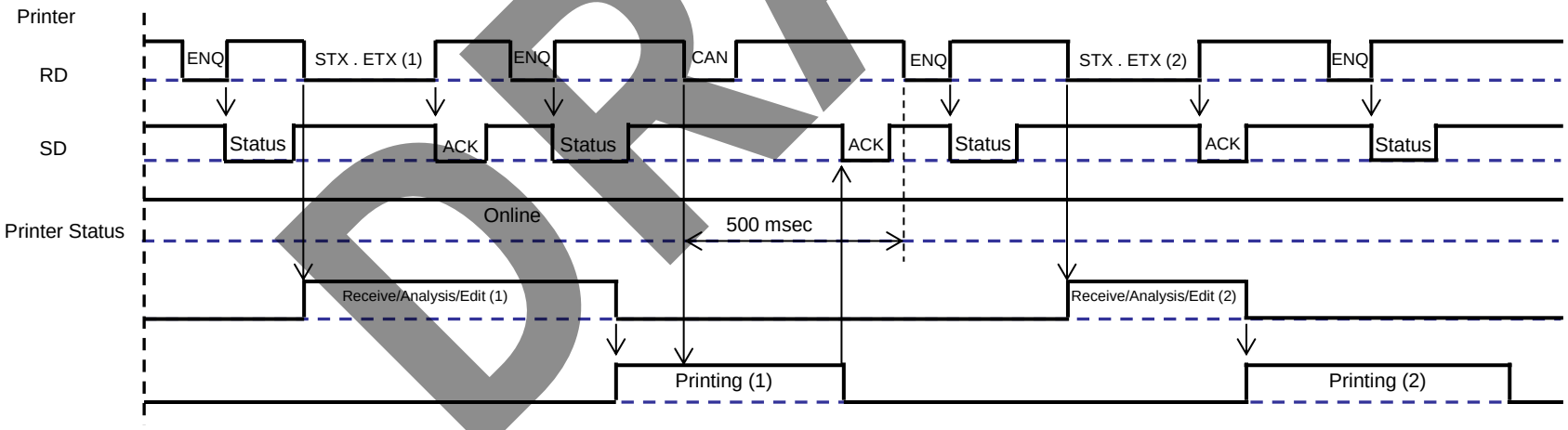
3.6.3 Timing Chart

1) Normal process



Note: Avoid sending ENQ while sending the print data (STX <A> - <Z> ETX).
This may cause return status error or print error. or there may be print error.

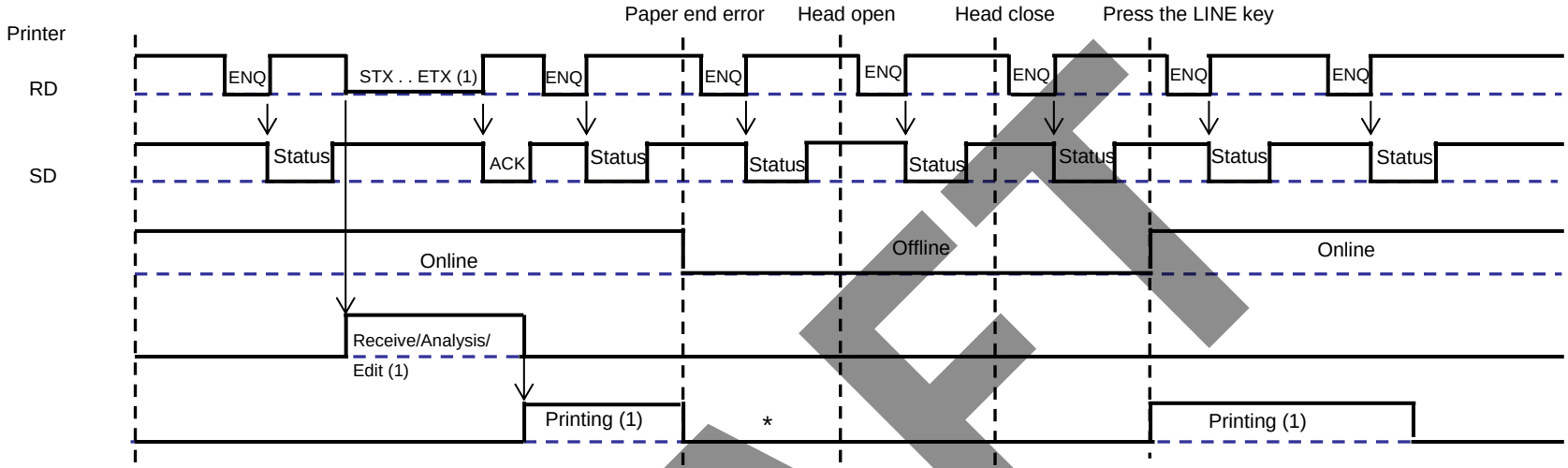
2) Cancel process



Note: When the cancel request command has sent, wait more than 500 msec before sending the next data.
Avoid sending CAN while sending the print data (STX <A> - <Z> ETX). With the above condition, the job may be canceled or the item may not be printed correctly.

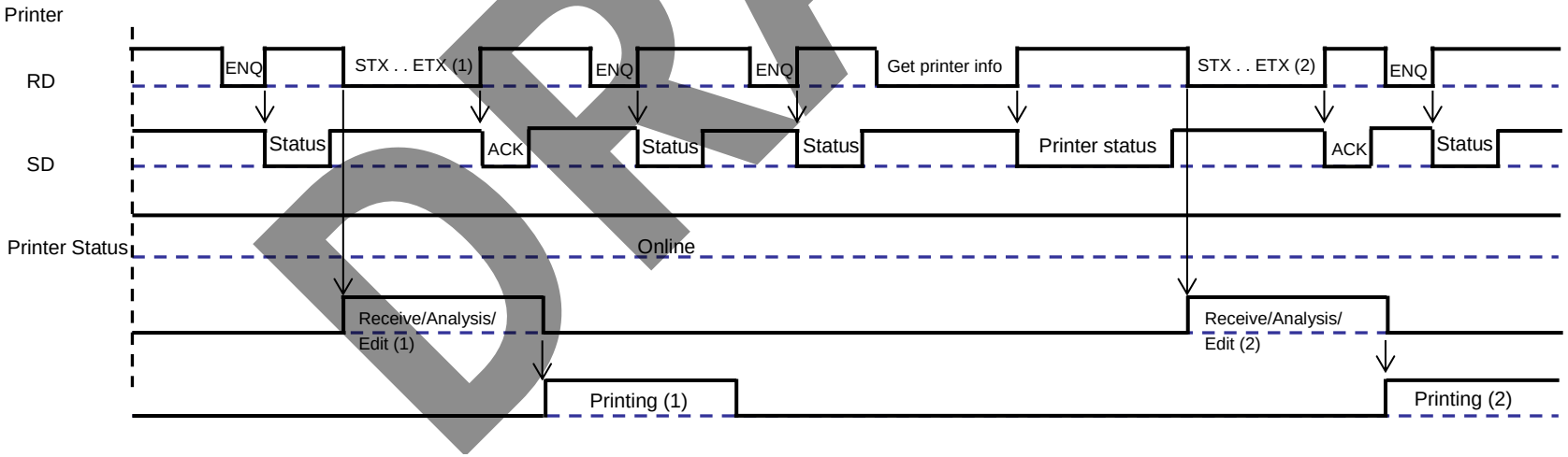
DRAFT

3) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

4) Information request command process



Note: Do not send status request commands during printing.

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3.7 Status 2

This communication protocol is for compatibility with the old model. The receive mode is single item receive.

3.7.1 Connecting diagram

1) DB-9P

Printer			Host	
RD	2	———————	3	SD
SD	3	———————	2	RD
SG	5	———————	5	SG

*Depending on the model of the host, CS and RS may need to be looped (always keep "High") at the host. Please confirm the user's guide of the host system.

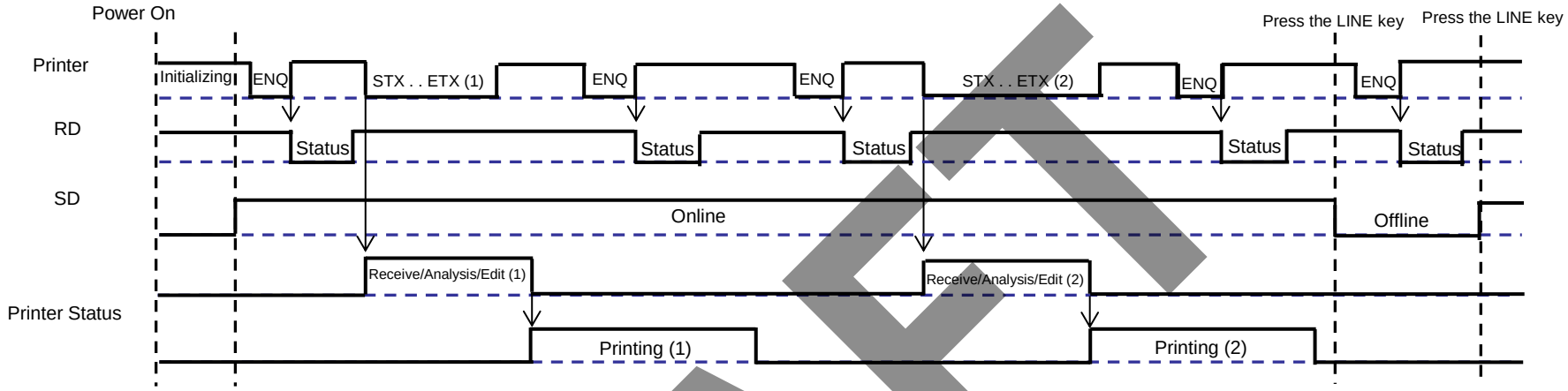
3.7.2 Explanation of input/output signal

Pin number	Signal name	Direction	Description
2	RD	Input	Data from the host to the printer
3	SD	Output	Data from the printer to the host
5	SG	-	Signal ground

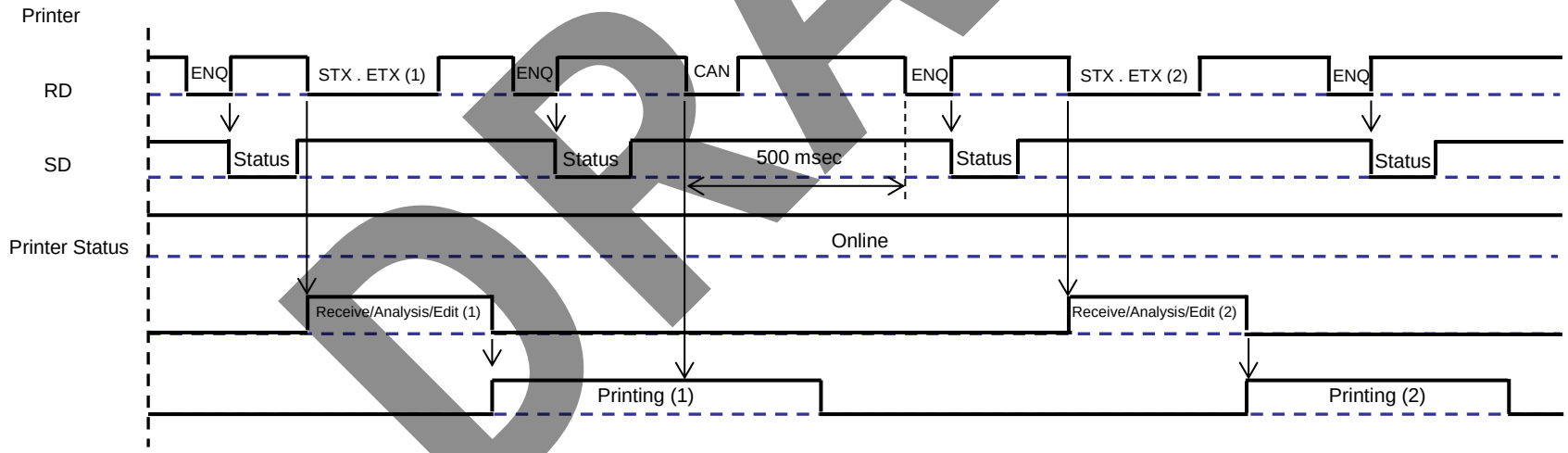
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3.7.3 Timing Chart

1) Normal process



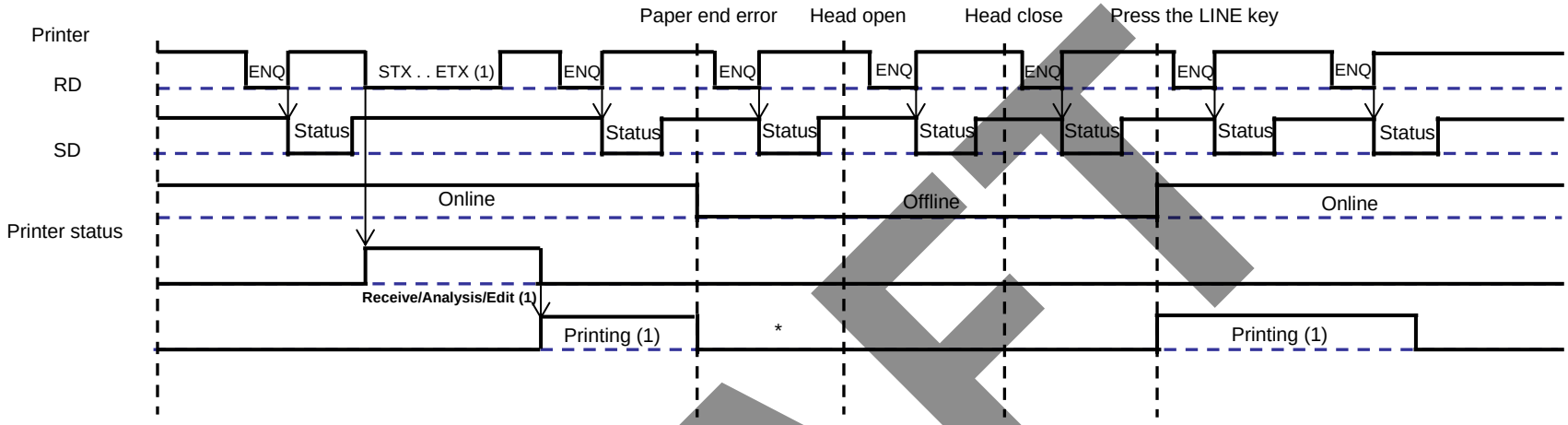
2) Cancel process



Note: When the cancel request command has sent, wait more than 500 ms before sending the next data.
Avoid sending CAN while sending the print data (STX <A> - <Z> ETX). With the above condition, the job may not be canceled or the item may not be printed correctly.

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3) Error process



* When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

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3.7.4 Return Status

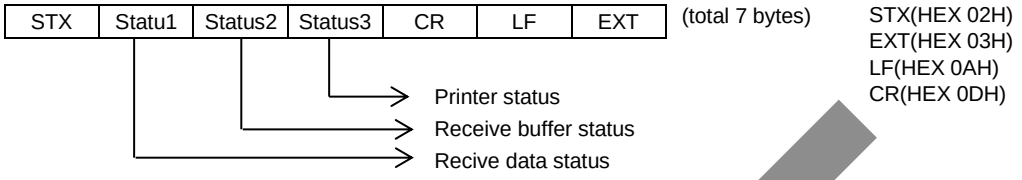
The printer returns the printer status by receiving the status request command sent from the host.
The printer initializes the receive buffer and cancels the print job by receiving the cancel request command.
The details of each request command and return status are as follows.

1) Status request command

The printer returns the state of the receive data, the receive buffer and the printer by receiving this command sent from the host.

(1) Command ENQ (HEX 05H)

(2) Return status/format



(3) Status list

State f receive data

Status return	Description
"0" (HEX 30H)	Indicates the receive text was received normally.
"1" (HEX 31H)	Indicates the receive text was received normally. (Communication error, receive buffer overflow)

State of receive buffer

Status return	Description
"0" (HEX 30H)	Indicates no data exist in the receive buffer.
"9" (HEX 39H)	Indicates data exist in the receive buffer.

Printer status

Status return	Description
"0" (HEX 30H)	Normal (Receivable state)
"1" (HEX 31H)	Online or print pause
"@" (HEX 40H)	Ribbon end
"A" (HEX 41H)	Paper end
"B" (HEX 42H)	(Unused) Cutter sensor error
"E" (HEX 45H)	Head Open
"G" (HEX 47H)	Head error
"J" (HEX 4AH)	Card error

* There is no ribbon end with the direct thermal model.

2)Cancel request command

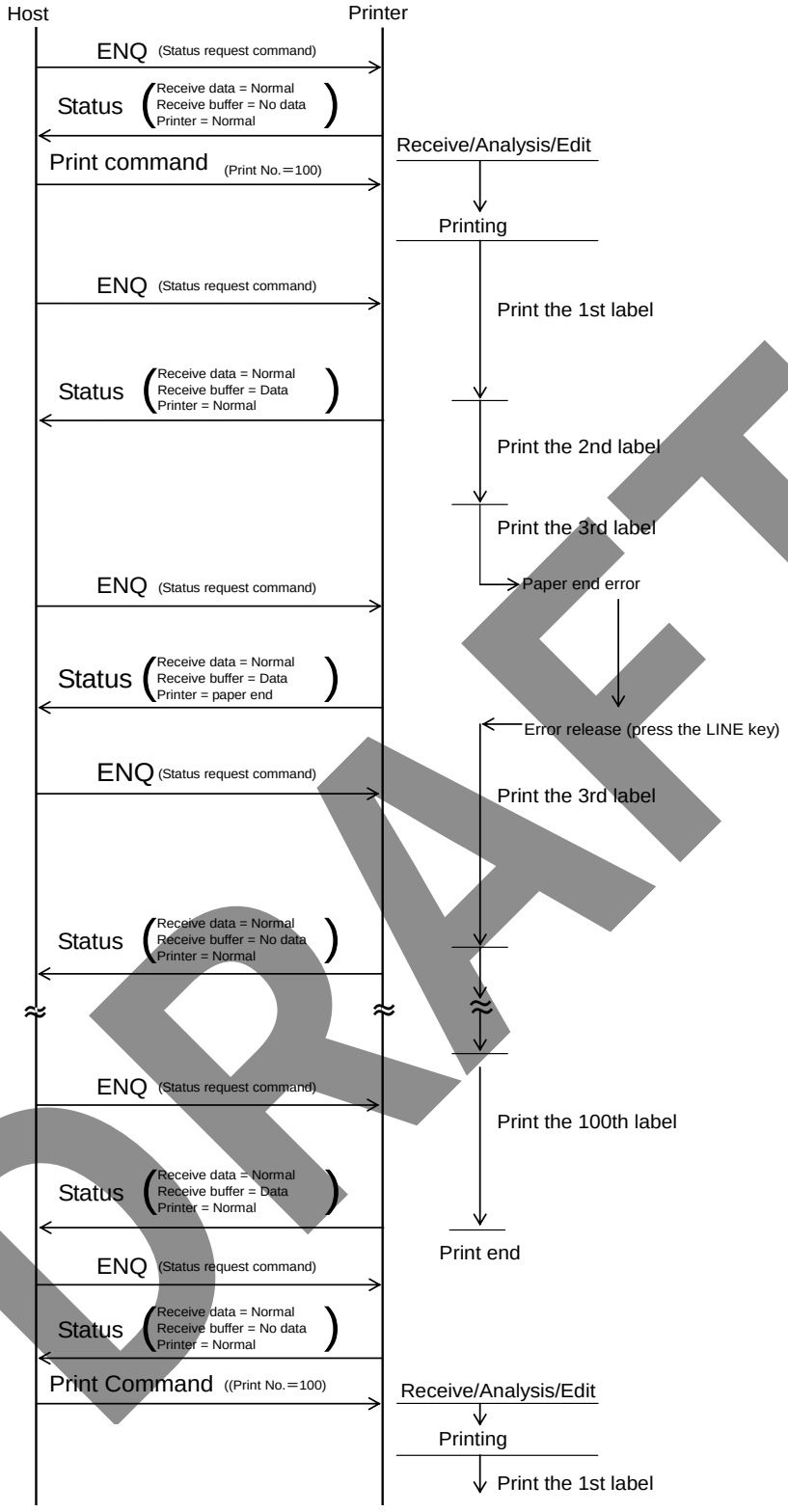
This command enables to cancel print jobs and to clear the entire contents of the receive buffer.
Note that the printer doesn't return the status with this command. Make sure to send the next data after the elapse of 500 ms as delay time after sending the cancel request.
This command is also effective in offline state and the time of the error.

