

TOSHIBA

TOSHIBA Portable Printer

B-EP Series

External Equipment Interface Specification

1st Edition:	September 19, 2008
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3rd Edition:	February 6, 2013
4th Edition:	June 20, 2013
5th Edition:	June 4, 2014
6th Edition:	December 5, 2014

TOSHIBA TEC CORPORATION

MODIFICATION HISTORY

EAA-02465

EXTERNAL EQUIPMENT INTERFACE SPECIFICATION

Date	Modified Pages	Description
Sep. 19, 2008	–	Newly published.
May 11, 2009	2-2	2.3 WEIGHT and 2.5 HEAD SPECIFICATION: Values were changed.
	3-4 to 7, 45, 46, 48, 49	3.2.3 TRANSMISSION CONTROL: 3.5.2 NOTES WHEN SENDING A COMMAND: (including Ir packet error) was added to Command syntax error.
	3-40, 41, 42, 51, 53, 74, 77	The following sections were added: 3.2.9/3.3.1/3.4.1/3.5.3/3.6.1/3.7.4/3.8.4 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE
	3-43	3.5 RS-232C INTERFACE: Received buffer was changed from 64K bytes to 512K bytes.
	3-76	3.8.3.1 INFRASTRUCTURE MODE (ESS): 3.8.3.2 ADHOC MODE (IBSS): Time-related description was added.
	4-6 to 25	The following sections were added: 4.2.3 HANDLING OF RECEIVED DATA BY COMMAND 4.2.3.1 BIT MAP FONT FORMAT COMMAND 4.2.3.2 BARCODE/2-D CODE FORMAT COMMAND 4.2.3.3 GRAPHIC COMMAND 4.2.3.4 PC SAVE COMMAND
	4-29 to 42	The following sections were added: 4.3.3 HANDLING OF RECEIVED DATA BY COMMAND 4.3.3.1 COMMAND PROCESSING 4.3.3.2 FORM STORE COMMAND 4.3.3.3 GRAPHIC DATA STORE COMMAND
	4-47 to 51	The following sections were added: 4.4.3 HANDLING OF RECEIVED DATA BY COMMAND 4.4.3.1 PAGE MODE PROCESSING
	4-56 to 60	The following sections were added: 4.5.3 HANDLING OF RECEIVED DATA BY COMMAND 4.5.3.1 PAGE MODE PROCESSING
	5-1, 2, 6-1, 2	5.1/6.1 GENERAL DESCRIPTION: Descriptions were changed.
	5-7, 6-6	5.3.1/6.3.1 LABEL SIZE SET COMMAND: Paper thickness was added to the lists.
5-14 to 16	5.4.1 PRINT START POSITION FINE ADJUST COMMAND: [Explanation] (5) Descriptions were added. [Explanation] under (5) was deleted. [Strip position fine adjustment] Figures were changed when the label-to-label gap is 3 mm. Figures were added when the gap is 7 mm. (up to V1.0C) was added. [Notes] (6), (7) and (8) were added.	

Date	Modified Pages	Description
May 11, 2009 (Continued)	5-18, 19, 7-10, 11, 10-11, 12	5.4.2/7.4.3/10.7.2 PRINT DENSITY FINE ADJUST COMMAND: [Term] Terms were added to [d]: 3: Print quality oriented, 5: Auto2 [Explanation] (6) Descriptions were added.
	5-33	5.6.2 BIT MAP FONT FORMAT COMMAND: Point counts were added for Gothic725 Black.
	5-41	5.6.2 BIT MAP FONT FORMAT COMMAND: [Explanation] (10), (11) Descriptions were added.
	5-141	5.7.1 BIT MAP FONT DATA COMMAND: The max. number of characters was changed from 64 to 63.
	5-164	5.8.1 ISSUE COMMAND: [Explanation] (4) Status response-related description was deleted.
	5-167	5.8.2 FEED COMMAND: [Notes] (4) Description was added.
	5-191	5.12.3 SAVED DATA READ COMMAND: [Notes] (6) Descriptions were added.
	5-192	5.13.1 HEAD BROKEN DOTS CHECK COMMAND: [Explanation] (2), (3) and (4) Descriptions were added.
	5-193	5.13.2 MESSAGE DISPLAY COMMAND: [Notes] (2) A 'head' was changed to a 'cover.'
	5-196, 6-73, 7-42	5.14.1 RESET COMMAND: 6.12.1/7.9.1 INITIALIZE COMMAND: [Notes] (3) USB interface-related descriptions were deleted.
	5-198, 199, 201, 6-57, 58, 75, 76, 79, 7-43, 44, 46, 8-88, 89, 91, 10-16, 17, 19, 20	5.15.1/6.13.1/7.10.1/8.11.3/10.9.1 STATUS REQUEST COMMAND: 5.12.2/6.13.2/7.10.2/8.11.4 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND: 6.6.1 DATA PRINT COMMAND: (including Ir packet error) was added to Command syntax error.
	5-204, 205 6-82, 83, 7-49, 8-94, 95, 10-22	5.15.3/6.13.3/7.10.3/8.11.5/10.9.2 MODE INFORMATION ACQUIRE COMMAND: Spaces (■) are added to the lists.
	6-12, 13	6.4.1 PRINT START POSITION FINE ADJUST COMMAND: [Explanation] (10) Descriptions were added. [Notes] Terms were added to (3), (7) and (8) were added.
	6-14, 15	6.4.2 PRINT DENSITY FINE ADJUST COMMAND: [Term] Terms were added to [d]: 3: Print quality oriented, 5: Auto2 [Explanation] (7) Descriptions were added.
	6-57	6.6.1 DATA PRINT COMMAND: [Explanation] (12) Status response-related description was deleted.
6-67	6.9.1 GRAPHIC DATA STORE COMMAND: [Term] The max. number of dots was changed.	