(1) Command CAN (HEX 18H)

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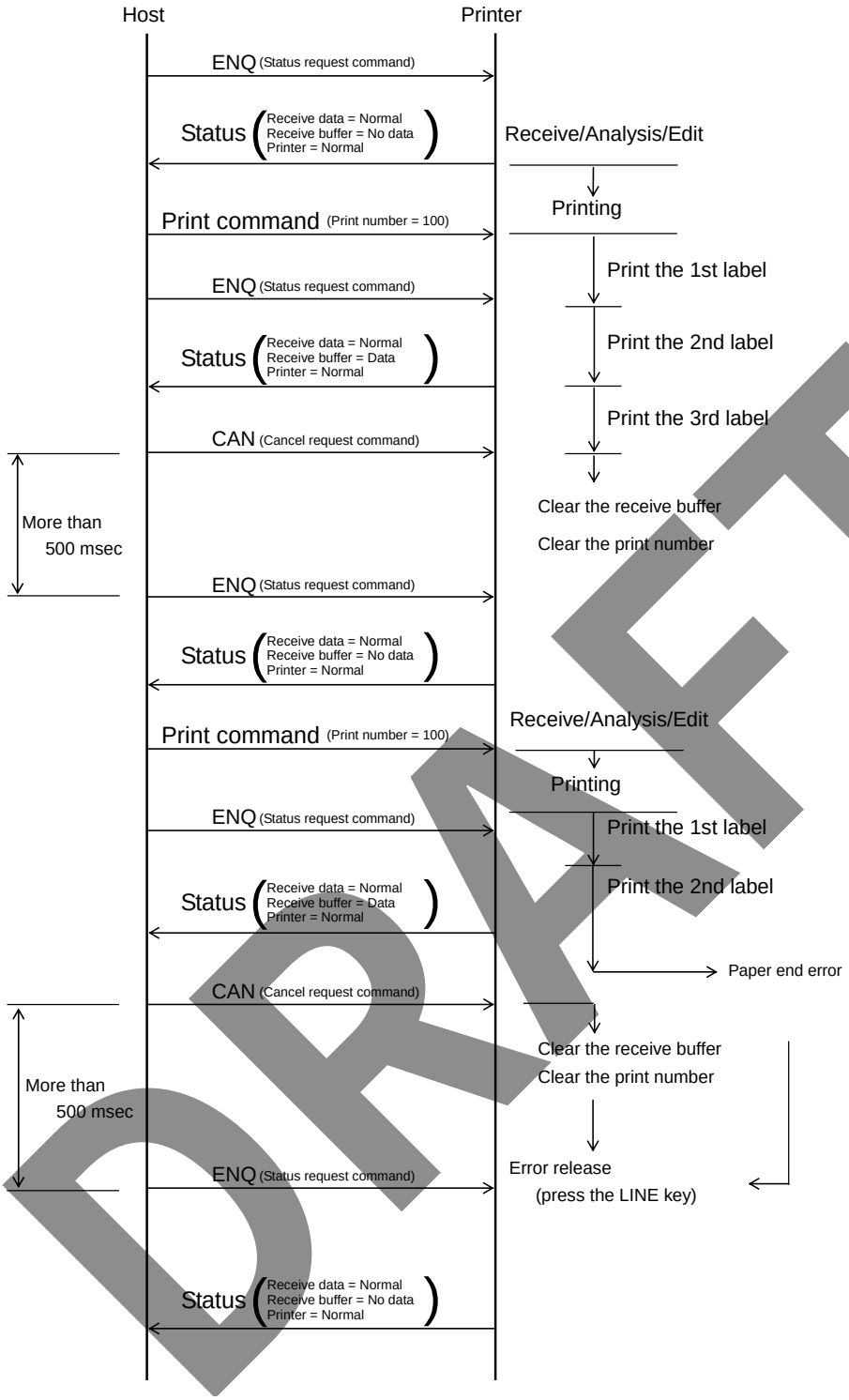
3.7.5 Return Sequence

1) Normal



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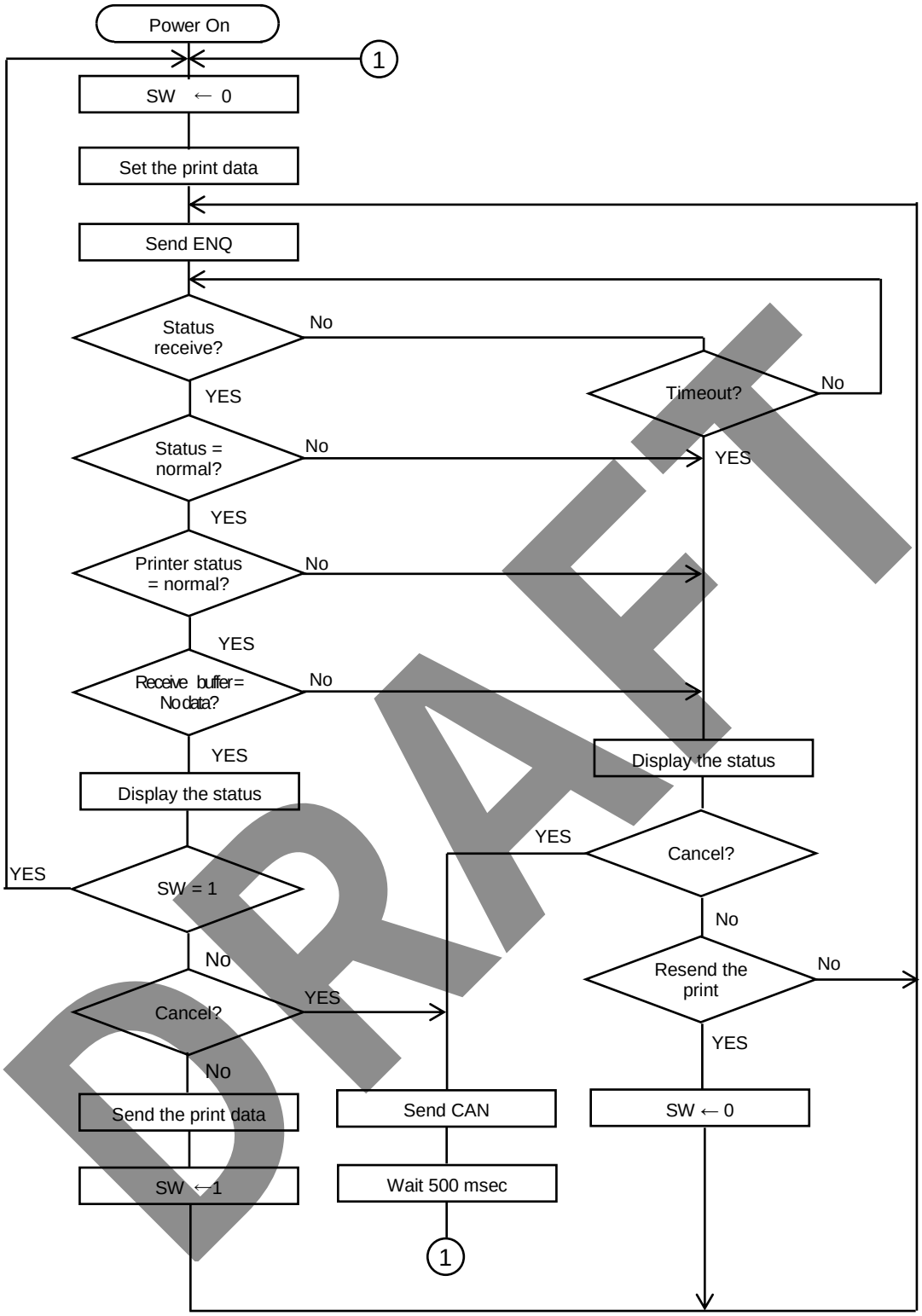
2) Cancel request command



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3.7.6 Reference Flowchart

See the flowchart below for programming on the host side.



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3.7.7 Note

*Please note the followings when using READY/BUSY.
When sending print data from the host, make sure the printer power is on before sending.

*When sending data that receive buffer size is more than 2.95 MB by using XON/XOFF, status 2, status 3, status 4, and status 5, there will be receive buffer full error. When sending data, send data that is less than 2.9 MB and send more data by watching the printer status.

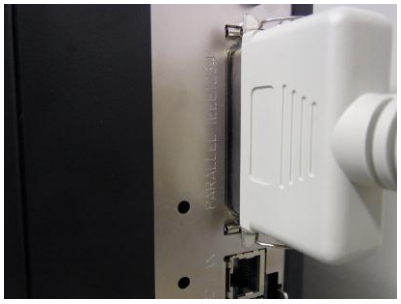
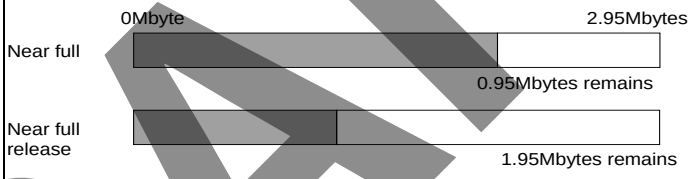
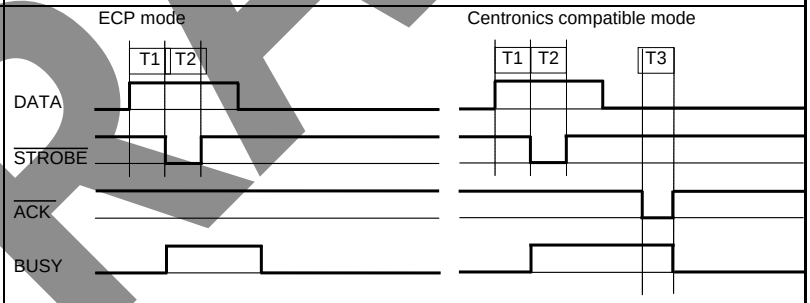
*Parity error will be detected when the parity error occurs after receiving ESC+A.

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4 IEEE1284

4.1 Basic Specifications

This interface complies with the Centronics/IEEE1284 standard. .
Single item receive or multiple receive can be switched on the interface mode of the printer.

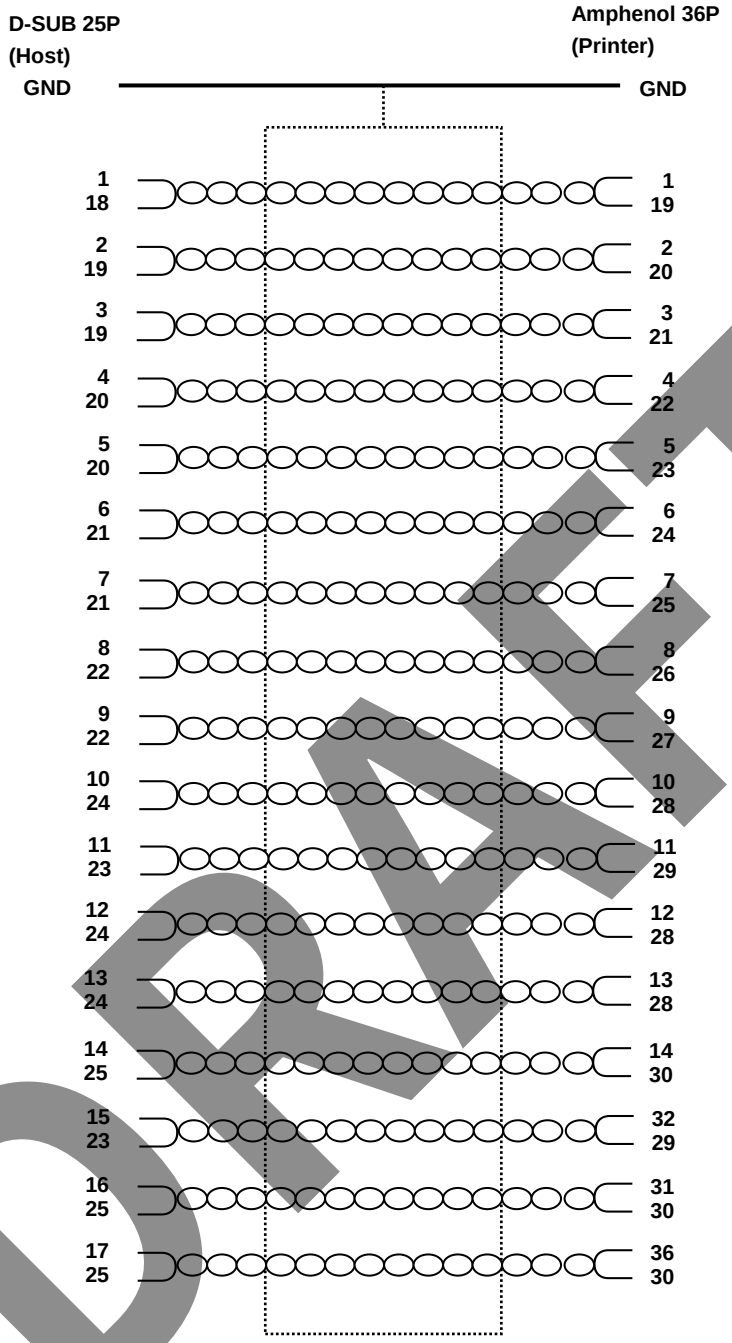
Interface	
Protocol	Status 4, Status 5 Refer to 2 Communication protocol for details.
Connector	At printer: Amphenol 36 pins (female) At cable: Amphenol 36 pins (male)
Cable length	Less than 1.5 (m)
Signal level	High level: +2.4 - +5.0 V Low level: +0.0 - +0.4V
Receive mode	Single item receive Multiple receive Set the receive mode on the communication receive mode at the printer.
Receive buffer size	2.95 MB 
Timing Chart	 Supplemental explanation1 : 0.75µs ≦ T1 0.75µs≦T2≦500µs 0.5µs ＜ T3 ＜ 1.2µs Supplemental explanation2: in case of single item receive, it is possible to set the ACK range (0.5 - 12.0µs) in the interface mode.

*Make sure to send print data while the printer power is on.
*Be sure to turn the printer's power off when removing the interface cable.

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4.2 Connecting diagram

The connecting diagram of parallel cable is as follows.
Please use a cable that has complied with the IEEE1284 standard.



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4.3 Connector Pin Assignment

The pin assignment is as follows with the Centronics standard (compatible mode).
However, the wiring diagram of the IEEE1284 standard is complied with the standard of IEEE1284 Type B connector.

Pin number	Signal name	Description	Pin number	Signal name	Description
1	STROBE	Input	19	STROBE-RETURN	
2	DATA 1	Input	20	DATA 1-RETURN	
3	DATA 2	Input	21	DATA 2-RETURN	
4	DATA 3	Input	22	DATA 3-RETURN	
5	DATA 4	Input	23	DATA 4-RETURN	
6	DATA 5	Input	24	DATA 5-RETURN	
7	DATA 6	Input	25	DATA 6-RETURN	
8	DATA 7	Input	26	DATA 7-RETURN	
9	DATA 8	Input	27	DATA 8-RETURN	
10	ACK	Output	28	ACK -RETURN	
11	BUSY	Output	29	BUSY -RETURN	
12	PE	Output	30	PE -RETURN	
13	SELECT	Output	31	INIT	Input
14	AUTOFD	Input	32	FAULT	Output
15			33		
16	LOGIC GND		34		
17	CHASSIS GND		35		
18	PERIPHERAL LOGIC HIGH	Input	36	SELECTIN	Input

4.4 Explanation of input signal

The signal lines are as follows with the Centronics standard (compatible mode).
However, the signal lines of the IEEE1284 standard are complied with the IEEE1284 standard.

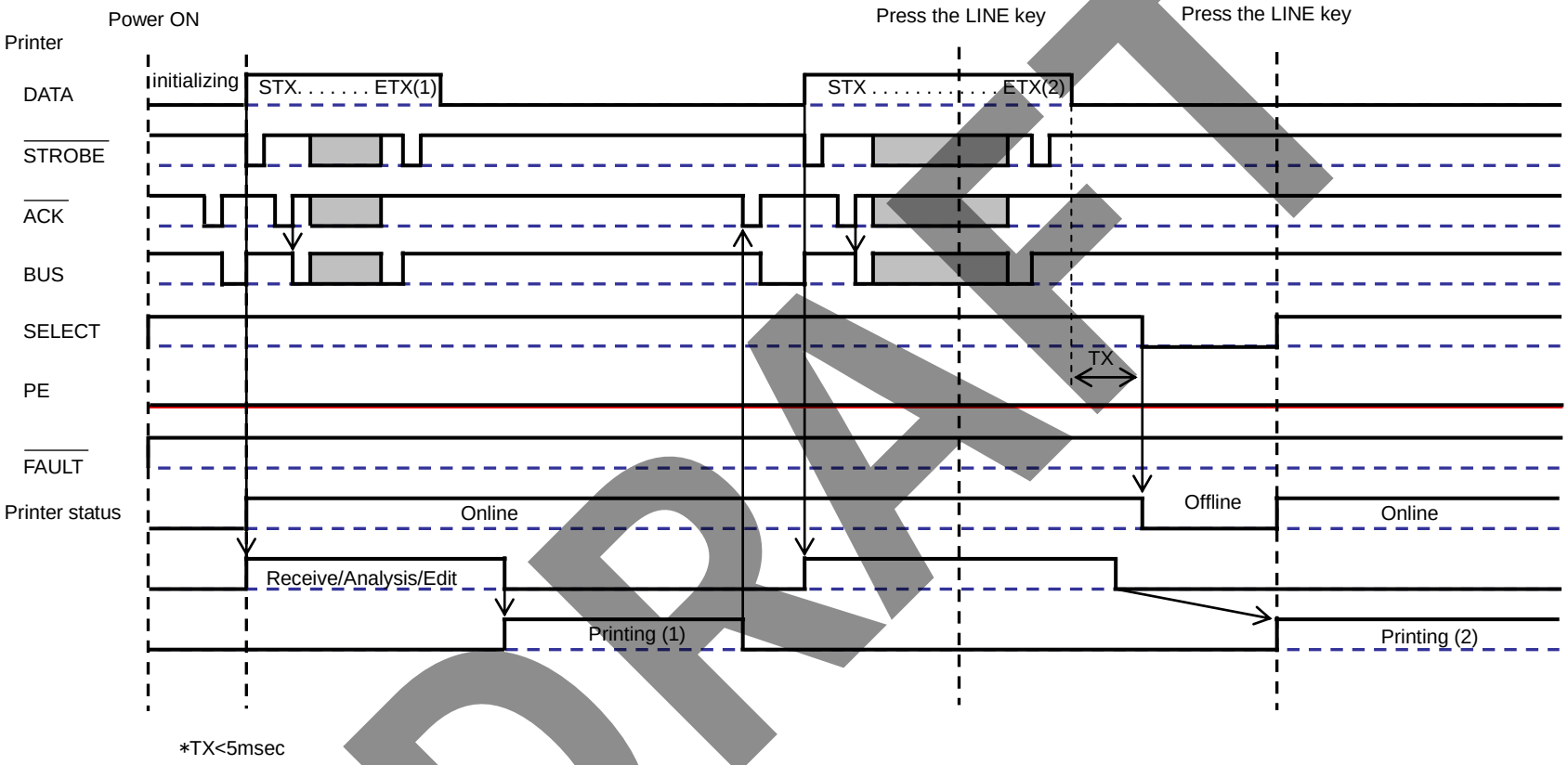
Pin number	Signal name	Direction	Description
1	STROBE	Input	A synchronized signal to read DATA 1 to DATA 8, Low active pulse is needed.
2 - 9	DATA 1 - DATA 8	Input	In the data input of 8 bits parallel, DATA 1 is LSB (lease significant bit) and DATA 8 is MSB (most significant bit).
10	ACK	Output	A low active pulse signal indicating receive data intake.
11	BUSY	Output	A high active signal indicating the printer is impossible to receive any data.
12	PE	Output	A high active signal indicating there is no label.
13	SELECT	Output	A high active signal indicating the printer is possible to receive data.
14	AUTOFD	Input	A signal for IEEE1284 standard.
17	CHASSIS GND		Connected to the chassis ground.
18	PERIPHERAL LOGIC HIGH	Output	+5 V voltage at the printer.
19 - 30	SIGNAL GROUND		Connected to each signal grounds.
31	INIT	Input	A low active pulse signal requesting the printer initialization.
32	FAULT	Output	A low active pulse signal indicating an error in the printer.
36	SELECETIN	Input	A signal for IEEE1284 standard.