Date	Modified Pages	Description
May 11, 2009 (Continued)	7-24	7-5-10 NO. OF COLUMNS (STRINGS) COMMAND: The number of columns was represented in hex.
	8-67	8.10.47 BARCODE PRINT COMMAND: [Explanation] "NO." was changed to "No."
	8-87	8.11.2 RESET COMMAND: [Notes] (2) and (3) were deleted.
	9-2	9.2.1 COMMAND SYNTAX ERROR: ③ was added.
	9-6	The following section was added: 9.5 CHARGING ERROR
	9-10	9-11 STATUS VALUES: 'Bluetooth Initialization error' values were corrected in the list.
	9-10, 12	9-11 STATUS VALUES: 'Ir packet error' items were added to the list.
	9-12	9-11 STATUS VALUES: 'Wait for battery recovery' values were corrected in the list.
	9-13	9-11 STATUS VALUES: Description was corrected and note was deleted.
	10-4, 5	10.6.2 MODE SELECT COMMAND: [Explanation] (3) ESC/POS was added. [Notes] (2) Terms were corrected.
	10-8 to 10	10.7.1 PRINT START POSITION FINE ADJUST COMMAND: [Explanation] (5) Descriptions were changed. [Strip position fine adjustment] Figures were changed when the label-to-label gap is 3 mm. Figures were added when the gap is 7 mm. [Notes] Terms were added to (3), (6), (7) and (8) were added.
	10-14	10.8.1 INITIALIZE COMMAND: [Explanation] (3) Descriptions were changed. [Notes] (1) and (2) were added.
	10-26	10.10.4 INTERVAL/WINDOW SETTING AT THE INQUIRY/PAGE: [Explanation] (5) was added.
	11-11, 13, 15, 17, 18	11.11.3 DETAIL STATUS: 11.12 LCD MESSAGES AND LED INDICATIONS: 11.14 LCD MESSAGES IN DIFFERENT LANGUAGES: Ir PACKET ERROR items were added to the lists.
	12-1	The following section was added: 12.2.1 UTF-8 CHARACTER CODE
	12-9 to 12	12.3 TIMES ROMAN, HELVETICA, LETTER GOTHIC, PRESTIGE ELITE, COURIER, GOTHIC725 Black: (15) UTF-8 was added.
12-16	12.4 PRESENTATION: (8) UTF-8 was added.	
12-20	12.5 OCR-A: (8) UTF-8 was added.	
12-24	12.6 OCR-B: (7) UTF-8 was added.	

Date	Modified Pages	Description
May 11, 2009 (Continued)	12-25 to 32	The following sections were added: 12-7 STANDARD CHARACTER (in Japan)/KANJI (16 x 16) (in Japan)/KANJI (24 x 24)(in Japan) 12-8 STANDARD CHARACTER (outside Japan) 12-9 CHINESE CHARACTER (24 x 24) (outside Japan) 12-10 KOREAN CHARACTER (24 x 24) (outside Japan)
	12-33, 34	12.11 BOLD CHARACTER: 12.12 PRICE CHARACTER 1/ PRICE CHARACTER 2 The following items were added: (1) Other than UTF-8 (2) UTF-8
	12-35, 43, 44	12.13 TEC OUTLINE FONT 1: The font type 'K' was added. (3) UTF-8 was added.
	12-45	12.14 PRICE FONT 1, 2, 3: (1) 'All types of character codes' were changed to 'Other than UTF-8.' (2) UTF-8 was added.
	13-1, 14-1, 15-1	13-2 KANJI CODE: 14-2 CHINESE CODE: 15-2 KOREAN CODE: UTF-8-related descriptions were added.
	13-1	The following section was added: 13.3 RESTRICTIONS ON DISCLOSURE OF SPECIFICATIONS
	Contents	In accordance with the changes above, page numbers were changed.
Feb. 6, 2013	3-76 to 79	<ul style="list-style-type: none"> • Illustrations were added for each connection sequence. • 3.8.3.1 INFRASTRUCTURE MODE (ESS) Explanation was modified so that it is consistent with that of 3.8.3.2 ADHOC MODE (IBSS). Explanation about the Radius was corrected. • 3.8.3.2 ADHOC MODE Explanation about IBSS network having same ESSID was added.
	5-41	5.6.2 BIT MAP FONT FORMAT COMMAND (10) Increment/decrement and (11) Zero suppression Font types of 41, 42, 43 and 51 were added as non-supported font types.
	5-208, 6-86, 7-52, 8-96, 10-23	PRINTER SERIAL NUMBER ACQUIRE COMMAND [ESC] WY was added.
	6-59	6.6.1 DATA PRINT COMMAND (16) Description of the specification which is not supported by the B-EP was deleted.
	11-20	11.15 RECOVERY OF BD ADDRESS, supported from firmware V1.2, was added.
	12-1	12.2.1 UTF-8 CHARACTER CODE Explanation of the code table was modified.
	12-30, 32	12.9 CHINESE CHARACTER and 12.10 KOREAN CHARACTER UTF-8 became unsupported.
	Contents	In accordance with the changes above, page numbers were changed.
	Jun. 20, 2013	9-6

Date	Modified Pages	Description
Jun. 20, 2013 (Continued.)	11-11, 11-13, 11-15, 11-17, 11-18	Message, "BT Initializing", has been added.
	11-20	When the old Bluetooth module (V244) is used, an error message, "SYSTEM ERROR 18", is not displayed and a recovery is not performed.
	11-21, 11-22	Section 11.15.1 Recovery of bonding table has been newly added.
Jun. 4, 2014	5-1, 5-2	Explanation of back feed and stop position for firmware V1.0E or later has been added.
	5-3	A supplementary explanation about the back feed in the strip issue for firmware V1.0E or later has been added.
	9-2	9.2.3 LAN DRIVER ERROR has been added.
	11-20	A description that a recovery processing is not performed when the Bluetooth module firmware version is before V257 has been added.
	11-22	Verification of the Bluetooth module version has been added to the flowchart.
Dec. 5, 2014	2-2	New model, B-EP-GH32, has been added.
	2-5, 3-54	Specification of the B-EP-GH32 Bluetooth module has been added.
	3-74	3.7.5 COMBINATION OF BLUETOOTH MODEL AND APPLICABLE FIRMWARE VERSION has been added.
	10-1	Bluetooth (B-EP-GH32) has been added as unusable interface for communication. (10.3 Communications Conditions)
	10-25 to 10-32	Restrictions (specification) concerning the B-EP-GH32 have been added. (Device nickname, Inquiry, Interval, Window, Bonding, Security) Explanation of the conditions when a status 38H/39H (38/39) is sent to the host has been added.
	11-12, 15, 17, 19, 20	An LCD message, "SSP AUTH FAILED," has been added.
	11-22, 23	A note has been added to notify that the B-EP-GH32 does not support the recovery function. A note regarding the B-EP4DL-GH30-FE-QM-R has been added to the BD address recovery.

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1. SCOPE/GENERAL DESCRIPTION

1.1 SCOPE

This specification applies to the software that is used with the “B-EP series” portable printer.

1.2 GENERAL DESCRIPTION

The external equipment interface connects a printer to the host computer through the IrDA, RS-232C, Bluetooth[®], wireless LAN or USB interface for storing forms, or issuing labels or receipts. This specification describes how to use the external equipment interface.

The specification is organized as below. Refer to each chapter according to your needs.

1.2.1 SPECIFICATION ORGANIZATION

- Chapter 1: SCOPE/GENERAL DESCRIPTION
- Chapter 2: OUTLINE OF SPECIFICATIONS
- Chapter 3: INTERFACE
- Chapter 4: TRANSMISSION SEQUENCE
- Chapter 5: TPCL MODE (INTERFACE COMMANDS)
- Chapter 6: LABEL MODE (INTERFACE COMMANDS)
- Chapter 7: RECEIPT MODE (INTERFACE COMMANDS)
- Chapter 8: ESC/POS MODE (INTERFACE COMMANDS)
- Chapter 9: ERROR PROCESSING
- Chapter 10: SYSTEM MODE
- Chapter 11: OTHER FUNCTIONS
- Chapter 12: CHARACTER CODE TABLE
- Chapter 13: KANJI CODE TABLE
- Chapter 14: CHINESE CODE TABLE
- Chapter 15: KOREAN CODE TABLE
- Chapter 16: BARCODE/TWO-DIMENSIONAL CODE TABLE

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2. OUTLINE OF SPECIFICATIONS

2.1 GENERAL DESCRIPTION

This chapter describes the outline of specifications – modes, which the printer has. For more details, refer to the appropriate chapter.

■ [TPCL (TEC Printer Command Language) mode]

The printer draws data according to the format information and print data sent from the host, and issues labels according to the Issue Command.

■ [LABEL mode]

The label format information, graphic data, or writable character data sent from the host, is previously stored in flash ROM as an initial setting. The printer links the print data sent through its interface to the format data or writable character data in flash ROM, then draws and issues.

■ [RECEIPT mode]

The printer draws and issues according to the data or commands sent from the host.

■ [ESC/POS mode]

The printer draws and issues according to the data or commands sent from the host.

■ [SYSTEM mode]

In this mode, self-test printing, slant line printing and settings/changing of internal parameters are performed.

2.2 DIMENSION

B-EP2DL	88.0 (W) x 119.0 (L) x 65.0 (D)
B-EP4DL	150.0 (W) x 145.0 (L) x 75.0 (D)

* Excluding the projecting parts.

2.3 WEIGHT

B-EP2DL	
B-EP2DL-GH20-QM-R	Approx. 475 g
B-EP2DL-GH30-QM-R	Approx. 480 g
B-EP2DL-GH40-QM-R	Approx. 480 g
B-EP2DL-GH32-QM-R	Approx. 480 g
B-EP4DL	
B-EP4DL-GH20-QM-R	Approx. 855 g
B-EP4DL-GH30-QM-R	Approx. 860 g
B-EP4DL-GH40-QM-R	Approx. 865 g
B-EP4DL-GH32-QM-R	Approx. 860 g

* Including a battery, excluding paper

2.4 PRINTING METHOD

Direct thermal

2.5 HEAD SPECIFICATION

B-EP2DL	8 dots/mm
B-EP4DL	8 dots/mm

2.6 PRINT SPEED

Approx. 12.5 mm/sec to Approx. 105 mm/sec
(at 25°C when using the battery designated and paper recommended by Toshiba TEC)

2.7 PRINT MODE

- LABEL mode
- RECEIPT mode
- TPCL mode
- ESC/POS mode

* ESC/POS™ is a registered trademark of Seiko Epson Corporation.

2.8 FONT TYPE

2.8.1 BIT MAP FONT

Standard character/Characters under bars	12 × 24 dots (alphanumeric, Kana, symbol)
Bold character	48 × 96 dots (numeric, symbol, space)
Price Font 1	16 × 40 dots (numeric, symbol, space)
Price Font 2	32 × 48 dots (numeric, symbol, space)
Times Roman (Medium)	12 point
Times Roman (Medium)	15 point
Times Roman (Bold)	15 point
Times Roman (Bold)	18 point
Times Roman (Bold)	21 point
Times Roman (Italic)	18 point
Helvetica (Medium)	9 point
Helvetica (Medium)	15 point
Helvetica (Medium)	18 point
Helvetica (Bold)	18 point
Helvetica (Bold)	21 point
Helvetica (Italic)	18 point
Presentation (Bold)	27 point
Letter Gothic (Medium)	14.3 point
Prestige Elite (Medium)	10.5 point
Prestige Elite (Bold)	15 point
Courier (Medium)	15 point
Courier (Bold)	18 point
OCR-A	12 point
OCR-B	12 point
GOTHIC725 Black	6 point
Kanji/writable character (Gothic type)	16 × 16 dots ^{*1}
Kanji/writable character (Gothic type)	24 × 24 dots ^{*1}
Kanji/writable character (Ming type)	32 × 32 dots ^{*1}
Chinese	24 × 24 dots
Korean	24 × 24 dots ^{*1}

* Some fonts cannot be printed depending on the print mode.

*1 These fonts are downloaded in the DBCS (Double Byte Character Set) area to be supported.

The Kanji character is supported in Japan only.

The Korean character is supported in Republic of Korea only.

2.8.2 OUTLINE FONT

- TEC Font 1 (Not proportional)
- TEC Font 1 (Proportional)
- Price Font 1, 2, 3 (Outline)

* Not only normal but also italic fonts are supported.

2.9 TYPE OF BARCODE/TWO-DIMENSIONAL CODE

2.9.1 BARCODE

- JAN8/EAN8
- JAN13/EAN13
- UPC-A
- UPC-E
- Interleaved 2 of 5 (ITF)
- CODEBAR (NW-7)
- CODE39
- CODE93
- CODE128/EAN128
- MSI
- Industrial 2 of 5
- MATRIX 2 of 5 for NEC
- GS1 Databar
(Omnidirectional/Stacked/Stacked/Omnidirectional/Limited/Expanded/Expanded Stacked)
- Customer barcode
- POSTNET
- RM4SCC
- KIX CODE

* Some barcodes cannot be printed depending on the print mode.