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4.5 Basic Specifications

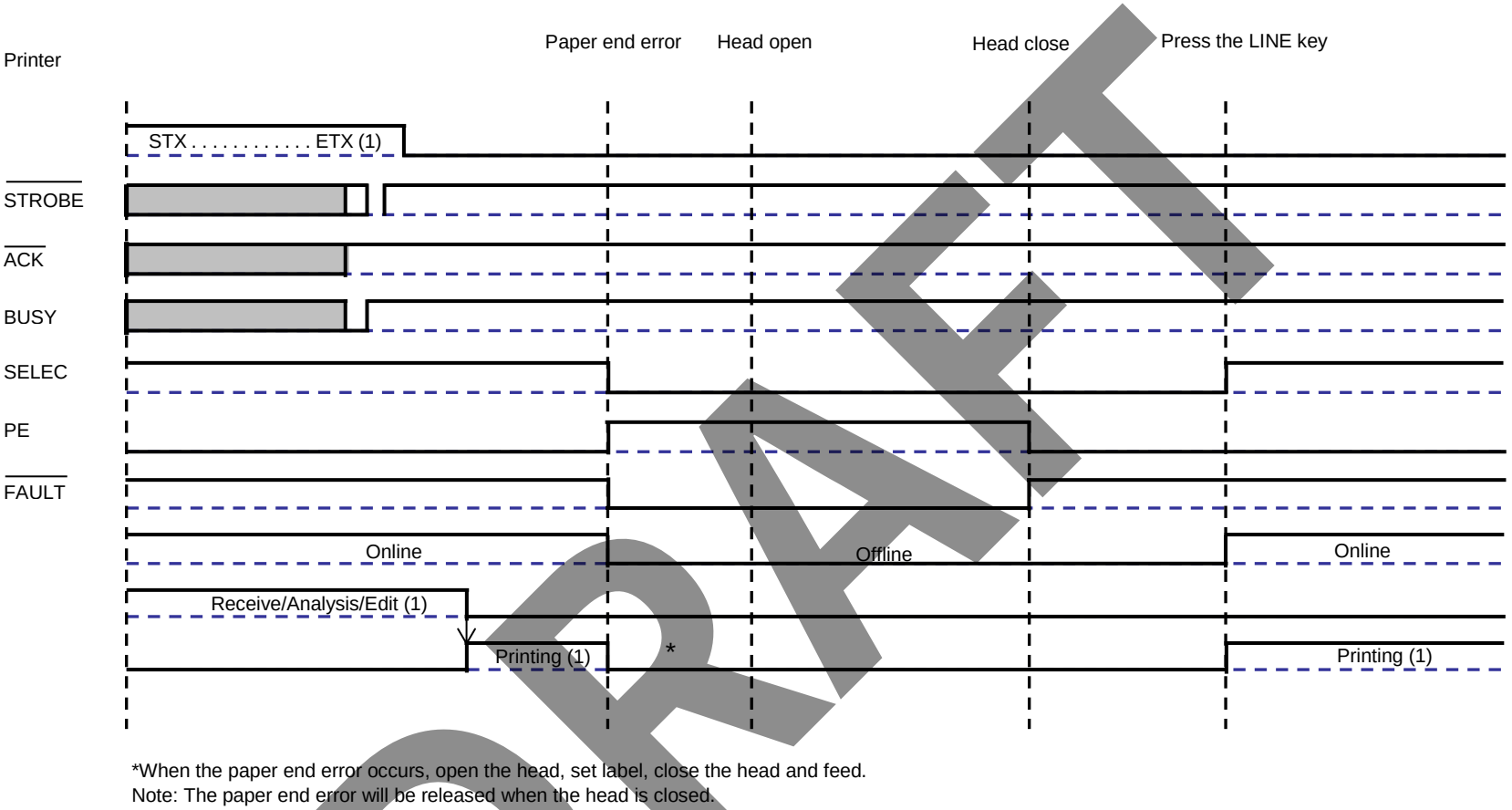
4.5.1 Timing chart of single item receive

1) Normal process



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2) Process at the paper end

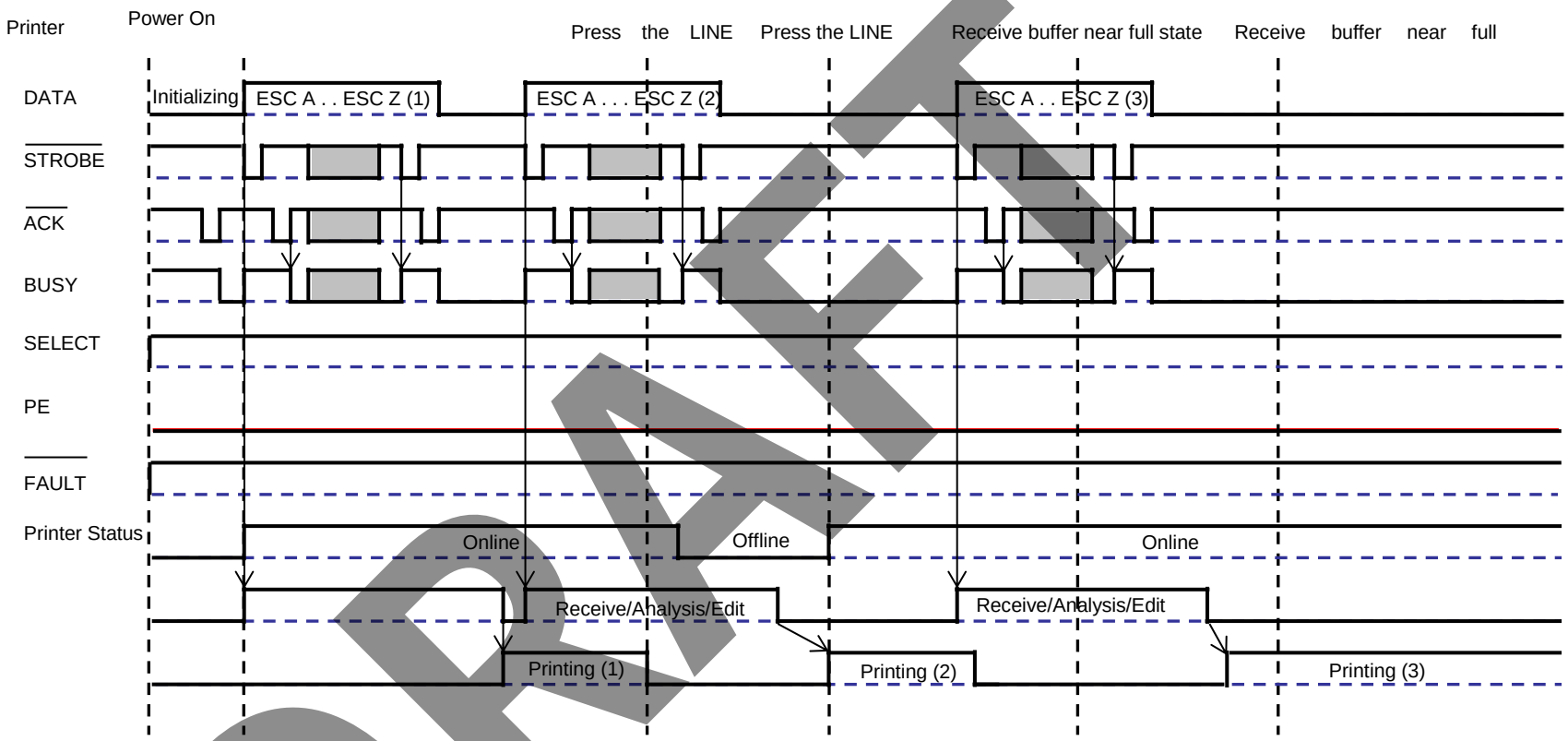


*When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

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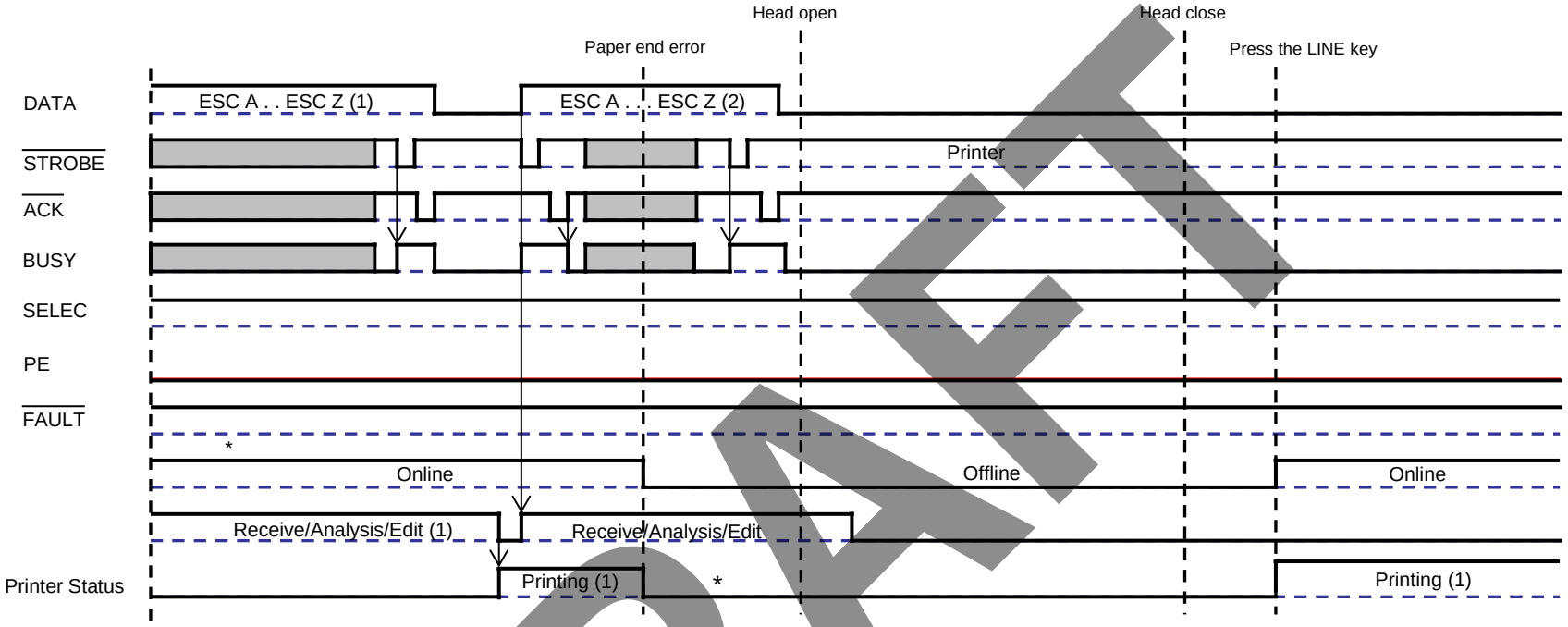
4.5.2 Timing chart of multiple receive

1) Normal process



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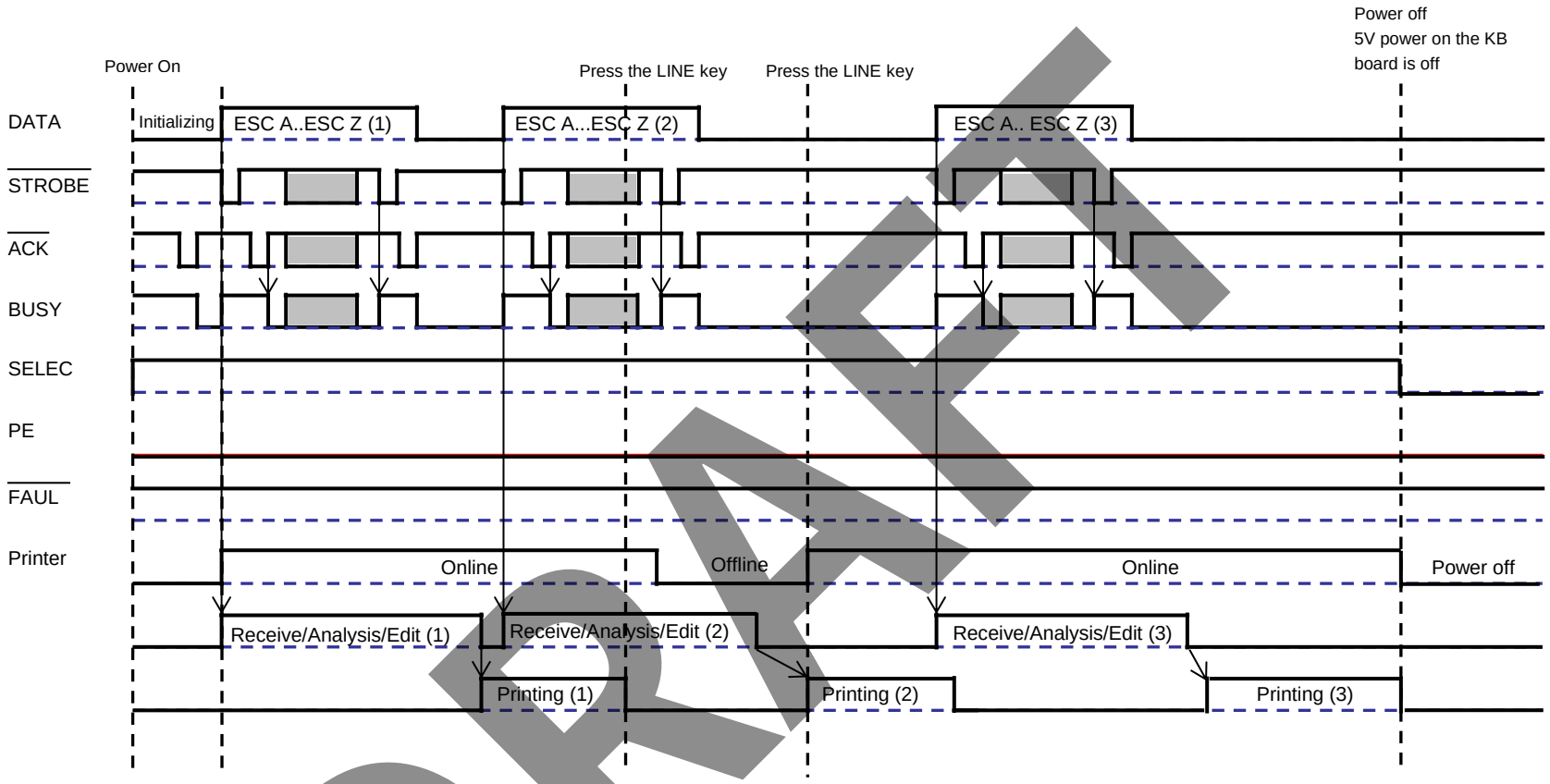
2) Process at the paper end



*When the paper end error occurs, open the head, set label, close the head and feed.
Note: The paper end error will be released when the head is closed.

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3) Process at the power off



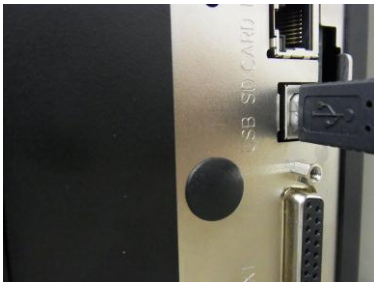
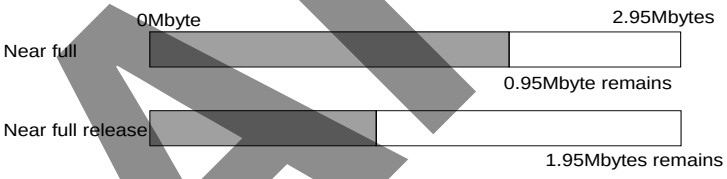
* Regardless of the state of signal line just before the power off, all signal line will be ground (0V) when 5V supplied by KB board is shut.

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5 USB

5.1 Basic Specifications

USB interface of the printer complies with USB2.0 standard.

Interface	
Protocol	Status 4, Status 5 Refer to 2 **Communication Protocol** for details.
Connector	Type B plug Cable length shorter than 5 m (Twisted pair shielded)
Version	USB 2.0 High speed
Receive buffer size	2.95 MB 

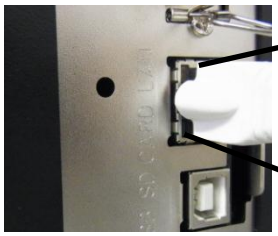
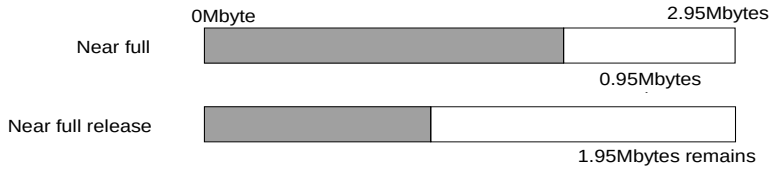
5.2 Connector Pin Assignment

Pin number	Name
1	VBus
2	-Data(D-)
3	+Data(D+)
4	GND

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6 LAN, wireless LAN

6.1 Basic Specifications (LAN)

<table>
<tr><td>Interface</td><td>
</td></tr>
<tr><td>Protocol</td><td>Status 3, Status 4, Status 5
Refer to 2 Communication Protocol for details.</td></tr>
<tr><td>Connector</td><td>Connector type RJ45
Cable type 10BASE-T, 100BASE-TX (category 5 or upper)
Cable length shorter than 100 (m)</td></tr>
<tr><td>Link/Status LED</td><td>LED lights when LINK with the Ethernet is established or the printer received packet.
<table>
<tr><th>LED</th><th>Color</th><th>Motion Specification</th></tr>
<tr><td>LED1</td><td>Green</td><td>LED lights for a certain time when received packets (10 msec)</td></tr>
<tr><td rowspan="3">LED2</td><td rowspan="3">Yellow</td><td>LED goes off when the printer detected the connection to 10BASE-T</td></tr>
<tr><td>LED lights when the printer detected the connection to 100BASE-TX</td></tr>
<tr><td>LED lights when a cable is not connected</td></tr>
</table></td></tr>
<tr><td>Communication setting</td><td>The following communication setting can be done on the communication setting mode of the printer.
<table>
<tr><th>Setting Items</th><th>Setting range</th></tr>
<tr><td>Protocol</td><td>Status 3 return
Status 4 return (cycle response mode)
Status 4 return (ENQ response mode)
Printer Status 5 Return</td></tr>
<tr><td>IP Address</td><td>0.0.0.0 - 255.255.255.255
Default Value: 192.168.1.1</td></tr>
<tr><td>Subnet Mask</td><td>0.0.0.0 - 255.255.255.255
Default Value: 255.255.255.0</td></tr>
<tr><td>Gateway Address</td><td>0.0.0.0 - 255.255.255.255
Default Value: 0.0.0.0</td></tr>
<tr><td>IP Address Settings</td><td>DISABLE (manual setting)
ENABLE
Default value: DISABLE (manual setting)</td></tr>
</table></td></tr>
<tr><td>Receive buffer size</td><td>2.95 MB

</td></tr>
</table>

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6.2 Basic Specifications (wireless LAN)

<table>
<tr><td>Interface
(Wireless LAN adapter)</td><td>
</td></tr>
<tr><td>Protocol</td><td>Status 3, Status 4, Status 5
Refer to 2 Communication Protocol for details.</td></tr>
<tr><td>LED</td><td>
<table>
<tr><th>LED</th><th>Color</th><th>Motion Specification</th></tr>
<tr><td>LEVEL</td><td>Green</td><td>Field intensity
LED lights: strong (more than Signal Level 3)
LED blinks: medium (more than Signal Level 2, less than Signal Level 3)
LED off: weak (less than Signal Level 2)
*LED lights always when at the Ad Hoc mode.</td></tr>
<tr><td>LINK</td><td>Green</td><td>Link:
LED blinks: not connected to an access point
LED lights: connected to an access point</td></tr>
<tr><td>STATUS</td><td>Orange</td><td>Status
LED blinks: for a certain time when received packets</td></tr>
<tr><td>MODE</td><td>Green</td><td>Wireless LAN Mode
LED blinks: Ad Hoc mode
LED lights: Infrastructure mode</td></tr>
</table>
*It's impossible to confirm the LED because this will be installed inside the printer.
*The field intensity will be displayed on the printer LCD. Refer to the ”Operator Manual” for more details.</td></tr>
<tr><td>Setting of communication conditions</td><td>The following communication setting can be done in the communication setting mode of the printer.
<table>
<tr><th>Setting Items</th><th>Setting range</th></tr>
<tr><td>Protocol</td><td>Status 3 Return
Status 4 (cycle response mode)
Status 4 (ENQ response mode)
Printer Status 5 Return</td></tr>
<tr><td>IP Address</td><td>0.0.0.0 - 255.255.255.255
Default Value: 192.168.1.1</td></tr>
<tr><td>Subnet Mask</td><td>0.0.0.0 - 255.255.255.255
Default Value: 255.255.255.0</td></tr>
<tr><td>Gateway Address</td><td>0.0.0.0 - 255.255.255.255
Default Value: 192.168.1.2</td></tr>
<tr><td>IP Address Settings</td><td>DISABLE (manual setting) (default value)
ENABLE</td></tr>
<tr><td>Communication mode</td><td>Ad Hoc mode
Infrastructure mode</td></tr>
<tr><td>SSID</td><td>SSID
Default: SATO_PRINTER</td></tr>
<tr><td>Channel</td><td>1 - 13
Default Value: 6</td></tr>
</table></td></tr>
</table>

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<table>
<tr>
<td>Wireless LAN specification</td>
<td>
(1) Standard
IEEE802.1b/g/n
(2) Frequency band
2.4GHz
(3) Baud rate
Max. 11Mbps (Connected by IEEE802.11b)
Max. 54Mbps (Connected by IEEE802.11g)
Max. MCS7(*1) (Connected by IEEE802.11n)
*1) The maximum speed varies depending on the conditions Please refer the below.
<table>
<tr><th>Band width</th><th>Guard interval</th><th>Baud rate</th></tr>
<tr><td rowspan="2">20MHz</td><td>800 nsec</td><td>65.0Mbps</td></tr>
<tr><td>400 nsec</td><td>72.2Mbps</td></tr>
<tr><td rowspan="2">40MHz</td><td>800 nsec</td><td>135.0Mbps</td></tr>
<tr><td>400 nsec</td><td>150.0Mbps</td></tr>
</table>
(4) Wireless LAN communication mode
Infrastructure mode
Ad Hoc mode
*In IEEE802.11n, only Infrastructure mode is available.
(5) Channel
1 - 13 (when connected with IEEE802.11b/g/n)
*AP channel will be used in the Infrastructure mode.
*A channel of the other side will be used when the other side's status is waiting for connection in the Ad Hoc mode.
*Setting range will be different depending on the regional setting.
<table>
<tr><th>Region</th><th>Setting range</th></tr>
<tr><td>USA/Canada</td><td>1 - 11</td></tr>
<tr><td>Europe/Malaysia/Singapore/Korea/China</td><td>1 - 13</td></tr>
</table>
*Regardless of the regional setting, when the band width of the IEEE802.11n is 40MHz, the setting range will be 3 to 11 channel.
(6) SSID
Up to 32 alphanumeric characters and symbols (from 20H to 7EH) can be set.
(7) Authentication
Open System
Shared Key
WPA/WPA2
IEEE802.1x (EAP-TLS, LEAP, EAP-TTLS, EAP-PEAP(v0), EAP-FAST are selectable. Hereafter written as "EAP".) .
(8) Encryption scheme
None
WEP
(Open System, Shared key and 802.1x authentication are selectable)
TKIP
(must be selected from WPA-PSK/WPA2-PSK and WPA-802.1x/WPA2-802.1x authentication)
AES
(must be selected from WPA-PSK/WPA2-PSK and WPA-802.1x/WPA2-802.1x authentication)
</td>
</tr>
</table>

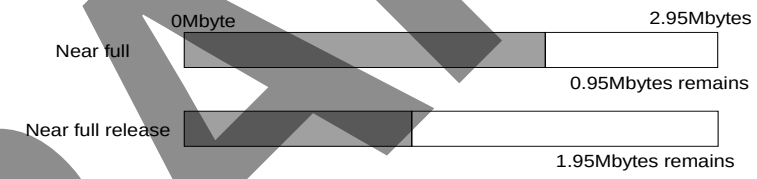
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[Security Type]

Security	Structure	
	Encryption scheme	Authentication
WEP	WEP	-
WEP-EAP	WEP	EAP-MD5
Dynamic WEP	WEP	EAP-TLS
		EAP-PEAP
		EAP-TTLS
		LEAP
		EAP-FAST
WPA-PSK	TKIP	PSK
WPA-EAP	TKIP	EAP-TLS
		EAP-PEAP
		AP-TTLS
		LEAP
		EAP-FAST
WPA2-PSK	AES	PSK
WAP2-EAP	TKIP	EAP-TLS
		EAP-PEAP
		EAP-TTLS
		LEAP
		EAP-FAST
	AES	EAP-TLS
		EAP-PEAP
		EAP-TTLS
		LEAP
		EAP-FAST

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<table>
<tr>
<td></td>
<td>(9) Security (combination of authentication and encryption scheme)
Ad Hoc mode
<table>
<tr><th>Authentication</th><th>Encryption scheme</th></tr>
<tr><td rowspan="2">Open System</td><td>None</td></tr>
<tr><td>WEP</td></tr>
<tr><td rowspan="2">Shared Key</td><td>None</td></tr>
<tr><td>WEP</td></tr>
</table>
*Ad Hoc mode is not supported with IEEE802.11n.
*Selection at the Shared Key will be disabled and operates with Open System.