2.9.2 TWO-DIMENSIONAL CODE

- QR code
- PDF417
- Data Matrix
- MaxiCode
- MicroPDF417

* Some two-dimensional codes cannot be printed depending on the print mode.

2.10 FORMAT STORAGE

LABEL mode.....Max. 20 types

TPCL mode.....Max. 99 types

2.11 GRAPHIC STORAGE

Two graphic data can be stored (in the LABEL or RECEIPT mode).

2.12 WRITABLE CHARACTER STORAGE

LABEL mode.....24 x 24 dots: 50 characters
 TPCL mode.....Free size: 224 characters x 40 types
 16 x 16 dots: 188 characters
 24 x 24 dots: 188 characters
 32 x 32 dots: 188 characters

2.13 INTERFACE

- IrDA V1.2 (IrCOMM, IrOBEX, TEC Protocol)
- RS-232C
- Bluetooth V1.2 (Class 2)
 V2.1 + EDR (class 2)
- Wireless LAN (802.11b/g)
- USB V2.0

2.14 POWER SOURCE

Type: Lithium-ion battery

Voltage:

	B-EP2DL	B-EP4DL
Voltage	7.4 V 2600 mAh	14.8 V 2600 mAh

Charging method: Charge only the battery using the battery charger.

2.15 SWITCH

POWER switch
 FEED switch
 PAUSE switch

2.16 SENSOR

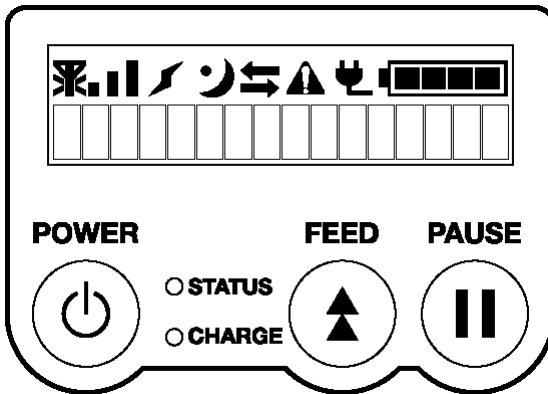
Cover open sensor
 Transmissive sensor
 Reflective sensor
 Strip issue path detection sensor
 Head temperature sensor (-15 °C to 70 °C)
 Ambient temperature sensor (-15 °C to 70 °C)
 Strip wait label detection sensor

2.17 LED

Red
 Orange
 Green

2.18 LCD

Mark + (5 x 7 dots) x 16 characters



2.19 SPEAKER

On-board beeper
Volume adjustment function

2.20 ISSUE MODE

Strip issue (with label present sensor)
Batch issue

2.21 PAPER

	B-EP2DL	B-EP4DL
Label width	13 to 55 mm	47 to 112 mm
Label-to-label gap	3 to 7 mm	3 to 7 mm
Black mark length	3 to 7 mm	3 to 7 mm
Backing paper width	16 to 58 mm	50 to 115 mm
Receipt paper width	16 to 58 mm	50 to 115 mm

2.22 CUT

Manual cut using the tear bar

2.23 BROKEN HEAD DOTS CHECK FUNCTION

When the printer is turned ON, or the cover is closed, the program will check for broken head dots according to the setting. If broken head dots are detected, a broken head dot error will occur. Printing can be still performed according to the setting, even after a broken head dot error occurred.

2.24 STATUS TRANSMISSION

The printer sends a status when:

- The host requests status transmission.
- The printer receives a command, while it is in an error state.
- Automatic status transmission in the Issue Command has already been designated.

2.25 AUTO LABEL POSITIONING FUNCTION

When the cover is closed after replacing the label paper according to the setting, the label is automatically fed to the first print position.

However, when the RECEIPT mode or ESC/POS mode is selected or no sensor is designated, a first print position feed is not performed.

2.26 STATUS PRINTING

Pressing the POWER key while holding down the FEED key allows the printer (for service technicians and system administrators) to enter the SYSTEM mode.

Pressing the POWER key while holding down the PAUSE key allows the printer (for general users) to enter the SYSTEM mode.

When a menu is selected, the result of the printer's state will be printed.

2.27 CONTINUOUS PRINTING FUNCTION

When the RECEIPT mode (Mode = 2), TPCL mode (Mode = A), TPCL mode (Mode = B) or ESC/POS mode (Mode = 4) is selected, after an error state (label end, cover open error, or a paper jam) is cleared, the printer automatically continues printing the received data. After paper is replaced, the error is cleared by closing the cover. Then, the printer automatically continues printing. When the cover is closed, if the printer has run out of the paper, the printer neither clears the error nor continues printing. It remains in the error state.

2.28 STRIP ISSUE

When the LABEL mode (mode = 0), TPCL mode (mode =A) or TPCL1 mode (mode = B) is selected, the specified number of labels are printed. Note that a next print job is not performed until the printed label is removed from the strip shaft.

3. INTERFACE

3.1 GENERAL DESCRIPTION

This chapter describes details regarding the interfaces between the host and the printer. The printer configurations are as follows:

- IrDA + USB + RS-232C model
- IrDA + USB + Bluetooth model
- IrDA + USB + Wireless LAN model

The interfaces between Bluetooth and wireless LAN can be optionally upgraded:

- RS-232C → Bluetooth
- RS-232C or Bluetooth → Wireless LAN
- RS-232C → RS-232C + Bluetooth
- RS-232C → RS-232C + Wireless LAN
- Bluetooth → Wireless LAN

IrDA supports the following three protocols. Each of them is independently described on later pages.

- TEC Protocol
- IrCOMM (9-WIRE)
- IrOBEX

The printer interface is automatically switched between IrDA and RS-232C/Bluetooth/wireless LAN on the following conditions:

- IrDA + USB + RS-232C model

When the RS-232C cable is connected to the printer, the printer interface will be switched to the RS-232C interface. When the RS-232C cable is disconnected, the interface will be switched to IrDA.

- IrDA + USB + Bluetooth model or IrDA + USB + Wireless LAN model

Usually, IrDA interface is standing by for communications. When data is sent from Bluetooth interface or wireless LAN interface, the printer interface is automatically switched to the appropriate interface.

When the printer enters the power save mode after the termination of a communication by Bluetooth or wireless LAN interface (when five minutes have passed after the termination), the printer interface will return to IrDA.

If data is sent to the printer by Bluetooth or wireless LAN interface during the communication by IrDA, the printer interface will be automatically switched to Bluetooth or wireless LAN, and consequently the communication by IrDA cannot be made successfully.