Infrastructure mode
<table>
<tr><th>Authentication</th><th>Encryption scheme</th></tr>
<tr><td rowspan="2">Shared Key</td><td>None</td></tr>
<tr><td>WEP</td></tr>
<tr><td rowspan="2">Open System</td><td>None</td></tr>
<tr><td>WEP</td></tr>
<tr><td rowspan="2">Open System + EAP</td><td>None</td></tr>
<tr><td>WEP</td></tr>
<tr><td>WPA/WPA2 + PSK</td><td>TKIP/AES</td></tr>
<tr><td>WPA/WPA2 + EAP</td><td>TKIP/AES</td></tr>
</table>
*Note
When using this printer around medical equipments/facilities, please consult with the system administrator to confirm there is no influence to the equipments/facilities.</td>
</tr>
<tr>
<td>Receive buffer size</td>
<td>2.95 MB

</td>
</tr>
</table>

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6.3 Software Specifications

Available protocol: TCP/IP

Network layer: ARP, IP and ICMP

Session layer: TCP and UDP

Application layer: LPD, FTP, TELNET, BOOTP, DHCP, HTTP, SNMP, SNTP

1) LPR, FTP and dedicated socket protocol of TCP/IP are available for sending print data.
2) Dedicated socket protocol is available to obtain printer status.
3) SNTP, SNMP, TELNET are not supported with the wireless LAN.

6.4 TCP/IP

TCP/IP protocol environment has LPD and FTP for printing, and TELNET for setting each variables. You can use BOOTP/DHCP for setting each address.

6.5 LPD

Protocol of LPD complies with RFC1179, and handles the list of logical printer name as a cue name. The cue name has 3 names: lp, sjis, euc

Cue name	Kanji filter	Kanji code	Supporting interface [○ : supported, × : not supported]	
			LAN	Wireless LAN
lp	None	N/A	○	○
sjis	None	N/A	○	-
euc	None	N/A	○	-

Order of sending of data file and control file doesn’t affect print operation when sending job with LPR.

* Deleting job with LPR is not available.
* LPD specification is only available in Status 4/ENQ response.
* When conducting large quantity printing with LPR, some data may be skipped because of the specification of Windows.
* Banner page printing is not available.
* Note that establishing multiple session at the same time is not available.

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6.6 FTP

FTP protocol complies with RFC959. It handles the list of logical printer name as a transmission destination directory, and performs transmitting files to the directory as the print operation. You can specify ASCII (A) or BINARY (I) or TENEX (L8) as a transmission mode, however difference of the mode depends on the client.
Directory has 3 names: lp, sjis, euc.

Cue name	Kanji filter	Kanji code	Supporting interface [○ : supported, × : not supported]	
			LAN	Wireless LAN
lp	None	N/A	○	○
sjis	None	N/A	○	-
euc	None	N/A	○	-

* Note that establishing multiple session at the same time is not available.

6.7 TELNET

TELNET complies with RFC854. Changing and referring internal settings and displaying status is available by using an interactive menu. You need to log in as a “root” user and enter password to change the settings.
The root password is not set as the default (line feed) .
In addition, Wireless LAN is not supported.

<TELNET command example>
Enter [TELNET xxx.xxx.xxx.xxx (IP address)] from the MS-DOS command prompt, and enter user name and password, then following message will appear.

```
SATO PRINTER S84-ex Series TELNET server.
Copyright(C) 2010 SATO Corporation
login:  root
root' user needs password to login
password:
User 'root' logged in

                No.  Item                    Value                (level.1)
 ------------------------------------------------------------
                1: Setup TCP/IP
                2: Display status
               99: EXIT setup
Please select(1-99)?
```

Please refer to "6.7.1 **Setting/Display items** " for the setting of [1: Setup TCP/IP].

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6.7.1 Setting/Display items

Sections that can be set and referred, and variables are listed in the table below.

TCP/IP related setting

Variable name	Setting range	Default (at shipment)
IP address	0.0.0.0 - 255.255.255.255 *2	192.168.1.1
Subnet mask	0.0.0.0 - 255.255.255.255	255.255.255.0 (calculated from the IP address)
Gateway address	0.0.0.0 - 255.255.255.255	0.0.0.0
DHCP protocol	ENABLE/DISABLE	DISABLE
Keepalive time	30 - 300	180 (sec)
Keepalive retry	1 - 99	17 (times)
Socket cancel	Normal/Compatible	Normal
ROOT password	Any alphanumeric [16]*1	NULL (no password)

*1 Numbers in [ ] are upper limit.
*2 The fixed IP will be displayed when DHCP is selected.

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6.8 SNTP (Simple Network Time Protocol)

SNTP corrects time of the calendar IC when it is mounted.
In addition, Wireless LAN is not supported.

6.8.1 Function

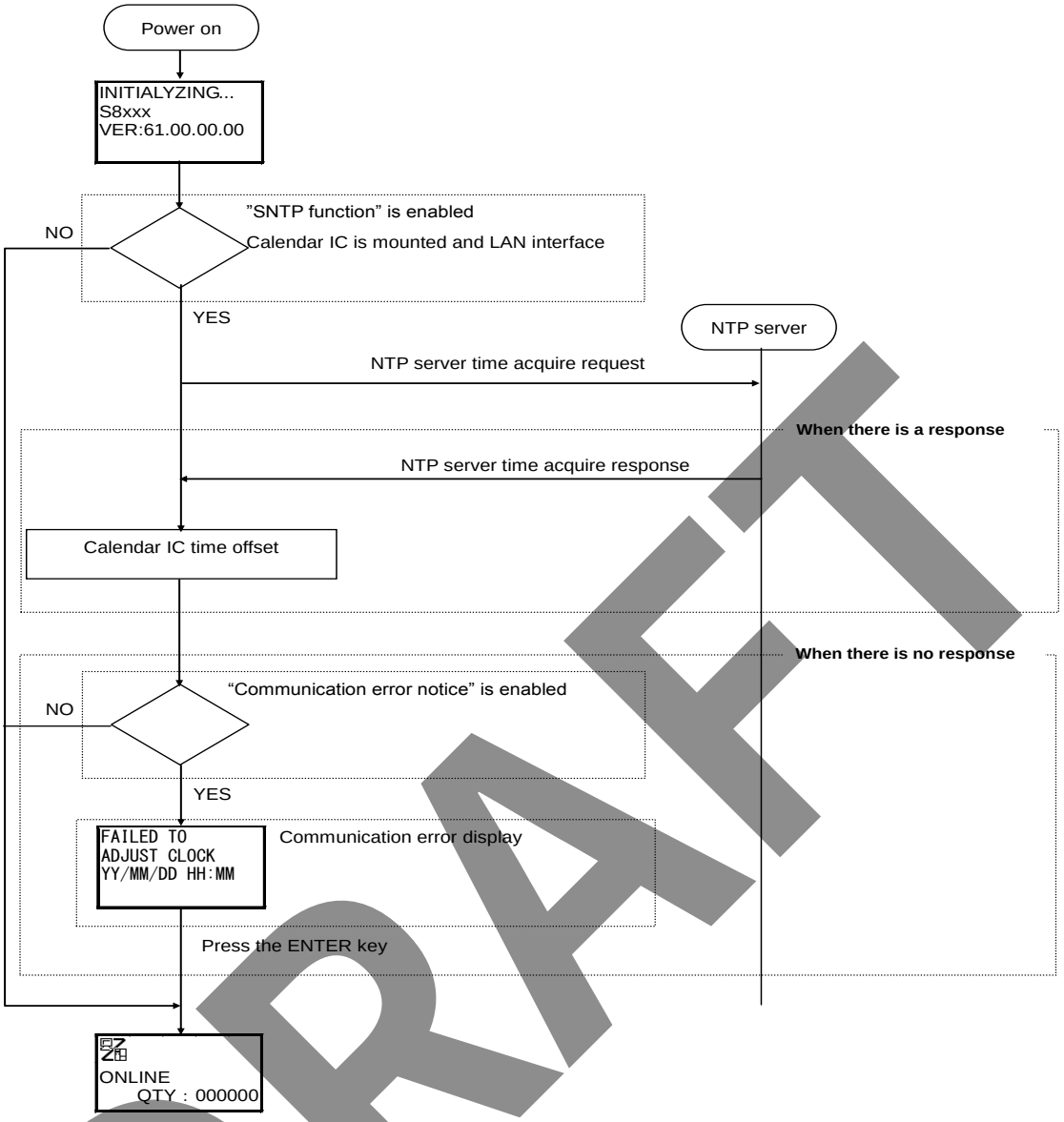
This function acquires the current time from the NTP server and corrects time of the calendar IC at the printer power on when a calendar IC is mounted on the printer and LAN is selected as [data port] at the [communication setting]. ENABLE/DISABLE the SNTP and IP address setting of the NTP server can be done on the communication setting mode. This function is available only when a calendar IC is mounted to the printer.

6.8.2 Operating conditions

The operating conditions of the SNTP function are as follows.
(1) A calendar IC is mounted to the printer.
(2) Communication setting is LAN.
 * Select LAN at the [communication setting] - [data port].
 (Refer to the communication settings of "Operational Manual" for more setting details.)
(3) Available only in the Normal mode.

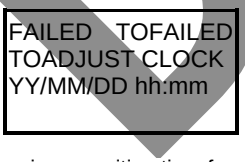
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6.8.3 Operation Sequence



[Supplemental explanation]

1. Time correction is only when printer is turned on. Time correction will fail when NTP server doesn't respond (timeout period is 4 sec).
2. The following display will be shown and there will be buzzer sound when time correction has failed and "Setting of communication error notice" is "ENABLE".



3. The maximum waiting time from starting time acquisition from NTP server to displaying time correction failure screen is approx. 37 sec. The condition to become the maximum waiting time is enabling DHCP setting of IP address setting of the printer and all become time-out. Time-out period for each setting is as follows.
   -Time-out period of DHCP is approx. 33 seconds.
   -Time-out period of NTP is approx. 4 seconds.

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6.9 HTTP (Hyper Text Transfer Protocol)

HTTP sets setting items of LAN, wireless LAN.

6.9.1 LAN settings

(1)Settable items in the LCD.
(2)Display the printer status.
(3)Display the external signal status.

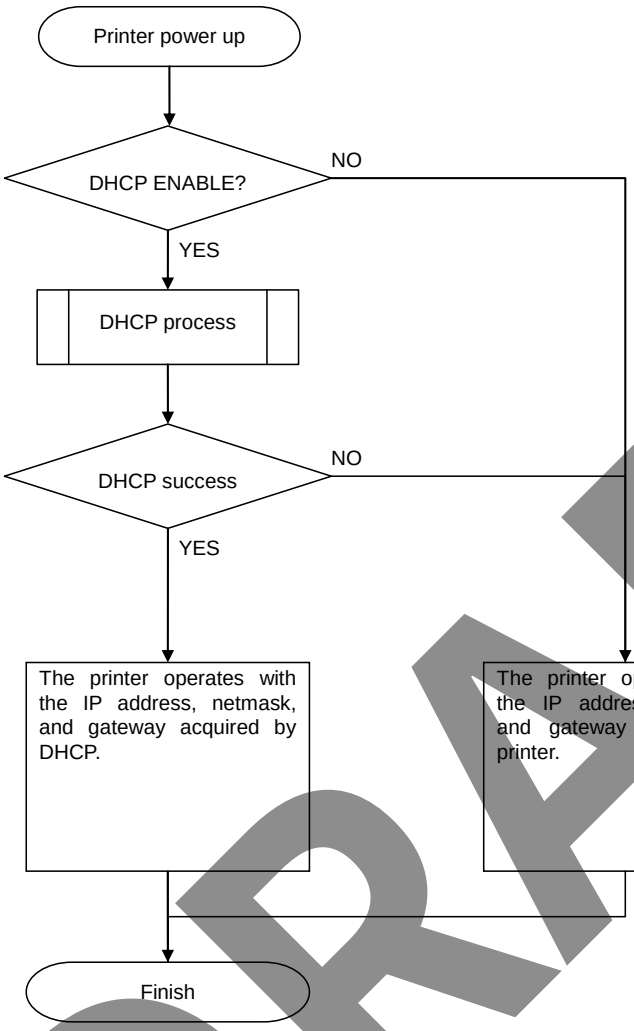
6.9.2 Wireless LAN settings

Refer to "**6.11.1 Setting item list** ".

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6.10 Setting of IP Address

There are several ways to set the IP address such as obtaining from DHCP server, interface setting on the LCD screen, SBPL command or network setting tool.
The printer acquires an IP address as shown in following flow below according to the acquisition method set in the printer at power on.
* Obtaining IP address via "ARP-s" and ping is not available.



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6.11 Wireless LAN settings

6.11.1 Setting item list

Classification	Setting Items	Default Values	Setting range	Setting		
				WEB	Printer	Command
TCP/IP Setting	IP Address	192.168.1.1	0.0.0.0 - 255.255.255.255	○	○	○
	Subnet Mask	255.255.255.0	0.0.0.0 - 255.255.255.255	○	○	○
	Gateway	192.168.1.2	0.0.0.0 - 255.255.255.255	○	○	○
	DHCP/BOOTP	DISABLE	ENABLE DISABLE	○	○	○
	DNS primary address	0.0.0.0	0.0.0.0 - 255.255.255.255	○	-	-
	DNS secondary address	0.0.0.0	0.0.0.0 - 255.255.255.255	○	-	-
	Timeout time for DNS Query packet	3	1 - 10	○	-	-
	Retry of DHCP Discover	10	1 - 10	○	-	-
Wireless LAN Setting	Wireless LAN mode	Infra.	Ad Hoc Infra.	○	○	○
	SSID (*3)	"SATO_PRINTER"	1 - 32 characters	○	○	○
	Communication channel (*2)	6	1 - 13	○	○	○
	Network authentication	Open System	Open System Shared Key WPA WPA2	○	-	○
	Regional code	US	Defined value of the module US Canada Europe Malaysia Singapore Korea China	-	○	○

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Classification	Setting Items	Default Values	Setting range	Setting		
				WEB	Printer	Command
WEP key Setting	Use of WEP	DISABLE	ENABLE DISABLE	○	-	○
	Available key	1	1 - 4	○	-	○
	Key 1 (*1)	" " (NULL character)	64 bits: 10 digits in HEX or 5 characters 128 bits: 26 digits in HEX or 13 characters	○	-	○
	Key 2 (*1)	" " (NULL character)		○	-	○
	Key 3 (*1)	" " (NULL character)		○	-	○
	Key 4 (*1)	" " (NULL character)		○	-	○
802.1x authentication Setting	802.1x authentication	DISABLE	ENABLE DISABLE	○	-	○
	Authentication mode	EAP-TLS	LEAP EAP-TLS EAP-TTLS EAP-PEAP EAP-FAST	○	-	○
802.1x authentication Setting	User name (*3)	" " (NULL character)	1 - 63 characters	○	-	○
	Password (*3)	" " (NULL character)	0 - 32 characters	○	-	○
802.1X-TTLS Setting	Internal authentication method	PAP	PAP CHAP MSCHAP MSCHAPv2	○	-	○
	Verification of the server certificate	OFF	ON/OFF	○	-	○
802.1X-PEAP Setting	Internal authentication method	MSCHAPv2	MSCHAPv2	○	-	○
	Verification of the server certificate	OFF	ON/OFF	○	-	○
802.1X-FAST Setting	Auto distribution of PAC file	OFF	ON/OFF	○	-	○
WPA/WPA2	WPA mode	PSK	PSK 802.1x	○	-	○
	Data encryption scheme	TKIP	TKIP AES	○	-	○
WPA-PSK Setting	Pre-Shared Key(*3)	"sato printer"	8 - 63 characters	○	-	○
WPA-802.1X Setting	Authentication mode	EAP-TLS	LEAP EAP-TLS EAP-TTLS EAP-PEAP EAP-FAST	○	-	○
	User name (*3)	" " (NULL character)	1 - 63 characters	○	-	○
	Password (*3)	" " (NULL character)	0 - 32 characters	○	-	○

*1 Setting can be done with HEX or ASCII input. In ASCII input, the upper case and the lower case can be distinguished, however, these are not distinguished with HEX code input.

*2 The setting range of the channel varies depending on the regional setting.

*3 Alphanumeric characters and symbols (Usable character range is from 20H to 7EH)

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6.11.2 Combinations of wireless settings and necessary items

There are settable combinations in wireless LAN setting. (6.2 Basic Specifications (wireless LAN)) The list below shows necessary items in the each combination (○: necessary, ×: not necessary).

Classification	Setting Items	Ad Hoc				Infrastructure							
		Open System		Shared Key(*3)		Open System				Shared Key		WPA/WPA2	
		WEP ENABLE	WEP DISABLE	WEP ENABLE	WEP DISABLE	WEP ENABLE		WEP DISABLE		WEP ENABLE	WEP DISABLE	TKIP/AES	
						802.1x authentication ENABLE (*1)	802.1x authentication DISABLE	802.1x authentication ENABLE	802.1x authentication DISABLE			802.1x authentication	PSK Advanced shared key
TCP/IP setting	IP Address	○	○	○	○	○	○	○	○	○	○	○	○
	Subnet Mask	○	○	○	○	○	○	○	○	○	○	○	○
	Gateway	○	○	○	○	○	○	○	○	○	○	○	○
	DHCP/BOOTP	○	○	○	○	○	○	○	○	○	○	○	○
Wireless LAN Setting	Wireless LAN mode	○	○	○	○	○	○	○	○	○	○	○	○
	SSID	○	○	○	○	○	○	○	○	○	○	○	○
	Used channel	○	○	○	○	○	○	○	○	○	○	○	○
	Network authentication	○	○	○	○	○	○	○	○	○	○	○	○
	Regional code	○	○	○	○	○	○	○	○	○	○	○	○
	DNS primary address	○	○	○	○	○	○	○	○	○	○	○	○
	DNS secondary address	○	○	○	○	○	○	○	○	○	○	○	○
	Timeout time for DNS Query packet	○	○	○	○	○	○	○	○	○	○	○	○
	Retry of DHCP Discover	○	○	○	○	○	○	○	○	○	○	○	○
WEP key setting	Use of WEP setting	○	○	○	○	○	○	○	○	○	○	×	×
	WEP Key Index	○	×	○	×	○	○	×	×	○	×	×	×
	WEP key length	○	×	○	×	○	○	×	×	○	×	×	×
	WEP key 1	○	×	○	×	○	○	×	×	○	×	×	×
	WEP key 2	○	×	○	×	○	○	×	×	○	×	×	×
	WEP key 3	○	×	○	×	○	○	×	×	○	×	×	×
	WEP key 4	○	×	○	×	○	○	×	×	○	×	×	×
802.1x authentication setting	802.1x authentication	×	×	×	×	○	○	○	○	×	×	×	×
	Authentication mode	×	×	×	×	○	×	○	×	×	×	×	×
	User name	×	×	×	×	○*2	×	○*2	×	×	×	×	×
	Password	×	×	×	×	○*2	×	○*2	×	×	×	×	×
802.1x-TTLS setting	Internal authentication method	×	×	×	×	○	×	○	×	×	×	○	×
	Verification of the server certificate	×	×	×	×	○	×	○	×	×	×	○	×
802.1x-PEAP setting	Internal authentication method	×	×	×	×	○	×	○	×	×	×	○	×
	Verification of the server certificate	×	×	×	×	○	×	○	×	×	×	○	×
802.1x-FAST setting	Auto distribution of PAC file	×	×	×	×	○	×	○	×	×	×	○	×
WPA/WPA2 setting	WPA mode	×	×	×	×	×	×	×	×	×	×	○	○
	Data encryption scheme	×	×	×	×	×	×	×	×	×	×	○	○
WPA-PSK setting	Pre-Shared Key	×	×	×	×	×	×	×	×	×	×	×	○

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Classification	Setting Items	Ad Hoc				Infrastructure							
		Open System		Shared Key(*3)		Open System				Shared Key		WPA/WPA2	
		WEP ENABLE	WEP DISABLE	WEP ENABLE	WEP DISABLE	WEP ENABLE		WEP DISABLE		WEP ENABLE	WEP DISABLE	TKIP/AES	
						802.1x authentication ENABLE (*1)	802.1x authentication DISABLE	802.1x authentication ENABLE	802.1x authentication DISABLE			802.1x authentication	PSK Advanced shared key
WPA-802.1x setting	Authentication mode	×	×	×	×	×	×	×	×	×	×	○	×
	User name	×	×	×	×	×	×	×	×	×	×	○*2	×
	Password	×	×	×	×	×	×	×	×	×	×	○*2	×

*1 "WEP key index" and "WEP key" distributed by AP are used for the communication when WEP key is distributed from AP. (Dynamic WEP)
AP distributes "WEP key index" only or "WEP key index" and "WEP key". When only "WEP key index" is distributed, the appropriate "WEP key" set at wireless LAN setting of the designated "WEP key index" will be used. With above condition, it is impossible to communicate if the "WEP key" are not identical.

*2 The details regarding the user name and password are explained at "6.11.3 802.1x authentication and certification".

*3 Selection at the Shared Key will be disabled and operates with Open System with Ad Hoc mode.

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6.11.3 802.1x authentication and certification

Depending on the format, certification is necessary or not necessary in 802.1x authentication. When the certification is necessary, it needs to be imported from the WEB setting screen.
Type of certification and secret key, necessity of certification, ID, and password are explained below.

- Items need to be imported from the WEB setting screen

No.	Imported item	Description
1	Route certification	File: select files of route certification
2	Client certification	Password: input the secret password for the client certificate File: files of client certification
3	Secret key	Password: input password for the secret key File: select secret files
4	PAC file	Password: input password for the PAC files File: select PAC files

- Necessity of ID/password and each certification in the 802.1x authentication.