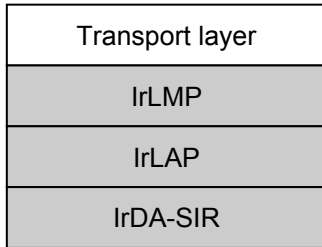
Notes

When the RS-232C is used for communications, the RS-232C cable must be connected to the printer before the power is turned on.

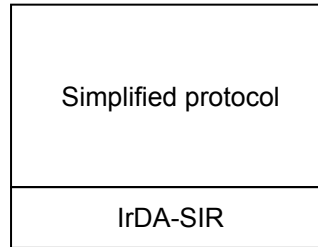
3.2 IrDA INTERFACE (TEC Protocol)

In IrDA standard, only IrDA-SIR of the physical layer should be used. For the data link layer, original simplified protocol should be provided.


3.2.1 SPECIFICATIONS FOR PHYSICAL LAYER AND TRANSMISSION CONTROL METHOD



IrDA V1.2 (Low Power) standard



B-EP

 parts are required.

(1) Specifications

Item	Specifications
	Normal mode
Physical layer	Conforming to IrDA-SIR V1.2 (Low Power) standard
Transfer rate	9600, 19200, 38400, 57600, 115200 bps ^{*1}
Communication distance	within 0.2 m ^{*2}
Peak wave length of emitted light	850 to 900 nm
Communicable angle	within $\pm 15^\circ$
Ambient illuminance	1000 lx or less (fluorescent lamp and incandescent lamp)
Emissive power	Min 3.6 mW/Sr ($\theta_h, \theta_v \leq \pm 15^\circ$)
Min. photo sensibility	Min 9 $\mu\text{W}/\text{cm}^2$ ($\theta_h, \theta_v \leq \pm 15^\circ$)

*1: Values for the normal mode are dependent on the communication protocol settings.

*2: The communication distance may become shorter than 0.2 m, depending on the host's performance.

3.2.2 INPUT/OUTPUT SIGNAL

- RD (Host → Printer)

A data signal which the printer receives from the host.
Logic 1 is Low level, while logic 0 is High level.
It is in a Low state when no transmission is in progress.

- SD (Printer → Host)

A data signal which the printer sends to the host.
Logic 1 is Low level, while logic 0 is High level.
It is in a Low state when no transmission is in progress.

3.2.3 TRANSMISSION CONTROL

The host performs transmission control with a NAK (15H)/ACK (06H), which means the printer is ready, a link request PAD (FFH), and a command packet.

① Link request (Host → Printer)

The host should send a link request PAD (FFH) in order to link to the printer. The link request PAD should be intermittently sent until the printer is linked and enters a ready state.

② Printer ready (Printer → Host)

When the printer detects the link request PAD from the host and enters a ready state for receiving the command packet, the printer sends a NAK within 40 msec. When an error such as CRC occurs, the printer sends a NAK.

NAK
15H

The printer sends an ACK, when the printer properly receives the command packet and enters a ready state for receiving the next data, or when the data is stored into flash ROM.

ACK
06H

③ End of link (Host → Printer)

When there is no packet to be sent, the host sends an EOT to end the link.

EOT
04H

④ Turnaround time

The printer should send a NAK/ACK/status packet after 5 msec. from when a PAD/command packet has been received.

⑤ Time out

Host: Time out due to waiting for a NAK after a PAD is sent..... 50 msec.
Time out due to waiting for an ACK after a command is sent 200 msec.
Printer: Time out due to waiting for a command after a NAK is sent 1 sec.
Time out due to waiting for an EOT or a command after an ACK is sent ... 1 sec.
Time out due to waiting for an EOT after the status is sent 1 sec.

⑥ Status packet (Printer → Host)

If the printer enters an error state when the command is sent from the host, or when status transmission is requested, the printer sends a status.

NOTE: The data error is checked by CRC. However, noise included in sent/received data may cause misprinting. (Though CRC check is carried out in 16 bits, there is a possibility that the data including noise matches 16 bits of CRC check.)

[LABEL, RECEIPT or ESC/POS mode]

Data to be sent

STX	Printer ID		Version No. of each form				Printer status	Battery status	CRC	
02H	xxH	xxH	V01	V02	V20	xxH	xxH	xxH	xxH

Range of CRC calculation

- Printer ID 2-byte hex data (in order from High to Low)
- Version No. of each form (00H to 09H)
 - V01 Version of form No. 1 (1-byte hex data)
 - V02 Version of form No. 2 (1-byte hex data)
 -
 - V20 Version of form No. 20 (1-byte hex data)
- Printer status... Printer status is indicated in 1-byte data.
 - 00H: Normal state (idling)
 - 01H: Cover open state
 - 02H: Command syntax error (including Ir packet error)
 - 03H: Paper jam
 - 04H: Label end
 - 05H: Cover open error
 - 06H: Broken head dots error
 - 07H: Thermal head excessive temperature
 - 08H: Flash ROM write error
 - 09H: Flash ROM erase error
 - 0AH: Low battery (Print failure)
 - 0BH: Operating
 - 0CH: Communication error * In the RECEIPT mode or for RS-232C connection only
 - 0DH: Normal end + Label end
 - 0EH: Flash ROM storage area full state
 - 0FH: Wait for strip * In the LABEL mode only
 - 10H: Normal issue end
 - 14H: Pause state
 - 19H: Ambient temperature error
 - 32H: Abnormal battery temperature
 - 33H: Battery excessive temperature
 - 37H: Charging error
 - (38H: Bluetooth setting successfully completed)
 - Response status for automatic status transmission
 - 39H: Bluetooth setup error (including initialization error)
 - 45H: Wait for battery recovery
 - 46H: Wait for head temperature reduction
 - 47H: Wait for motor temperature reduction
 - 55H: Writable character/PC command save mode

NOTE: 0DH (Normal issue end + Label end) is a state when the printer runs out of labels, after a label is issued.