EAP format	Necessity (○:necessary, ×: not necessary, △: others)						
	User name	Password	Certification Password	Route certification	Client certification	Secret key	PAC file
EAP-TLS	○	×	○	○	○	○	×
EAP-PEAP	○	○	×	○	×	×	×
EAP-LEAP	○	○	×	×	×	×	×
EAP-TTLS	○	○	×	○	×	×	×
EAP-FAST	○	○	×	×	×	×	△(*1)

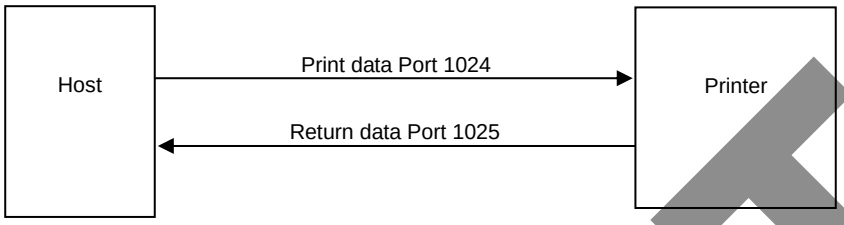
*1 Necessary when PAC file auto distribution is OFF.

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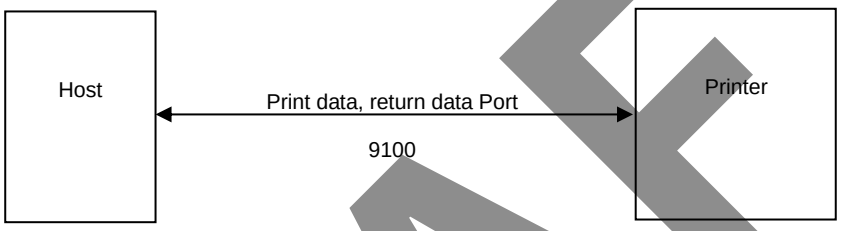
6.12 Socket Communication

2 types of connection can be used in the socket server function of TCP/IP; 2 port connection that uses Port 1024 for receiving print data and Port 1025 for printer status return, and 1 port connection that uses Port 9100 for print data receiving and printer status return.
When using Port 9100, the printer returns only status return data and the printer operation setting request data.
Using both 2 port connection and 1 port connection at the same time is not available.
Each socket cannot connect to multiple sessions at the same time.
LPR and FTP are available for sending print data in addition to socket. During connecting LPR or FTP, connecting to print data port (Port 1024 or Port 9100) with socket communication is not available.
2 ports connection with Port 1025 and Port 9100 is not available. Please use them as 1 port connection.

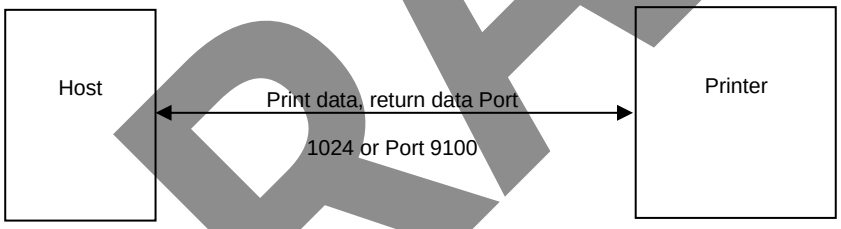
1) Printing with 2 ports connection/Socket (Status 4)



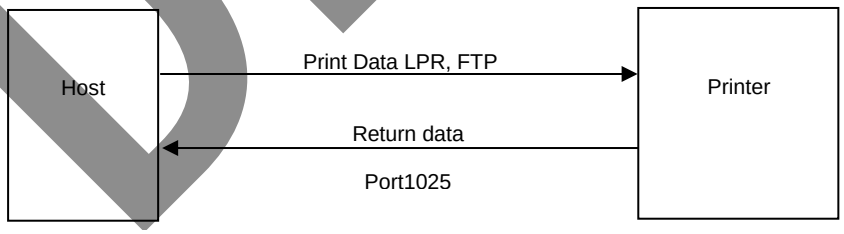
2) Printing with 1 port connection/Socket (Status 4)



3) Printing with 1 port connection/Socket (Status 3 and 5 return)



4) Printing with LPR, FTP



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6.12.1 Port Number

(1)Overlapping of the port number with the printer server function

It is possible to change the port number of the Port 1024/Port 1025/Port 9100 in the range of "00001 - 65535" from the LCD, however, the following will happen when the port number is overlapped with the port number used for printer server function (FTP/TELNET/HTTP/LPD).

No.	Server function	Port number	Note
1	FTP	20 (Data)	Port number "20" is connectable because it is not always being as waiting for connection. However, FTP connection is not available.
		21 (Control)	Can not be used as the print port
2	TELNET	23	Can not be used as the print port
3	HTTP	80	Can not be used as the print port
4	LPD	515	Can not be used as the print port

Over 1024 is recommended for the port number.

(2)Socket error occurring

The port for Socket connection will be selected from the port numbers specified at Port 1024/Port 1025/Port 9100depending on the communication protocol (see "6.12 Socket communication"). If an error occurs during the socket creation process, the socket communication cannot be used.

<Status 3 or Status 5>

No.	Port 1024	Port 1025	Port 9100	Available port
1	×	○	○	Port 9100
2	○	×	○	Port 1024, Port 9100
3	○	○	×	Port 1024
4	×	○	×	None
5	○	×	×	Port 1024
6	×	×	○	Port 9100
7	○	○	○	Port 1024, Port 9100

[○: Success, ×: Error]

* Port 1025 is not used. Even if port 1025 has an error, it doesn’t affect other valid port.

<Status 4>

No.	Port 1024	Port 1025	Port 9100	Available port
1	×	○	○	Port 9100
2	○	×	○	Port 9100
3	○	○	×	Port 1024, Port 1025
4	×	○	×	None
5	○	×	×	None
6	×	×	○	Port 9100
7	○	○	○	Port 1024, Port 1025, Port 9100

[○: Success, ×: Error]

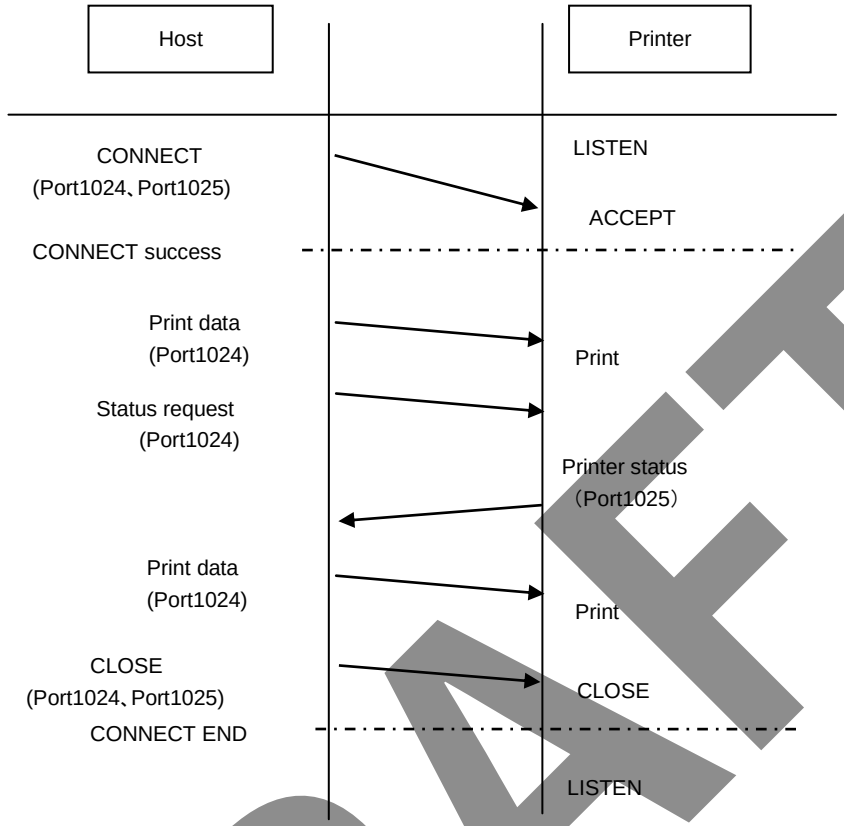
* Port 1024 and port 1025 are used in pair. If either of port has an error, you cannot use both ports.

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6.13 Connection and disconnection of session

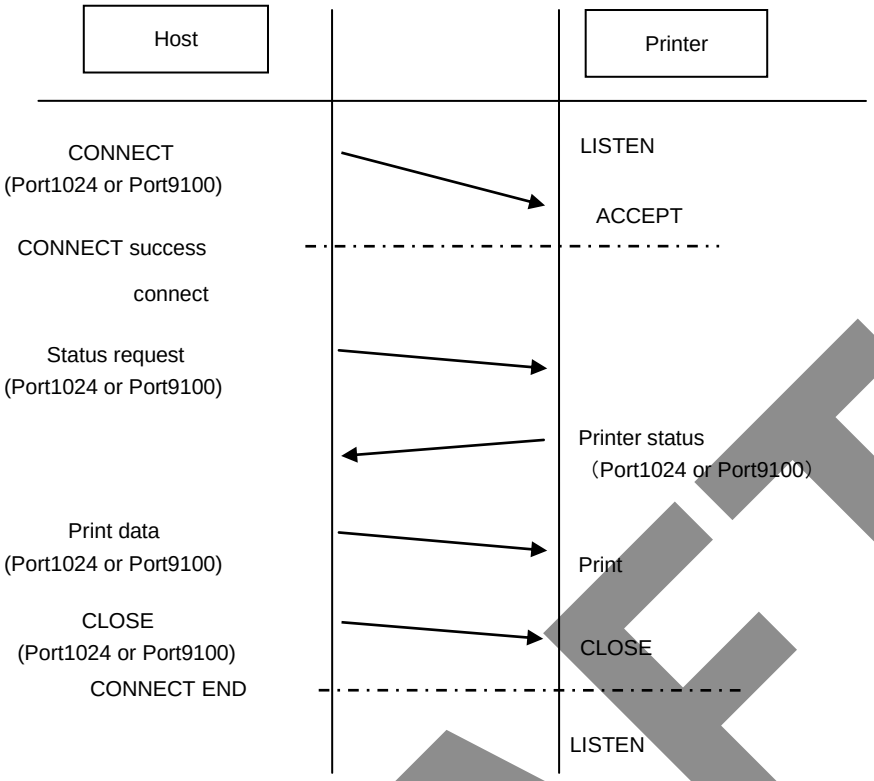
The socket server function connects and disconnects the print data port (Port 1024), the status reply port (Port 1025) and the sending and receiving port (Port 9100 or Port 1024) in the following manner.

1) print data port (Port 1024), status return port (Port 1025)



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2）send/receive port (Port9100 or Port1024)



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6.14 Printer status

1) Status mode

There are 3 modes of status return when using LAN interface.

(1) Status 4/Cyclic response mode (2 port connection or 1 port connection)

The printer uses port 1024 for print data port, port 1025 for status return, and port 9100 for both print data port and status return.

The printer output the printer status at a constant period (500 msec to 1000 msec interval). Also, the printer returns the latest printer status by receiving the status request command sent from the host.

(2) Status 4/ENQ response mode (2 port connection or 1 port connection)

The printer uses port 1024 for print data port, port 1025 for status return, and port 9100 for both print data port and status return.

The printer returns the printer status by receiving the status request command sent from the host.

(3) Status 3, Status 5/ENQ response mode (1 port connection)

The printer uses port 1024 for print data port and status return, or uses port 9100 for both print data port and status return.

The printer returns ACK by receiving the print request command sent from the host, and returns the printer status by receiving the status request command sent from the host.

Printer driver cannot be used for label printing while using Status 3. Also, the printer setting tool cannot be used.

The switching status mode is available by changing the setting of the communication protocol and the printer status reply timing in the interface mode of the printer. Type of status mode and the setting items in the interface setting mode is as follows.

Type of status mode	Setting items in the interface setting mode	
	Communication Protocol (PROTOCOL)	Printer status reply timing (REPLY TIMING)
2 port connection Cyclic response mode	Status 4 (STATUS4)	Cyclic response (CYCLE)
2 port connection ENQ response mode	Status 4 (STATUS4)	ENQ
1 port connection ENQ response mode	Status 3 (STATUS3)	-
	Status 5 (STATUS5)	

2) Status return data format

(1) 2 port connection (Status 4 return)

Number of send bytes 4 bytes 0000001CH	ENQ 1 byte 05H	STX 1 bytes 02H	ID number 2 bytes	Status 1 byte	Remaining print number 6 bytes	JOB name 16 bytes	ETX 1 byte 03H

(Total: 32 bytes)

Please refer to the "2.2.3 **Return status of Status 4**" for the status contents.

(2) 1 port connection (Status 5 return)

STX 1 byte 02H	Specified item Number. 5 bytes	Specified item Status 2 bytes	Currently processed item 5 bytes	Currently processed item Status 2 bytes	Currently processed item Number of print 6 bytes	ETX 03H 1 byte

(Total: 22 bytes)

Please refer to the "2.2.4 **Return status of Status 5**" for the status contents.

(3) 1 port connection (Status 3 return)

STX 1 byte 02H	ID number 2 bytes	Status 1 byte	Remaining print number 6 bytes	ETX 1 byte 03H

(Total: 11 bytes)

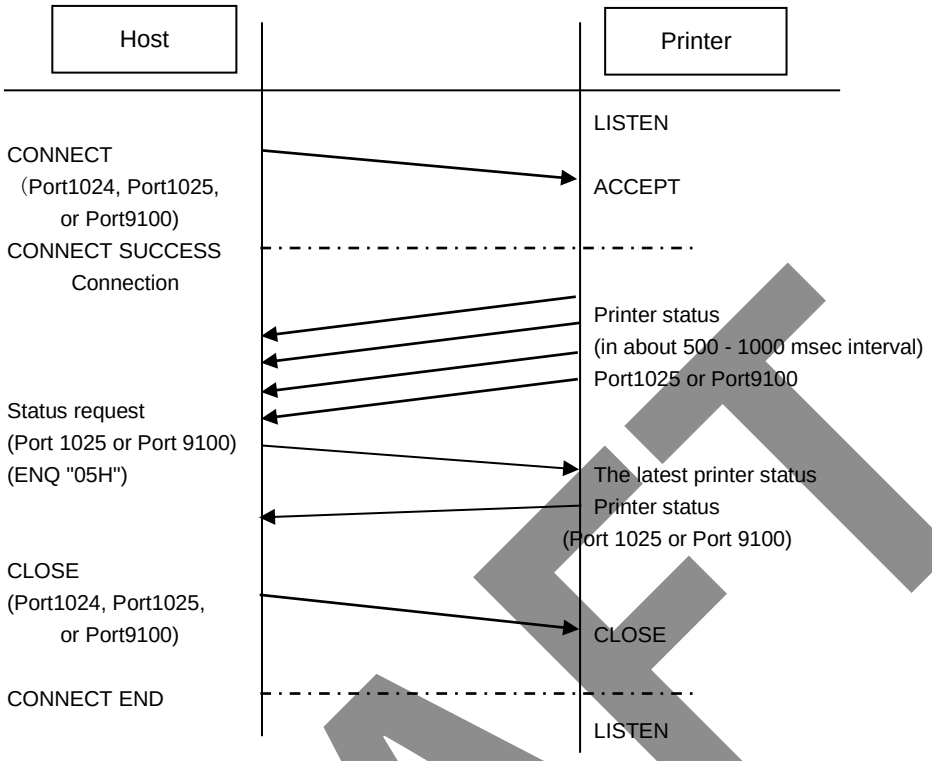
Please refer to the "2.2.2 **Return status of Status 3**" for the status contents.

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3) Sequence

(1) Status 4/Cyclic response mode (2 ports connection or 1 port connection)

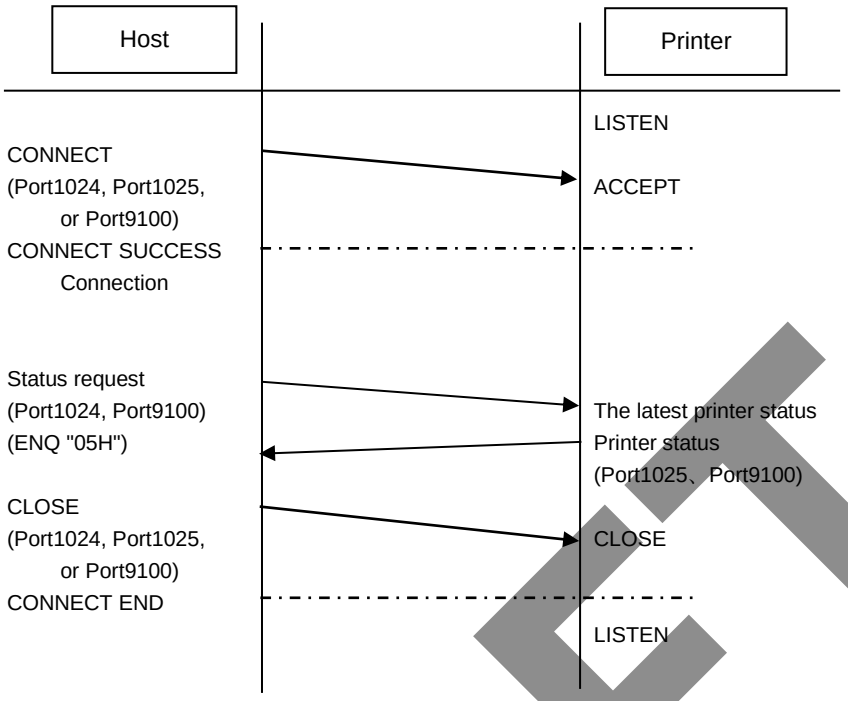
The printer will return the status in the interval of 500 to 1000 msec. When receiving a status request command (ENQ: 05H) from the host, the printer returns the latest printer status data.



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(2) Status 4/ENQ response mode (2 ports connection or 1 port connection)

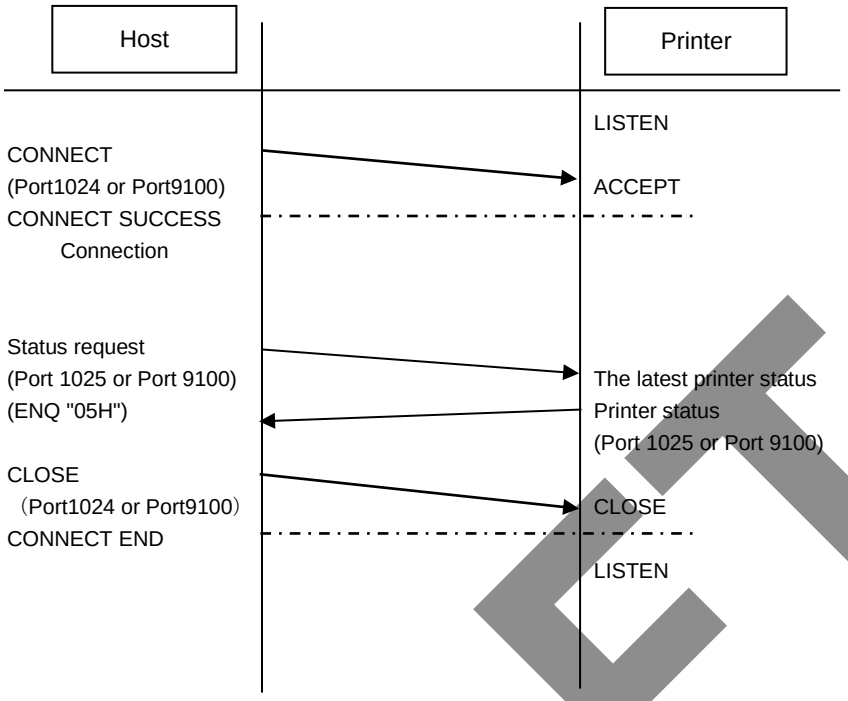
After receiving a status request command (ENQ: 05H) from the host, the printer returns the latest printer status.



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(3) Status 3, Status 5/ENQ response mode (1 port connection)

The printer returns ACK by receiving the print request command sent from the host, and returns the printer status by receiving the status request command (ENQ:05H)



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6.15 Note

6.15.1 Common to LAN/Wireless LAN interface

1) When opening or closing the print data port (Port 1024) or the status port (Port 1025) or the sending and receiving port (Port 9100), 150 msec to 200 msec interval is necessary between closing the port and opening the port again.
If the time interval after closing the port is too short, it may cause double connection. Double connection means that the connection request "CONNECT" is sent to the port (Port 1024, Port 1025 or Port 9100) already connected (CONNECT (Socket OPEN)). In this case, this connection request will be rejected "Socket CLOSE". When receiving request of double connection, the printer responds to the request for disconnection (Socket CLOSE).

6.15.2 Wireless LAN interface

1) Communication distance and transmission speed between the host and the printer(wireless LAN board) varies depending on the wireless LAN operation at the used environment.

2) It is recommended to use the printer while the field intensity is more than "Middle" when using with the Infrastructure mode.

3) Communication data may be lost when wireless LAN environment is not adequate due to mobile use of the printer or ambient conditions.

4) Please set the frequency of channels in each group are different for more than "5 channels" when multiple wireless LAN network groups are neighboring.
Example) When the channel of the group 1 is "1", set the channel of the group 2 for "6" or later.

6.15.3 LAN Interface

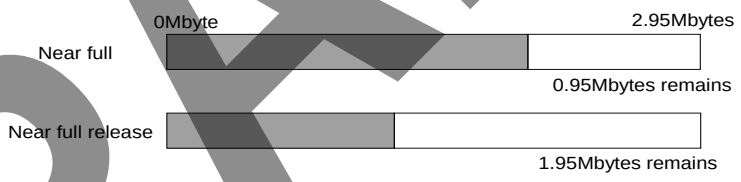
1) Connecting and disconnecting LAN cable while the printer is connecting to the PC may result in communication failure. Please avoid connecting or disconnecting the cable while the printer is ON. In case of communication failure, restart the printer.