- Status in the compatible mode for the B-SP series
 - 00H: Normal state (idling)
 - 01H: Cover open state
 - 02H: Command syntax error (including Ir packet error)
 - 03H: Paper jam
 - 04H: Label end
 - 05H: Cover open error
 - 06H: Broken head dots error
 - 07H: Thermal head excessive temperature (including ambient temperature error, abnormal battery temperature, and battery excessive temperature)
 - 08H: Flash ROM write error
 - 09H: Flash ROM erase error
 - 0AH: Low battery (Print failure)
 - 0BH: Operating (including wait for strip, pause state, writable character/PC command save mode, wait for battery recovery, wait for head temperature reduction, and wait for motor temperature reduction)
 - 0CH: Communication error * In the RECEIPT mode or for RS-232C connection only
 - 0DH: Normal end + Label end
 - 0EH: Flash ROM storage area full state
 - 10H: Normal issue end
 - 37H: Charging error
 - (38H: Bluetooth setting successfully completed)
Response status for automatic status transmission
 - 39H: Bluetooth setup error (including initialization error)
 - Battery status .. The battery charge status is indicated in 5 levels.
 - (B-EP2DL)
 - 01H: 7.2 V or less (Print failure)
 - 02H: 7.3 V to 7.4 V (remaining No. of printable labels: Approx. 1 to 30)
 - 03H: 7.5 V to 7.7 V (remaining No. of printable labels: Approx. 30 to 150)
 - 04H: 7.8 V to 7.9 V (remaining No. of printable labels: Approx. 150 to 300)
 - 05H: 8.0 V to 8.4 V (remaining No. of printable labels: Approx. 300 or more)
 - (B-EP4DL)
 - 01H: 14.0 V or less (Print failure)
 - 02H: 14.1 V to 14.6 V (remaining No. of printable labels: Approx. 1 to 30)
 - 03H: 14.7 V to 15.2 V (remaining No. of printable labels: Approx. 30 to 150)
 - 04H: 15.3 V to 15.9 V (remaining No. of printable labels: Approx. 150 to 300)
 - 05H: 16.0 V to 16.8 V (remaining No. of printable labels: Approx. 300 or more)
- NOTE:** *The remaining number of printable labels may vary according to the contents to be printed and the ambient environment.*
- CRC 2-byte hex data (in order from Low to High)

[TPCL mode]

Data to be sent

STX	Printer ID		Status			Remaining No. of labels				CRC	
02H	xxH	xxH	3xH	3xH	3xH	3xH	3xH	3xH	3xH	xxH	xxH

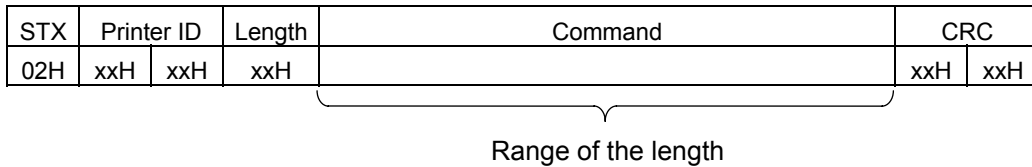
Range of CRC calculation

- Printer ID 2-byte hex data (in order from High to Low)
- Status Detailed status is indicated in 2-byte data.
 - “00”: Normal state
 - “01”: Cover open state
 - “02”: Operating
 - “04”: Pause state
 - “05”: Wait for strip
 - “06”: Command syntax error (including Ir packet error)
 - “09”: Normal issue end + Label end
 - “11”: Paper jam
 - “13”: Label end
 - “15”: Cover open error
 - “17”: Broken head dots error
 - “18”: Thermal head excessive temperature
 - “19”: Ambient temperature error
 - “32”: Abnormal battery temperature
 - “33”: Battery excessive temperature
 - “36”: Low battery
 - “37”: Charging error
 - (“38”: Bluetooth setting successfully completed) Response status for automatic status transmission
 - “39”: Bluetooth setup error (including initialization error)
 - (“40”: Normal issue end) Response status for automatic status transmission
 - (“41”: Normal feed end) Response status for automatic status transmission
 - “45”: Wait for battery recovery
 - “46”: Wait for head temperature reduction
 - “47”: Wait for motor temperature reduction
 - “50”: Flash ROM write error
 - “51”: Flash ROM erase error
 - “54”: Flash ROM storage area full state
 - “55”: Writable character/PC command save mode

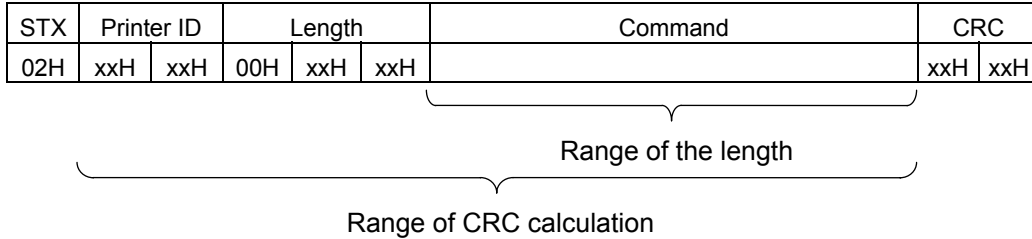
- Detailed status in the compatible mode for the B-SP series
 - “00”: Normal state
 - “01”: Cover open state
 - “02”: Operating (including wait for strip, pause state, wait for battery recovery, wait for head temperature reduction, wait for motor temperature reduction, and writable character/PC command save mode)
 - “06”: Command syntax error (including Ir packet error)
 - “09”: Normal issue end + Label end
 - “11”: Paper jam
 - “13”: Label end
 - “15”: Cover open error
 - “17”: Broken head dots error
 - “18”: Thermal head excessive temperature (including ambient temperature error, battery abnormal temperature, and battery excessive temperature)
 - “36”: Low battery
 - “37”: Charging error
 - (“38”: Bluetooth setting successfully completed) Response status for automatic status transmission
 - “39”: Bluetooth setup error (including initialization error)
 - (“40”: Normal issue end) Response status for automatic status transmission
 - (“41”: Normal feed end) Response status for automatic status transmission
 - “50”: Flash ROM write error
 - “51”: Flash ROM erase error
 - “54”: Flash ROM storage area full state
- Status type Indicated in 1-byte data
 - “1”: Status Request Command
 - “2”: Automatic status transmission
- Remaining No. of labels.... Indicated in 4-byte data
 - “0000” to “9999”
- CRC 2-byte hex data (in order from Low to High)

⑦ Command packet in the LABEL mode (Host → Printer)

Length is designated in 1 byte:



Length is designated in 2 bytes:



- Printer ID 2-byte hex data (in order from High to Low)
 - Length Hex data indicating the number of bytes of command data
 - When the length is designated in 1 byte: 1 byte
01H to FFH
 - When the length is designated in 2 bytes: 3 bytes
The first 1 byte is fixed at 00H.
Designate the length using the remaining 2 bytes.
(in order from Low to High): 0001 H to 0FFFH
 - CRC 2-byte hex data (in order from Low to High)
- * Between the start and the termination of storing the form, a packet including several commands can be sent. However, the command data should not be included in two packets. For other commands, one packet should include only one command.
- * For all commands except the Graphic Data Store Command, data included in several packets should not be sent. The Data Print Command can also send data included in several packets if it is sent using the format on the next page.