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7 Bluetooth

Bluetooth interface of the printer complies with Bluetooth Ver.2.0 standard.

7.1 Basic Specifications

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Standards</td><td>Bluetooth Ver. 2.0+EDR Power Class 2</td></tr>
<tr><td>Communication distance</td><td>5m (at the standard measurement environment)</td></tr>
<tr><td>Used profile</td><td>Serial Port Profile(SPP) *1</td></tr>
<tr><td>Operation mode</td><td>Slave mode</td></tr>
<tr><td>Service function
(Enabled when connected to Bluetooth interface)</td><td>Bluetooth setting information print
Prints the Bluetooth setting information on the user test printing.
Bluetooth setting information default
Bluetooth setting will be defaulted back by selecting “PRINTER setting” at the default setting mode.
(Refer to the “Operator Manual” for details)</td></tr>
<tr><td>Authentication levels</td><td>Level 1 : No authentication (default)
Level 2-1 : PIN code authentication, service level
Level 2-2 : PIN code authentication, service level
Level 3 : PIN code authentication, link level</td></tr>
<tr><td>Packet type</td><td>DM5</td></tr>
<tr><td>PIN code</td><td>1 to 16 ASCII code specification (20H, 21H, 23H - 7EH)
Default Value: 0000000000000000</td></tr>
<tr><td>Power Save Mode</td><td>sniff, park, hold (operates according to the host setting)</td></tr>
<tr><td>CRC ENABLE/DISABLE</td><td>CRC: ENABLE
DISABLE (Default)</td></tr>
<tr><td>CRC Time-out period</td><td>10 seconds (fixed)</td></tr>
<tr><td>Setting of communication conditions</td><td>The below communication conditions are configurable by commands
<table>
<tr><th>Item</th><th>Commands</th><th>Setting range</th></tr>
<tr><td>Specification of Bluetooth mode</td><td><IA></td><td>Status 3
Status 4</td></tr>
</table></td></tr>
<tr><td>Receive buffer size</td><td>2.95 MB

</td></tr>
<tr><td>Code</td><td>ASCII (7 Bits), Graphic (8 Bits)</td></tr>
<tr><td>SR mode value</td><td>R1</td></tr>
<tr><td>AFH</td><td>Auto handling</td></tr>
<tr><td>Fast Connect</td><td>Supported</td></tr>
<tr><td>Pairing</td><td>Save the link key for 8 devices</td></tr>
<tr><td>Supervision timeout</td><td>Default = 20 seconds (configurable at the host)</td></tr>
<tr><td>Connection status</td><td>The connection status to the host is displayed on the LCD of the printer. Refer to the “Operator Manual” for more details.</td></tr>
</table>

*1 A method that connects 2 Bluetooth supported devices by establishing virtual serial port is defined.

[Supplemental explanation]

(1) The printer operates with the slave mode. Connect the printer by specifying printer's Bluetooth Device Address (BD address) from the master.
(2) Connection may be failed when the authentication mode, packet type and PIN code of the master is different from the above settings. When the connection is failed, check the authentication level, PIN code by test print, match the setting of the master and reconnect.
(3) Bluetooth interface and the printer is connected by serial interface internally. The transmission speed is 115200bps.
(4) When the link with Bluetooth is lost (out of area), disconnected from the printer after the supervision timeout time.
(5) When CRC check is enabled, and connection of Bluetooth is lost while sending print data (STX-ETX), partly received data will discarded after the CRC timeout time (10 seconds). When CRC check is enabled and CRC timeout is occurred for 10 seconds, please send the print data (STX-ETX) again. Also, CRC timeout is not watched when CRC check is enabled.
(6) The printer will be buffer over when the receive buffer is full. Please send print data while checking the receive buffer status by sending ENQ.
(7) Authentication level 2-1 and 2-2 are the same operation.
(8) ACK/NAK is returned only when the CRC check result is normal when CRC check is enabled.

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7.2 Bluetooth settings

The followings are Bluetooth setting items. These are configurable by the commands.

(1) Authentication level (Level 1, Level 2-1, Level 2-2, Level 3)

(2) PIN code (alphanumeric characters and symbols (20H, 21H, 23H-7EH) 1-16 digits)

PIN code (Personal Identification Number, pass key) is an authentication password in 1-16 digits used for printer identification. The PIN code is needed when the authentication level is Level 2-1, Level 2-2 and Level 3. Link key will be generated automatically after PIN code authentication and pairing start in the printer. Once the link key is generated, there is no need for PIN code authentication. The printer can be connected without checking the PIN code during the pairing.

The module of Bluetooth specification version 2.0 supports Fast Connect. Pairing information can be saved in the printer for 8 units. When pairing has done with more than 8 units, the printer deletes the oldest pairing information and save the new pairing information. (The pairing information will not be cleared by the factory clear.)

(3) Communication parameter (ISI, ISW, PSI, PSW)

ISI, ISW, PSI, and PSW are setting values of Bluetooth module. The details are as below.

Setting	Description
ISI (Inquiry Scan Interval)	Time interval of ISW (0000, 0012 - 1000) (0.625 msec unit)
ISW (Inquiry Scan Window)	Respond time against search request from the host (0000, 0011 - setting values of ISI)(0.625 msec unit)
PSI (Page Scan Interval)	Time interval of PSW (0012 - 1000) (0.625 msec unit)
PSW (Page Scan Window)	Respond time against search request from the host (0011 - setting values of PSI)(0.625 msec unit)

-Device search request from the master device can be rejected when ISI=000 and ISW=0000.

-The default values after the factory clear are ISI=0x800 (1.28 sec), ISW=0x12 (11.25 msec), PSI=0x800 (1.28 sec) and PSW=0x12 (11.25 msec).

-It is impossible to set ISI<ISW or PSI<PSW.

-The communication parameters are not necessary to be changed normally. However, communication parameters are needed to be adjusted when the field intensity is not strong enough.

(4) Device name (alphanumeric characters and symbols (20H, 21H, 23H-7EH) 1-20 digits)

By setting device name, the name can be displayed at the connected device and the printer can be identified.

Note: Only the first start-up after setting this command will process the new settings for Wireless LAN interface. Do not power off the printer when the printer is rebooted until the printer starts up normally.

7.3 CRC Transmission Data

The transfer format of send data needed to be configured as follows when CRC check mode is selected.



CRC calculation range

Item	HEX (H)	Description
STX	02	Transmission control character to initiate text
Each command	–	Each command + Parameter
ETX	03	Transmission control character to terminate text
CRC	2 bytes	Calculated by the method called CRC-ANSI. Send error control value that was calculated by CRC-16 (Generating function X16+X15+X2+1*2) in order of [High] and [Low].

1) Use this command in between Start of Data Transmission <A> and End of Data Transmission <Z>.
Set STX and ETX for print data. The printer will not print if there is no STX or ETX in the print data.

2) This is shifted to the right; therefore, the value actually used for calculation is [0xA001]. Also, initial value is set to "0".

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7.4 Calculation Example of CRC

A part of CRC calculation procedures when sending print speed set <CS> is shown below as an example.
The send data is STX <A> <CS>2 <Z> ETX. In HEX, the above will be 02 1B 41 1B 43 53 32 1B 5A 03. The underlined part is the calculation range of CRC. Generating function is described as 1010 0000 0000 0001 in BIN. 1B is the first calculation target and it is described as 0001 1011 in BIN. Initial value of CRC is set to "0".

(1) Take exclusive-OR of CRC and target data (1B), and assign its result to CRC.	0000 0000 0000 0000 XOR) 0000 0000 0001 1011 CRC = 0000 0000 0001 1011	(CRC) (1B)
(1-1) Take AND of CRC and 0001, and assign its result to A. Shift CRC 1 bit to the right and assign it to CRC.	A = 1 CRC = 0000 0000 0000 1101	
(1-2) If A = 1, take exclusive-OR of CRC and generating polynomial, and assign its result to CRC. If A = 0, no calculation is made.	0000 0000 0000 1101 XOR) 1010 0000 0000 0001 CRC = 1010 0000 0000 1100	(CRC) (polynomial)
(2-1) Perform the same calculations as (1-1). And then, perform calculations of (1-1) and (1-2) for 7 times (8 bit in total).	A = 0 CRC = 0101 0000 0000 0110	
(2-2) Perform the same calculations as (1-2). A = 0; therefore, leave CRC as it is.	CRC = 0101 0000 0000 0110	
(3-1) Perform the same calculations as (1-1).	A = 0 CRC = 0010 1000 0000 0011	
(3-2) Perform the same calculations as (1-2).	CRC = 0010 1000 0000 0011	
(4-1) Perform the same calculations as (1-1).	A = 1 CRC = 0001 0100 0000 0001	
(4-2) Perform the same calculations as (1-2).	0001 0100 0000 0001 XOR) 1010 0000 0000 0001 CRC = 1011 0100 0000 0000	(CRC) (polynomial)
(5-1) Perform the same calculations as (1-1).	A = 0 CRC = 0101 1010 0000 0000	
(5-2) Perform the same calculations as (1-2).	CRC = 0101 1010 0000 0000	
(6-1) Perform the same calculations as (1-1).	A = 0 CRC = 0010 1101 0000 0000	
(6-2) Perform the same calculations as (1-2).	CRC = 0010 1101 0000 0000	
(7-1) Perform the same calculations as (1-1).	A = 0 CRC = 0001 0110 1000 0000	
(7-2) Perform the same calculations as (1-2).	CRC = 0001 0110 1000 0000	
(8-1) Perform the same calculations as (1-1).	A = 0 CRC = 0000 1011 0100 0000	
(8-2) Perform the same calculations as (1-2).	CRC = 0000 1011 0100 0000	
Calculation of CRC up to 1B has completed. In the same manner, perform calculations of the next target data 41, and continue calculating up to 03. In this case, it will be EC 5E.	Calculation result up to 03 CRC = 1110 1100 0101 1110	

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7.5 Transmission Data Example

The following are the example of transmission data.

(1) Print Data
STX
<A>
<X22>,SATO
<Q>0001
<Z>
ETX
71H 9CH

HEX data to be actually sent is described as follows. Underlined part is CRC.
02 1B 41 1B 58 32 32 2C 53 41 54 4F 1B 51 30 30 30 31 1B 5A 03 71 9C

(2) Print speed setting command
STX
<A>
<CS>2
<Z>
ETX
ECH 5EH

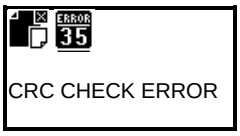
HEX data to be actually sent is described as follows. Underlined part is CRC.
02 1B 41 1B 43 53 32 1B 5A 03 EC 5E

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7.6 CRC errors

The printer calculates the CRC of every items of received data and checks the validity of the received data by comparing it with the CRC in the received data. When the calculated CRC is not the same as the CRC in the received data, the printer judges the data is incorrect, arises CRC error and stops printing.

The LCD display of CRC error



* The CRC error will be detected only when the CRC check is enabled.

There are 3 ways to release the CRC error.

(1) Press the LINE key	: the printer will resume the printing from the print data with the CRC error.
(2) Send CAN command	: the printer will clear all contents in the receive buffer including the print data with the CRC error.
(3) Press the CANCEL key	: the printer will cancel the print data with the error and resume the printing from the next print data.

[Supplemental explanation]

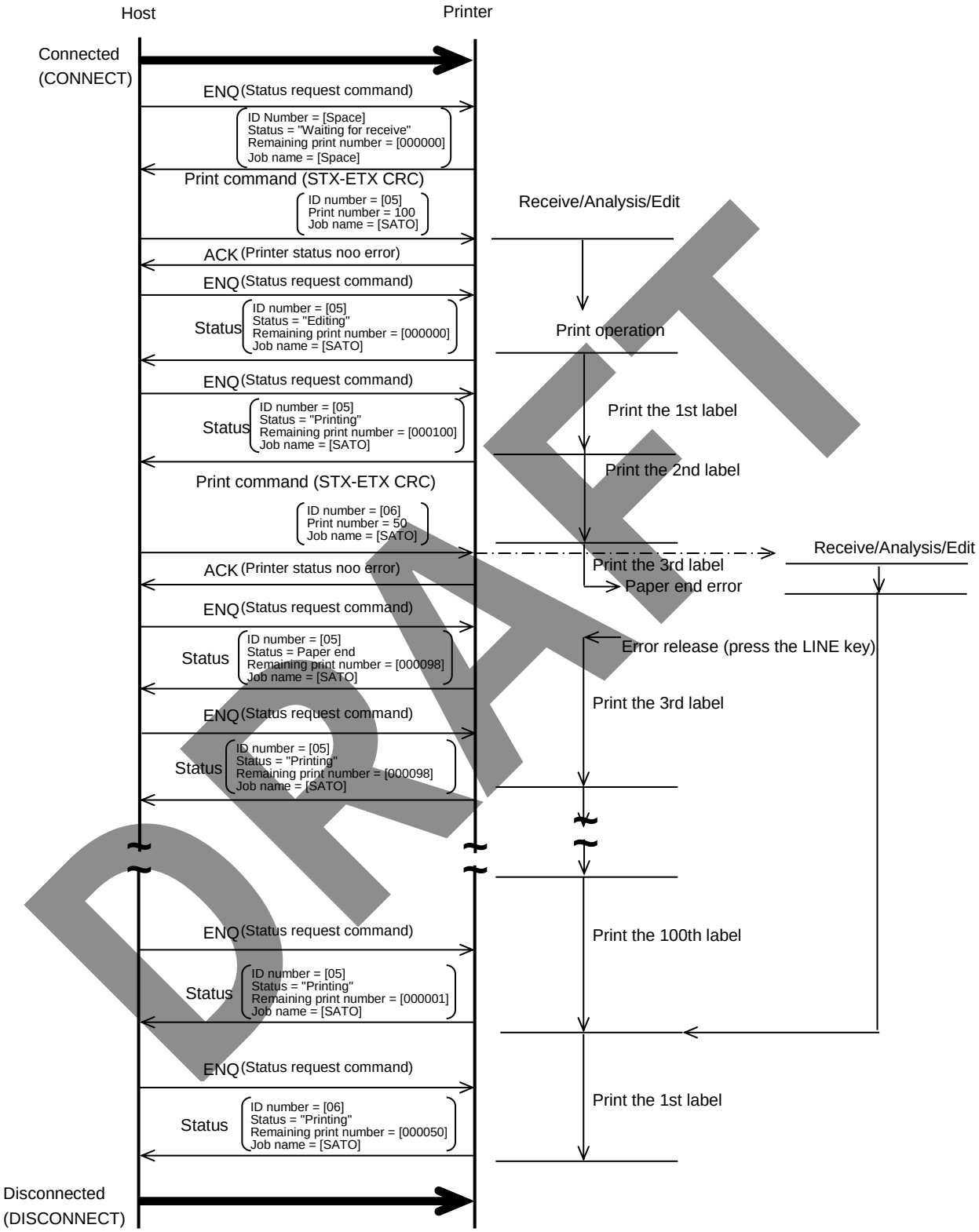
1. The return status of the Status 3 and 4 at the CRC error will be "other errors".
2. The error will not be displayed at the CRC time out error.

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7.7 Transmission Sequence

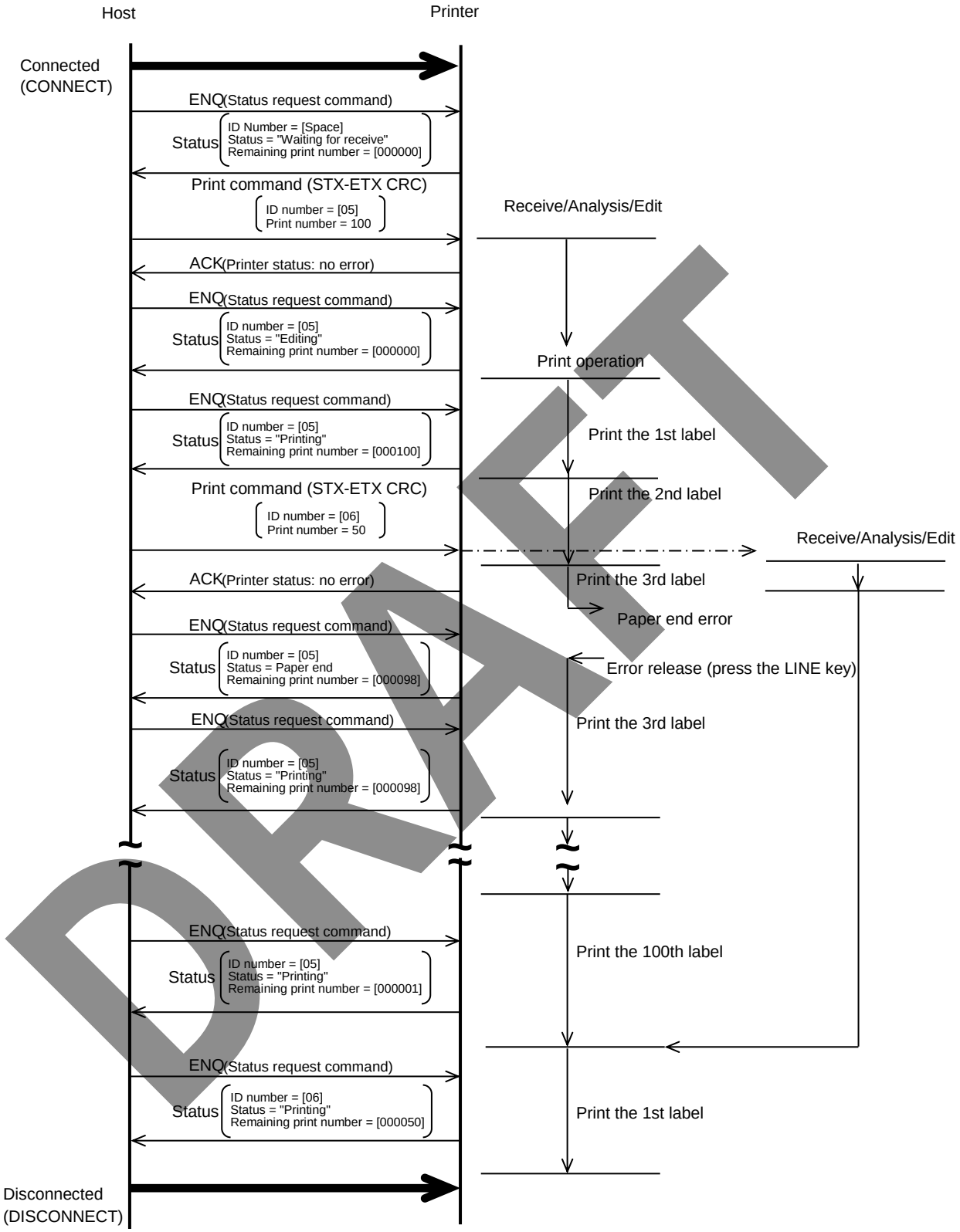
7.7.1 Normal end

7.7.1.1 Status 4 (when CRC check is enabled)



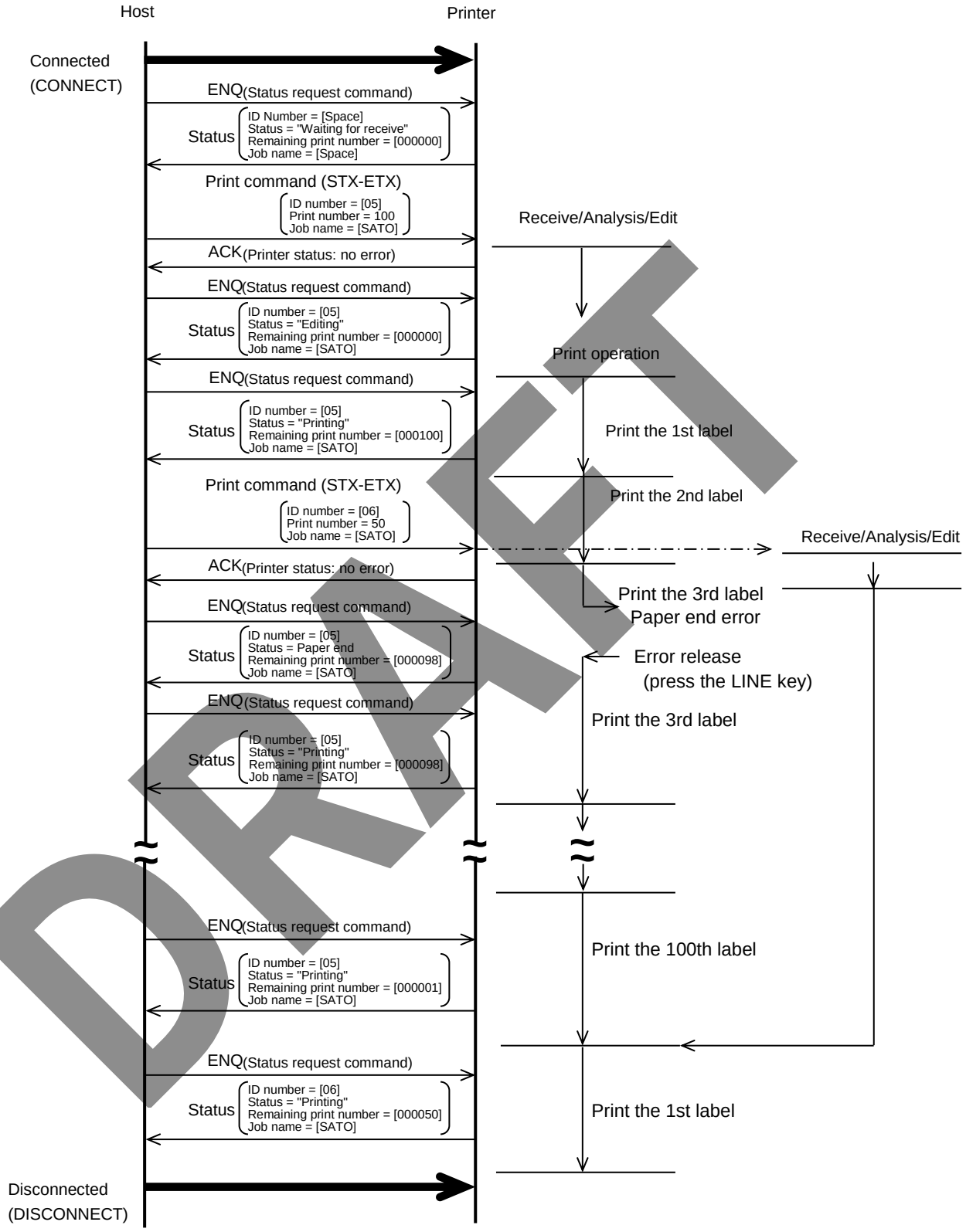
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7.7.1.2 Status 3 (when CRC check is enabled)