* Multiple packet format for including the Data Print Command in several packets
(Host → Printer)

Length is designated in 1 byte:

STX	Printer ID		Length	Mode	Flag	Command & Data		CRC	
02H	xxH	xxH	xxH	Y	xxH			xxH	xxH

Range of the length

Length is designated in 2 bytes:

STX	Printer ID		Length			Mode	Flag	Command & Data		CRC	
02H	xxH	xxH	00H	xxH	xxH	Y	xxH			xxH	xxH

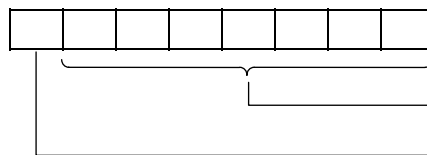
Range of the length

Range of CRC calculation

- Printer ID 2-byte hex data (in order from High to Low)
- Length Hex data indicating the number of bytes of command data
 - When the length is designated in 1 byte: 1 byte
01H to FFH
 - When the length is designated in 2 bytes: 3 bytes
The first 1 byte is fixed at 00H.
Designate the length using the remaining 2 bytes.
(in order from Low to High): 0001 H to 0FFFH

NOTE: Up to 4 KB per one packet can be sent. However, total data amount from the first block to the final block must be 60 KB or less.

- Mode Fixed at "Y"
- Flag Flag indicating the block No. or the final block flag for the receipt issue (1 byte)

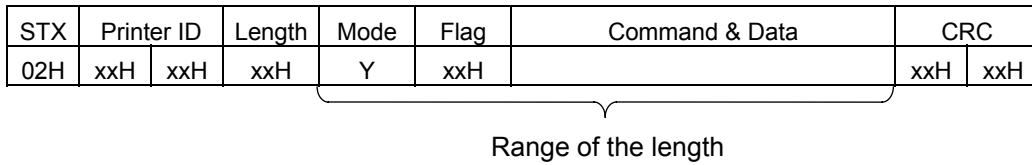


Final block flag 0: Final
1: Not final

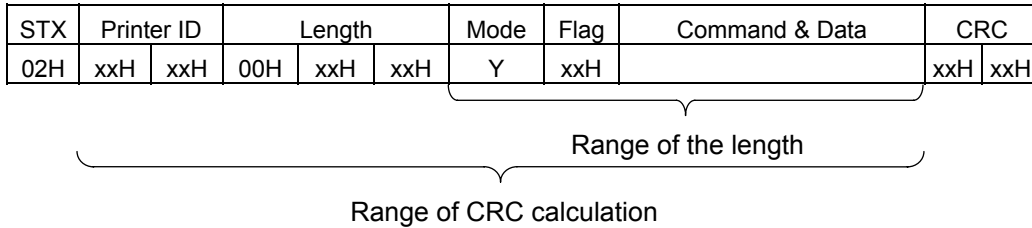
- CRC 2-byte hex data (in order from Low to High)

⑧ Command packet in the TPCL, RECEIPT or ESC/POS mode (Host → Printer)

Length is designated in 1 byte:



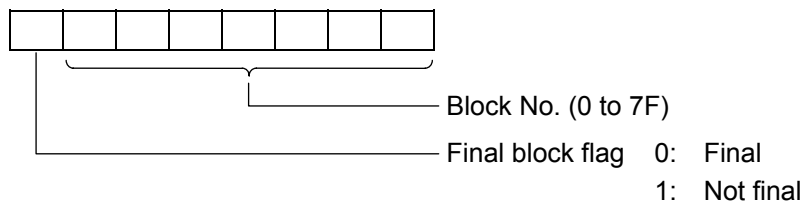
Length is designated in 2 bytes:



- Printer ID 2-byte hex data (in order from High to Low)
- Length Hex data indicating the number of bytes of command data
 - When the length is designated in 1 byte: 1 byte
01H to FFH
 - When the length is designated in 2 bytes: 3 bytes
The first 1 byte is fixed at 00H.
Designate the length using the remaining 2 bytes.
(in order from Low to High): 0001 H to 0FFFH

NOTE: Up to 4 KB per one packet can be sent. However, total data amount from the first block to the final block must be 60 KB or less.

- Mode Fixed at "Y" (indicating the RECEIPT mode)
- Flag Flag indicating the block No. or the final block flag for the receipt issue (1 byte)



- CRC 2-byte hex data (in order from Low to High)

* For the Status Request Command, the Mode Select Command, Reset Command, Receive Buffer Remaining Capacity Request Command, and Printer Option Retrieve Command, one packet should include only one command.

⑨ Turnaround time

The printer should send a NAK/ACK/status packet after 5 msec. from when a PAD/command packet has been received.

3.2.4 HOW TO SEND THE DATA PRINT COMMAND WHICH CANNOT BE INCLUDED IN ONE PACKET IN THE LABEL MODE

When the Data Print Command in the LABEL mode cannot be included in one packet (256 bytes or more in 1-byte length designation, 4096 bytes or more in 2-byte length designation), it can be included in several packets by using the multiple packet format for the Data Print Command, described on page 3-7.

Conditions: Data length for the Bit Map Font Field Command, the Outline Font Field Command, and the Barcode/Two-dimensional Code Format Command, should be fixed at "00".
For the JIS 8 and Shift JIS Kanji codes only.