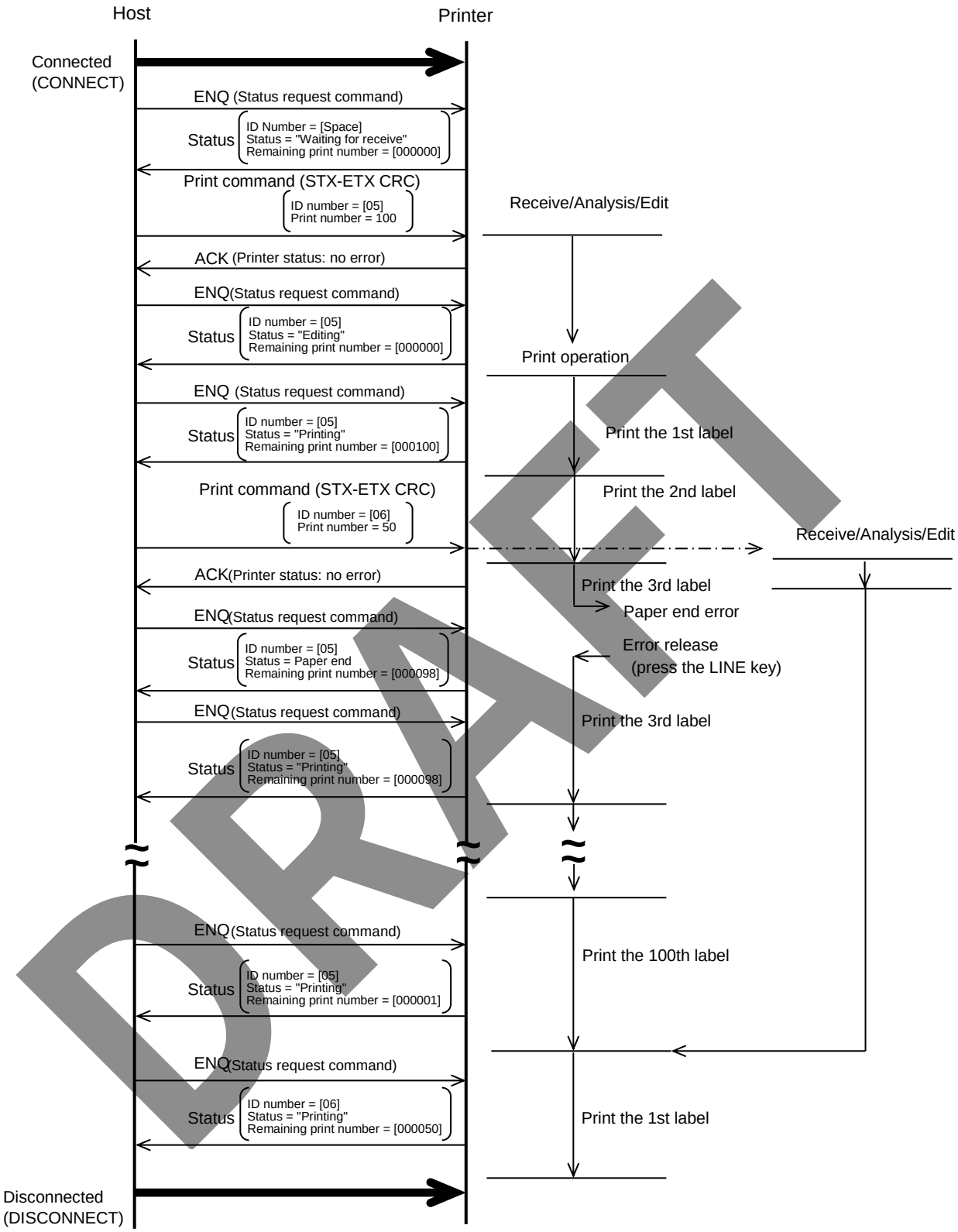
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7.7.1.3 Status 4 (when CRC check is disabled)



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7.7.1.4 Status 3 (when CRC check is disabled)



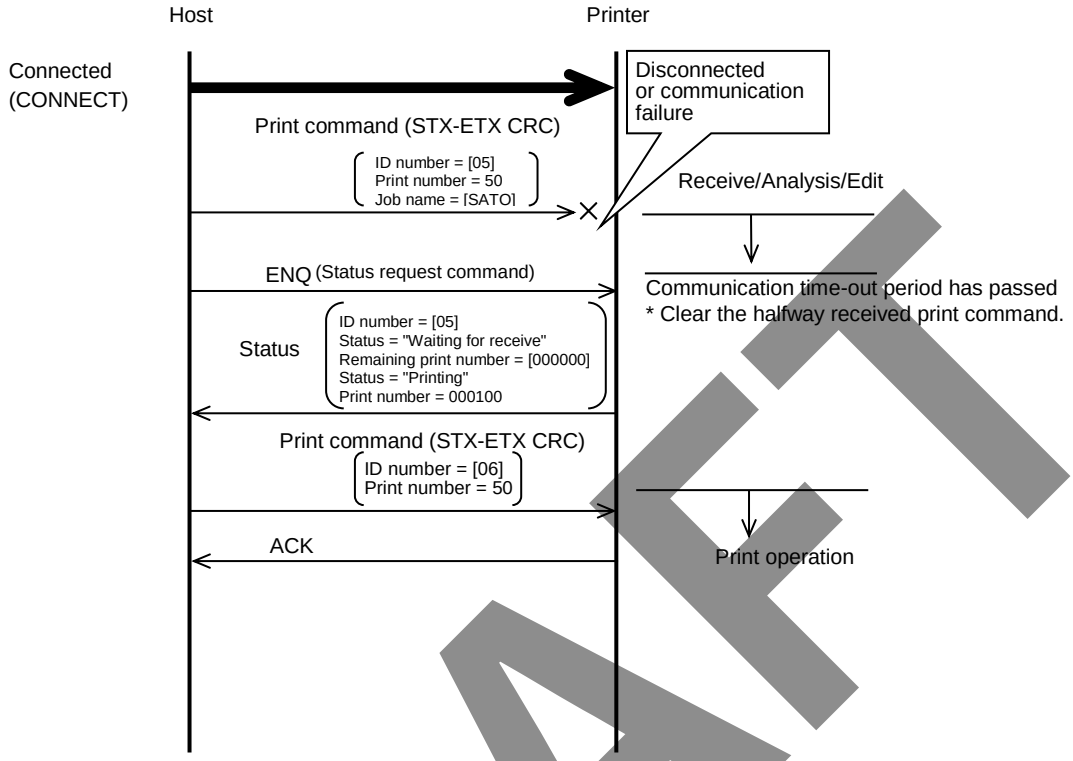
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7.7.2 Disconnection During Print data sending

[Note]

The print data may be lost when Bluetooth communication is disconnected during the print data sending. Please resend the data after printer power off and on.

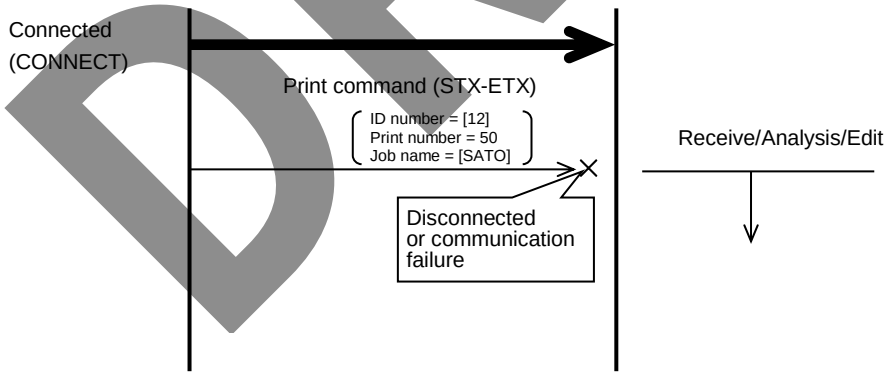
7.7.2.1 When CRC check is enabled (common to Status 3 and 4)



[Note]

When connection of Bluetooth is lost while sending print data (STX-ETX), partly received data will discarded after the communication timeout time (10 seconds).

7.7.2.2 When CRC check is disabled (common to Status 3 and 4)



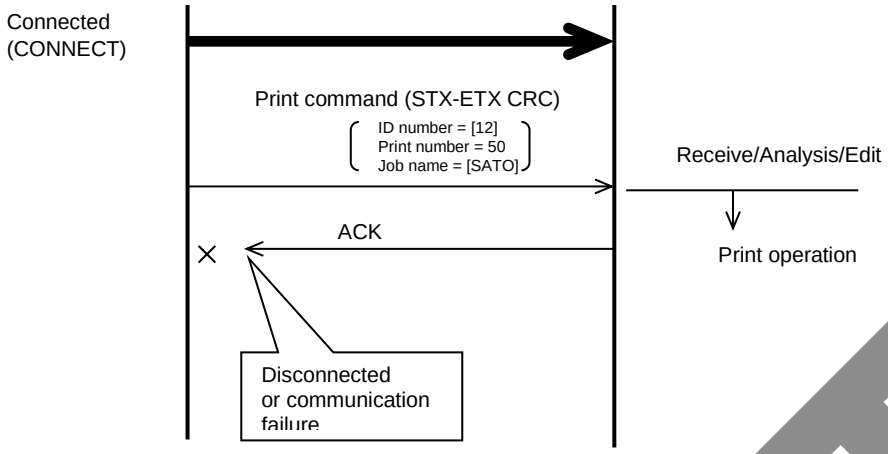
[Note]

The print data may be lost when Bluetooth communication is disconnected during the print data sending. Please resend the data after printer power off and on.

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7.7.3 Disconnection during status sending after print data reception

7.7.3.1 When CRC check is enabled (common to Status 3 and 4)



[Notes]

1. When there is no ACK returned, stop the transmission as it appears that some sort of communication interference is occurring.
2. ACK return may be lost when Bluetooth is disconnected before the printer returning ACK.

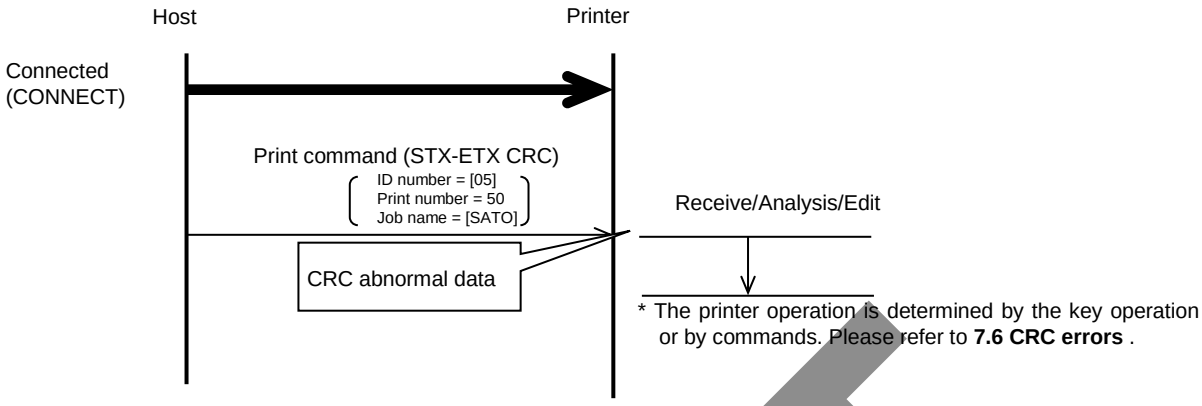
7.7.3.2 When CRC check is disabled (common to Status 3 and 3,4)

The printer operation is the same as 7.7.3.1 when CRC check is enabled.

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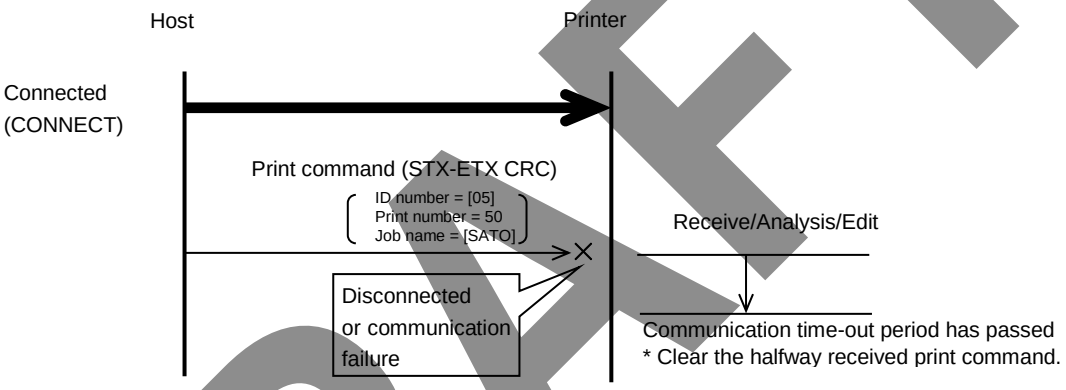
7.7.4 Abnormal end when CRC check is enabled

7.7.4.1 At the CRC error (common to Status 3 and 4)



[Note]
The printer will clear the print data and will not return ACK/NAK when the received data has CRC error.

7.7.4.2 At the communication time out (common to Status 3 and 4)



[Note]
When there is no data come in to the printer during print command reception for communication time out period (10 sec), the printer will time out and clear the partly received print command.(ACK/NAK will not be returned.)

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7.7.5 State transition diagram matrix (at host)

7.7.5.1 Status 3

Status \ Event		A Connect response (CONNECT)	B Disconnect response (DISCONNECT)	c Print request	D Return status receive	E ACK/NAK receive	F Timeout	G Send connect request (CONNECT)	H Send disconnect request (DISCONNECT)
(1)	Neutral	-	-	-	-	-	-	(1) Timer register (2) Connect request (CONNECT) -> (2)	-
(2)	Waiting for connection	Connection complete -> (3)	Disconnected -> (1)	-	-	-	Abnormal end -> (1)	-	Disconnected (DISCONNECT) -> (1)
(3)	Connecting	-	Disconnected -> (1)	(1) Timer registration (2) Status request command send -> (4)	-	-	Disconnected (DISCONNECT) -> (1)	-	Disconnected (DISCONNECT) -> (1)
(4)	Return status Waiting for response	-	Disconnected -> (1)	-	(1) Timer release/Timer reregistration (2) Normal printer status Send the print data -> (5) (3) Normal printer status -> (3)	-	(1) When not up to retry times Send status request command -> (4) (2) Retried until the retry times -> (1)	-	Disconnected (DISCONNECT) -> (1)
(5)	Waiting for ACK response	-	Disconnected -> (1)	-		ACK/NAK receive Timer release -> (3)	Disconnected (DISCONNECT) -> (1)	-	Disconnected (DISCONNECT) -> (1)

[Notes]

1. The same timer is used for waiting for connection, waiting for status return, and waiting for ACK response to be able to simplify the above matrix.
2. The printer cannot disconnect (send DISCONNECT) at the power off. Please set up time out process at the host.
3. Make sure to check the printer status by sending status request command (ENQ) before sending any print data because the printer cannot print during printer error.
4. When (5) Time out for ACK response occurred, assuming that the LINK has been disconnected, power off and on the printer and reconnect.

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7.7.5.2 Status 4

Status \ Event		A Connect response (CONNECT)	B Disconnect response (DISCONNECT)	c Print request	D Return status receive	E ACK/NAK receive	F Timeout	G Send connect request (CONNECT)	H Send disconnect request (DISCONNECT)
(1)	Neutral	-	-	-	-	-	-	(1) Timer registration (2) Connect request (CONNECT) -> (2)	-
(2)	Waiting for connection	Connection complete -> (3)	Disconnected -> (1)	-	-	-	Abnormal end -> (1)	-	Disconnected (DISCONNECT) -> (1)
(3)	Connecting	-	Disconnected -> (1)	(1) Timer registration (2) Status request command send -> (4)	-	-	Disconnected (DISCONNECT) -> (1)	-	Disconnected (DISCONNECT) -> (1)
(4)	Return status Waiting for response	-	Disconnected -> (1)	-	(1) Timer release/Timer reregistration (2) Normal printer status Send the print data -> (5) (3) Normal printer status -> (3)	-	(1) When not up to retry times Send status request command -> (4) (2) Retried until the retry times -> (1)	-	Disconnected (DISCONNECT) -> (1)
(5)	Waiting for ACK response	-	Disconnected -> (1)	-		ACK/NAK receive Timer release -> (3)	Disconnected (DISCONNECT) -> (1)	-	Disconnected (DISCONNECT) -> (1)

[Notes]

1. The same timer is used for waiting for connection, and waiting for status return, to be able to simplify the above matrix.
2. The printer cannot disconnect (send DISCONNECT) at the power off. Please set up time out process at the host.
3. Make sure to check the printer status by sending status request command (ENQ) before sending any print data because the printer cannot print during printer error.
4. When (5) Time out for ACK response occurred, assuming that the LINK has been disconnected, power off and on the printer and reconnect.

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7.7.5.3 State transition diagram matrix (at printer)

Status \ Event		A Connect request (CONNECT)	B Disconnect request (DISCONNECT)	C Print Data receiving	D Print complete	E Error	F Error release	G Power off
(1)	Waiting for connect request	Receive connect request (CONNECT) -> (2)	Ignore	Ignore	-	Ignore	-	Power off
(2)	Connecting	Ignore	Disconnect process (DISCONNECT)	Normal data receive ACK/NAK send -> (3) Abnormal data receive -> (2) CRC error *1 Clear the received data -> (2) Communication time out Clear the received data *1 -> (2)	Ignore	-> (4)	-	Power off
(3)	Printing	Ignore	Disconnect process (DISCONNECT)	Ignore	-> (2)	-> (4)	-	Power off
(4)	Error	Ignore	Disconnect process (DISCONNECT)	Ignore	Ignore	Ignore	Other than printing -> (2) Printing -> (3)	Power off

*1 when CRC check is enabled

[Notes]

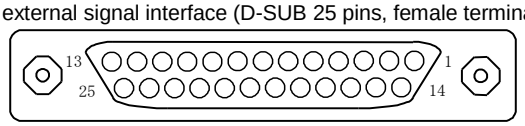
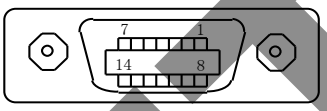
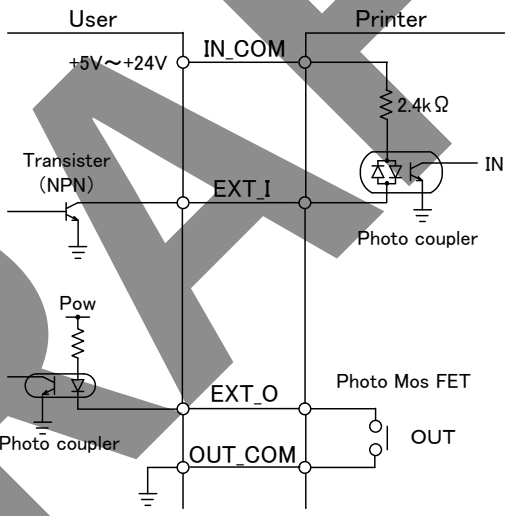
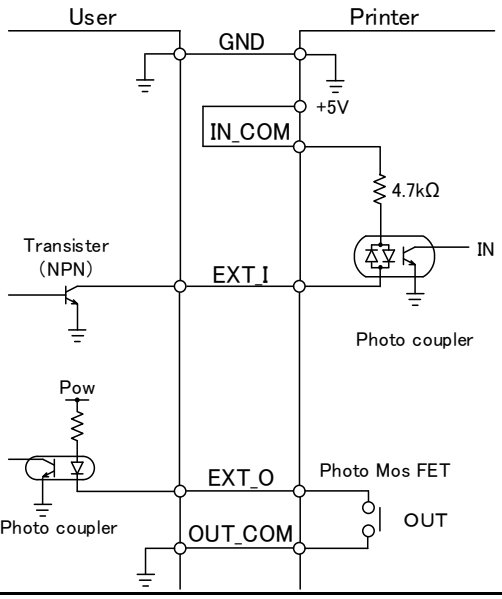
1. When the link with Bluetooth is lost (out of area), disconnect from the printer after the supervision timeout time.
   When the link between the host is lost, the printer request disconnection (DISCONNECT) after the supervision timeout time (default=20 sec (changeable from the host)) has passed.
2. It takes about 5 sec from the printer power on, installed Bluetooth module starting up to be the status of (1). Before the status of (1), it may not be connected.
3. ACK/NAK will not be returned at the CRC error or communication timeout.
4. Make sure to check the printer status by sending status request command (ENQ) before sending any print data because the printer cannot print during printer error.
5. The status check of Bluetooth I/F board is done at after the factory clear, Bluetooth mode switch, PIN code setting, and Bluetooth setting only.
   In case of disconnection during operation, please check the status of Bluetooth I/F board by switching the Bluetooth mode.

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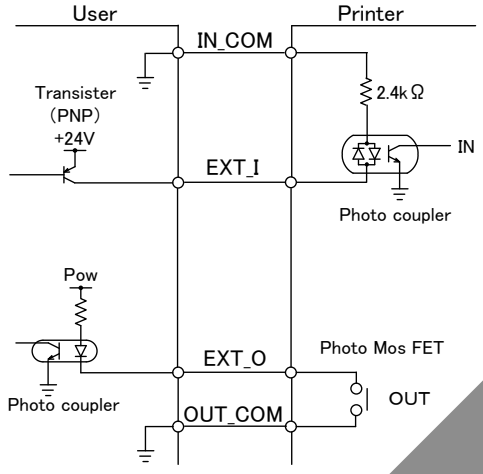
8 External signal interface

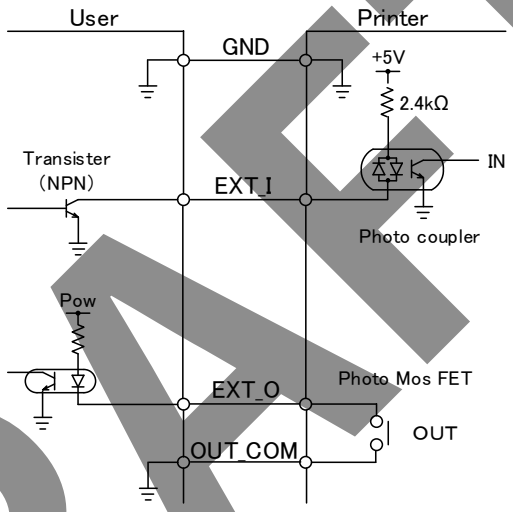
8.1 Basic Specifications

External interfaces are designed to be able to connect with the printer and the other peripherals.
The external interface operates only in the pulse input mode (a mode that operate according to external signals).
However, error signals are outputted with the all mode.
Setting related to the external signals can be done on the extended setting mode at the printer.

Connector	(1)25 pins external signal interface (D-SUB 25 pins, female terminal)  (2) 14 pins external signal interface (amphenol 14 pins, female terminal) * When using 14 pins external signal interface, please use the attached conversion cable. 
Input/Output circuit diagram	(1)25 pins external signal interface (D-SUB 25 pins, female terminal) a) When the output from the user is NPN transistor output [Power is supplied from the user]  [Power is supplied from the printer] 

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<table>
<tr><td>Input/Output circuit diagram</td><td>
b) When the output from the user is PNP transistor output


(2)14 pins external signal interface (amphenol 14 pins, female terminal)


</td></tr>
<tr><td>Signal level</td><td>High high impedance input terminal Iin≒0mA output terminal Iout≒0mA
Low 0 - 0.7V input terminal Iin≒2 - 20mA output terminal Iout≒120mA</td></tr>
<tr><td>External signal print order</td><td>ENABLE or DISABLE can be selected on the extended setting mode.</td></tr>
<tr><td>External signal type</td><td>The below signal types are selectable on the extended setting mode.
<table>
<tr><th>Type</th><th>Operation details</th></tr>
<tr><td>TYPE I</td><td>The print complete signal (PREND) is High before label printing, and it becomes Low after print completion. The signal level becomes High after 20 msec.</td></tr>
<tr><td>TYPE II</td><td>The print complete signal (PREND) is Low before label printing, and it becomes High after print completion. The signal level becomes Low after 20 msec.</td></tr>
<tr><td>TYPE III</td><td>The print complete signal (PREND) is High before label printing, and it becomes Low from the start to the end of print, and it becomes High again after print completion.</td></tr>
<tr><td>TYPE IV</td><td>The print complete signal (PREND) is Low before label printing, and it becomes High from the start to the end of print, and it becomes Low again after print completion.</td></tr>
</table>
</td></tr>
<tr><td>External signal reprint</td><td>The following can be selected on the extended setting mode.
ENABLE: reprint the same contents for one time.
DISABLE: no reprint</td></tr>
</table>

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8.2 Connector Pin Assignment

No		Signal name	Description	Input/ Output	Level	Electrical conditions Voltage, Current (MAX)
25 pins	14 pins					
1	14	FG	FRAME GROUND	-	-	-
2	-	+5V	Power source	-	-	600mA
3	-	-	-	-	-	-
4	4	Machine error	Output with cover open, head error, communication error and so on.	Output	Low	400V 80mA
5	6	Print completion signal (PREND)*	Signal is output at the operation of the printer issues one label.	Output	Low	400V 80mA
6	9	Online *3	Output when the printer is offline state.	Output	Low	400V 80mA
7	-	Label near end	By input of this signal, the printer becomes label near end status.	Input *2	Low	High: high impedance Low: more than -5mA, 0V
8	7	Reprint signal (PRIN2)	By input of this signal, the printer reprints the same contents for one time.	Input *2	Low	High: high impedance Low: more than -5mA, 0V
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	OUT_COM	GROUND of peripherals	-	-	-
12	13	+5V	Power source	-	-	600mA
13	12	+24V	Power source	-	-	2A
14	2	GND	SIGNAL GROUND	-	-	-
15	2	OUT_COM	GROUND of peripherals	-	-	-
16	3	Ribbon end	Output at ribbon end detection.	Output	Low	400V 80mA
17	1	Paper end	Output at paper end detection.	Output	Low	400V 80mA
18	10	Ribbon near end	Output at ribbon near end detection.	Output	High	400V 80mA
19	-	-	-	-	-	-
20	5	Print start signal (PRIN)	The printer issues one label by input of this signal.	Input *2	Low	High: high impedance Low: more than -5mA, 0V
21	11	Label feed	The printer feeds by input of this signal.	Input *2	Low	High: high impedance low: more than -5mA, 0V
22	-	-	-	-	-	-
23	-	-	-	-	-	-
24	13	IN_COM *1	For power supply from peripherals.	Input	-	5V - 24V or GND
25	-	GND	SIGNAL GROUND	-	-	-

1) Please select one type from TYPE I to TYPE IV for "PREND" output signal of No. 5 pin. Refer to external signal type in "8.1Basic Specifications " for more details.

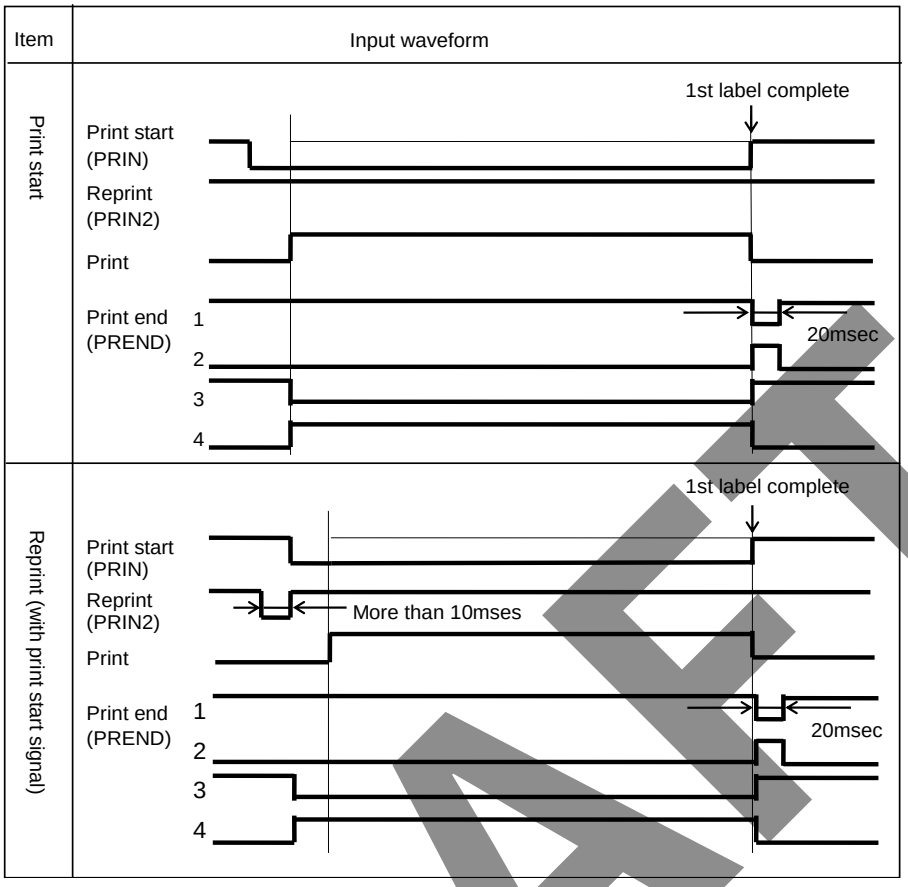
[Supplemental explanation]
The pin No. and signal name (contents) can be changed on the extended setting mode. Refer to the item of "Input/Output signal setting" in the "Operator Manual" for more details.

[Notes]
*1 When use the 14 pins external signal interface, be not connect the power pin to 「IN_COM」pin.
The 「IN COM」 pin is connect to 「5V」 in cable.
*2 It can be connected to equipment of open collector input to the signal input terminal.
*3 This is when “EXT 9PIN SELECT” in the service mode is MODE2. Signal is output with remaining print number status when it is MODE1.

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8.3 Explanation of input/output signal

1) Input signal

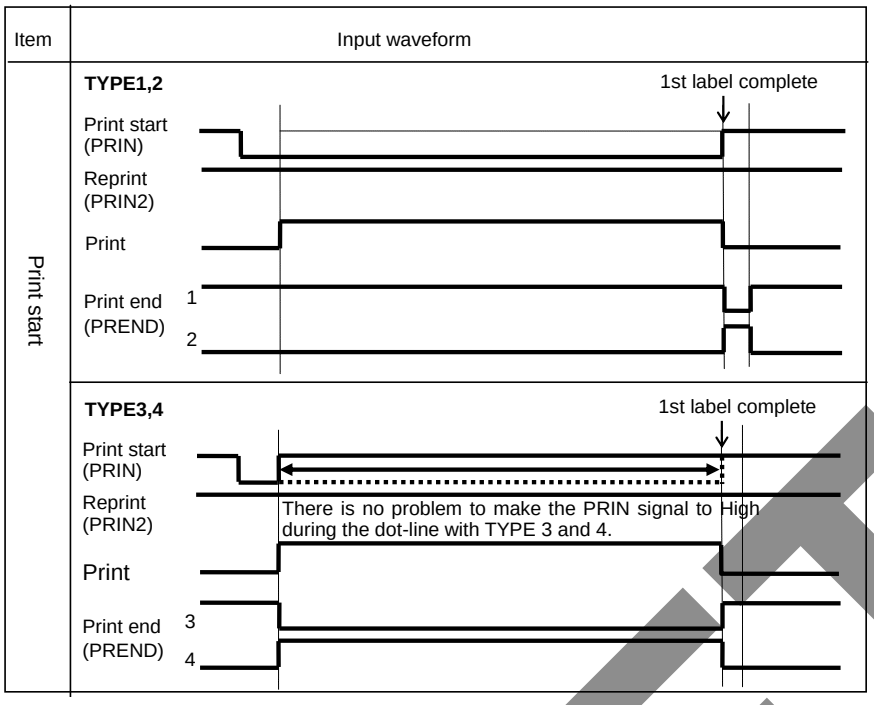


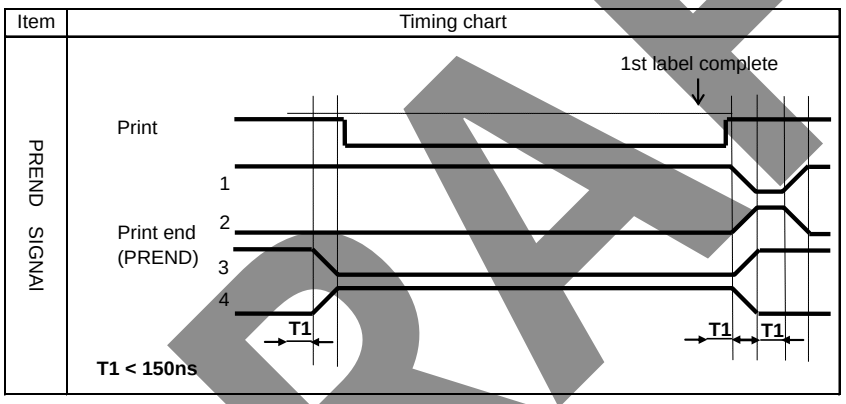
[Supplemental explanation]

1. Please keep the print start signal (PRIN) to "Low" until print completion signal (PREND) is output.* (Refer to the below [Maintaining the print start signal (PRIN) keep]) Also, output reprint signal (PRIN2) for more than 10 msec. When signal is output for shorter than 10 msec, and reprint signal is not acknowledged, the printer will not reprint.

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[Maintaining the print start signal (PRIN)]





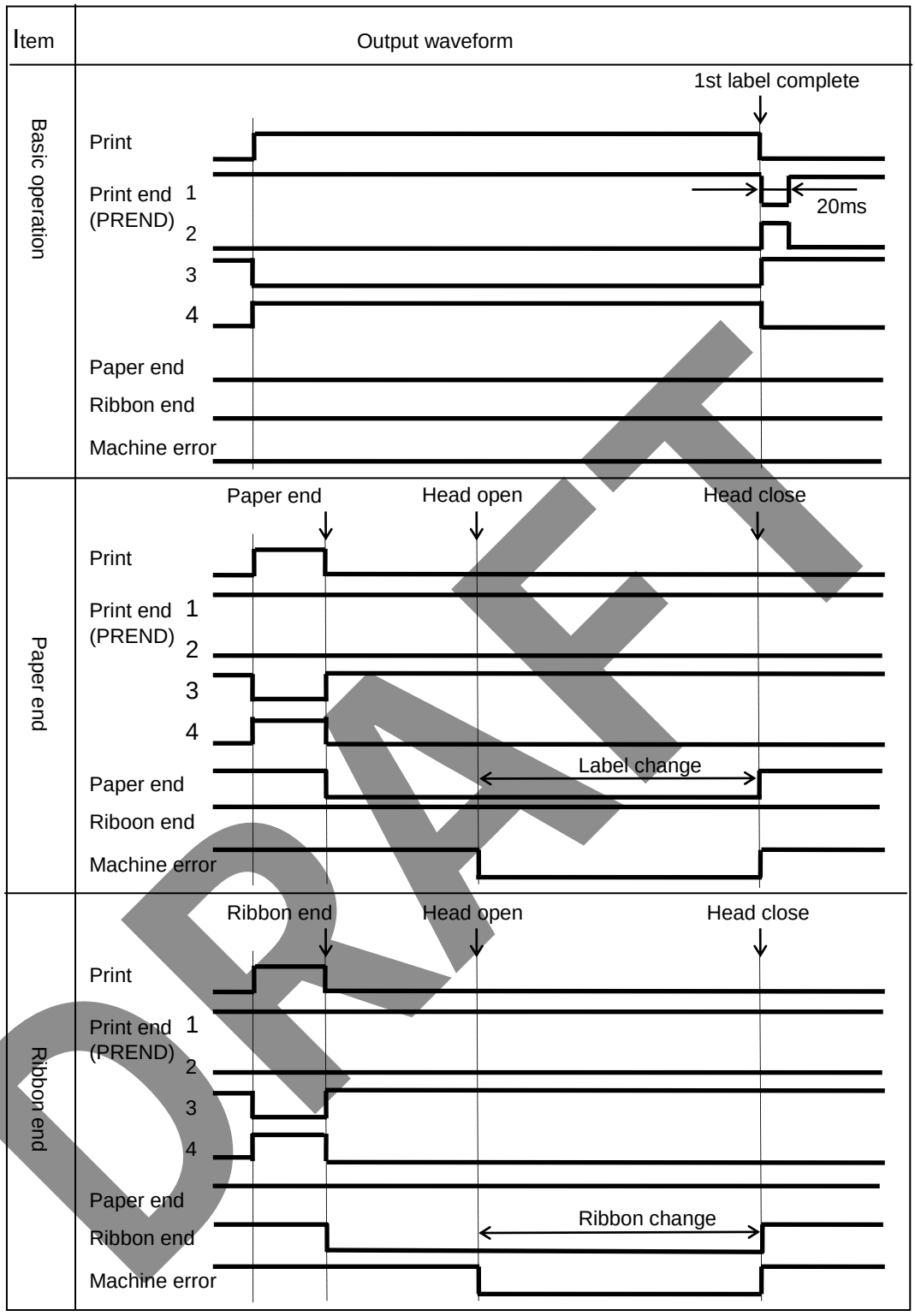
*Rise or fall time of PREND signal is less than 150 ns. Please consider the time when output signal from the connected devices.

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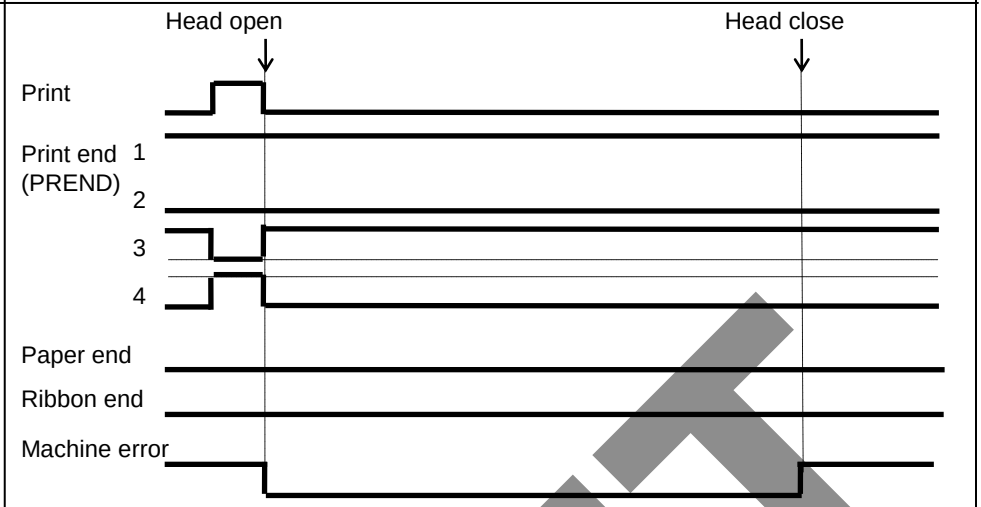
2. When the print start signal and reprint signal are output simultaneously, the print start signal is enabled and the printer will not reprint.
3. The reprint signal is only valid from the print operation end (QTY=0) until the next print data reception. Other than that, the printer will not reprint.

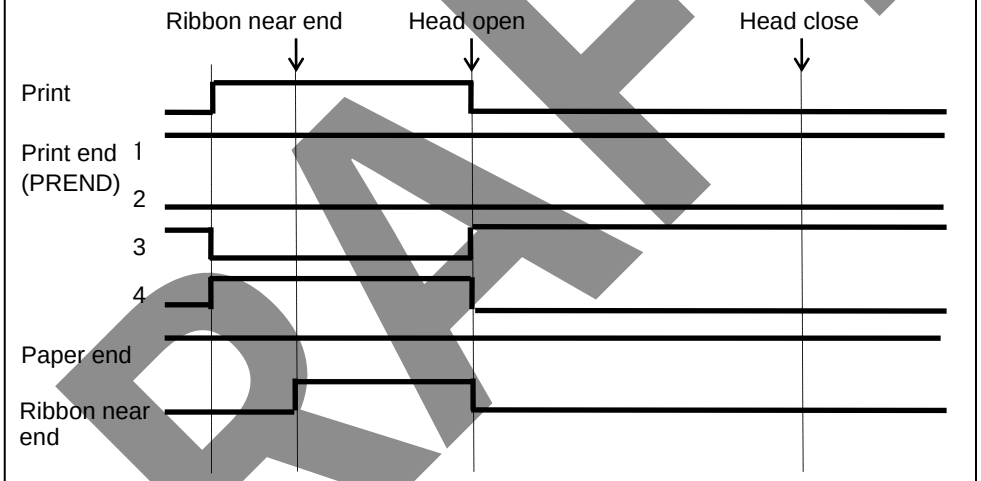
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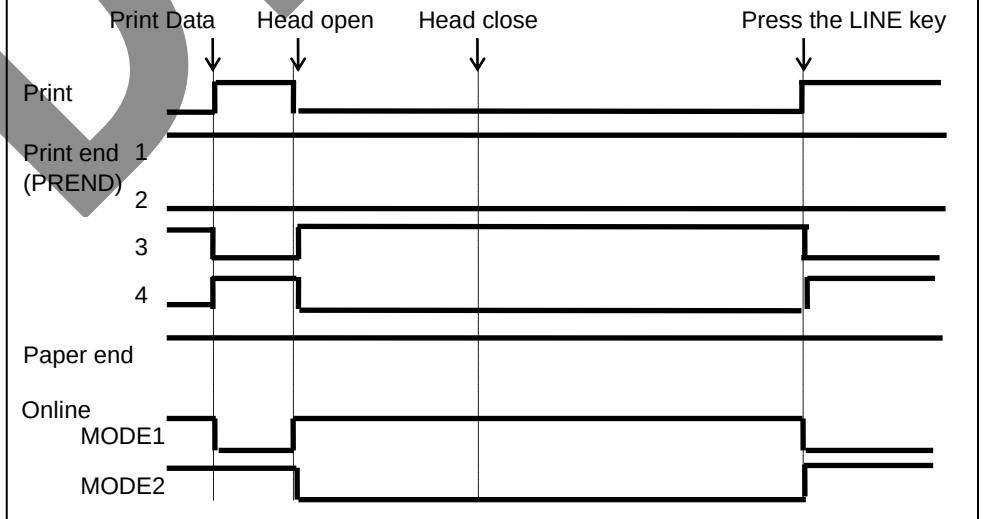
1) Output signal



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Item	Output waveform
Machine error	

Item	Output waveform
Ribbon near end	

Item	Output waveform
Online	

Select MODE1 or MODE2 with “EXT 9PIN SELECT” in the service mode.

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9 USB Host

9.1 Basic Specifications

USB interface of the printer complies with USB2.0 standard.

Interface	
Connector	Series A plug Cable length shorter than 5 m (Twisted pair shielded)
Version	USB 2.0 High speed
Device class	Mass storage class
Used for	USB memories

9.2 Connector Pin Assignment

Pin number	Name
1	VBus
2	-Data(D-)
3	+Data(D+)
4	GND

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10 Note

■Operation after turning the printer’s power off

Please note that the data sent from the host to the printer after turning the printer’s power off is not ensured.

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Extensive contact information for worldwide SATO operations can be found on the Internet at **www.satoworldwide.com**