(Example) To include the Data Print Command below into several packets:

```
X [01H] [01H] [01]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
```

Command packet 1

```
[STX] [00H] [00H] [DEH] Y [80H] X [01H] [01H] [01H]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
[CRC] [CRC]
```

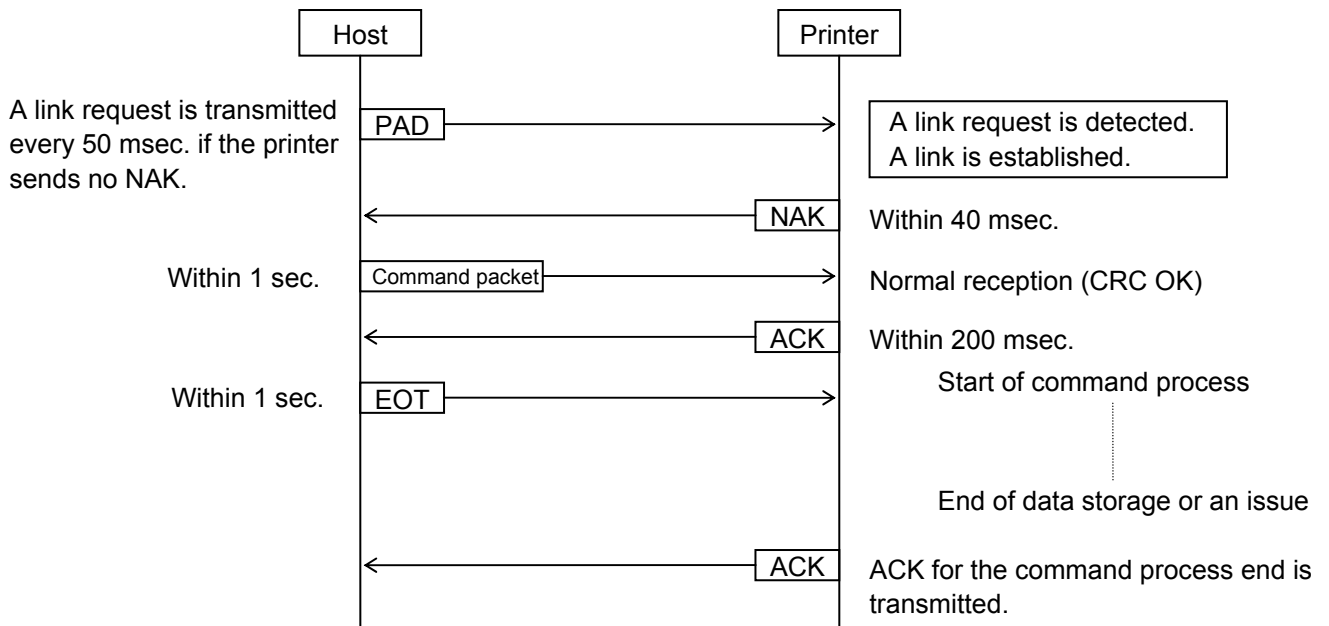
Command packet 2

```
[STX] [00H] [00H] [DAH] Y [01H]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF] ABCDEF GHIJKLMNOPQRSTUVWXYZ [LF]
[CRC] [CRC]
```

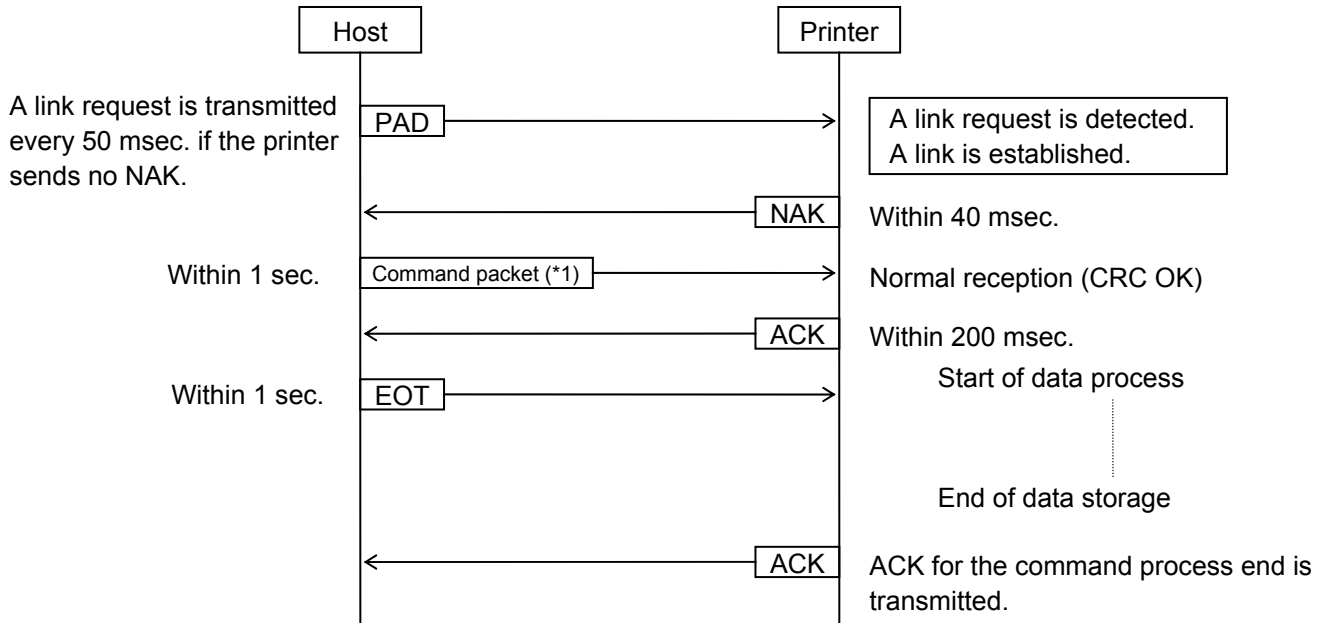
3.2.5 CONNECTION SEQUENCE EXAMPLE (LABEL MODE)

< Normal transmission >

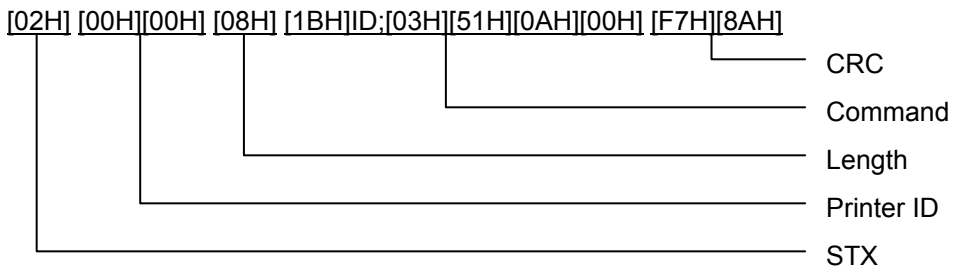
- When one packet is sent.



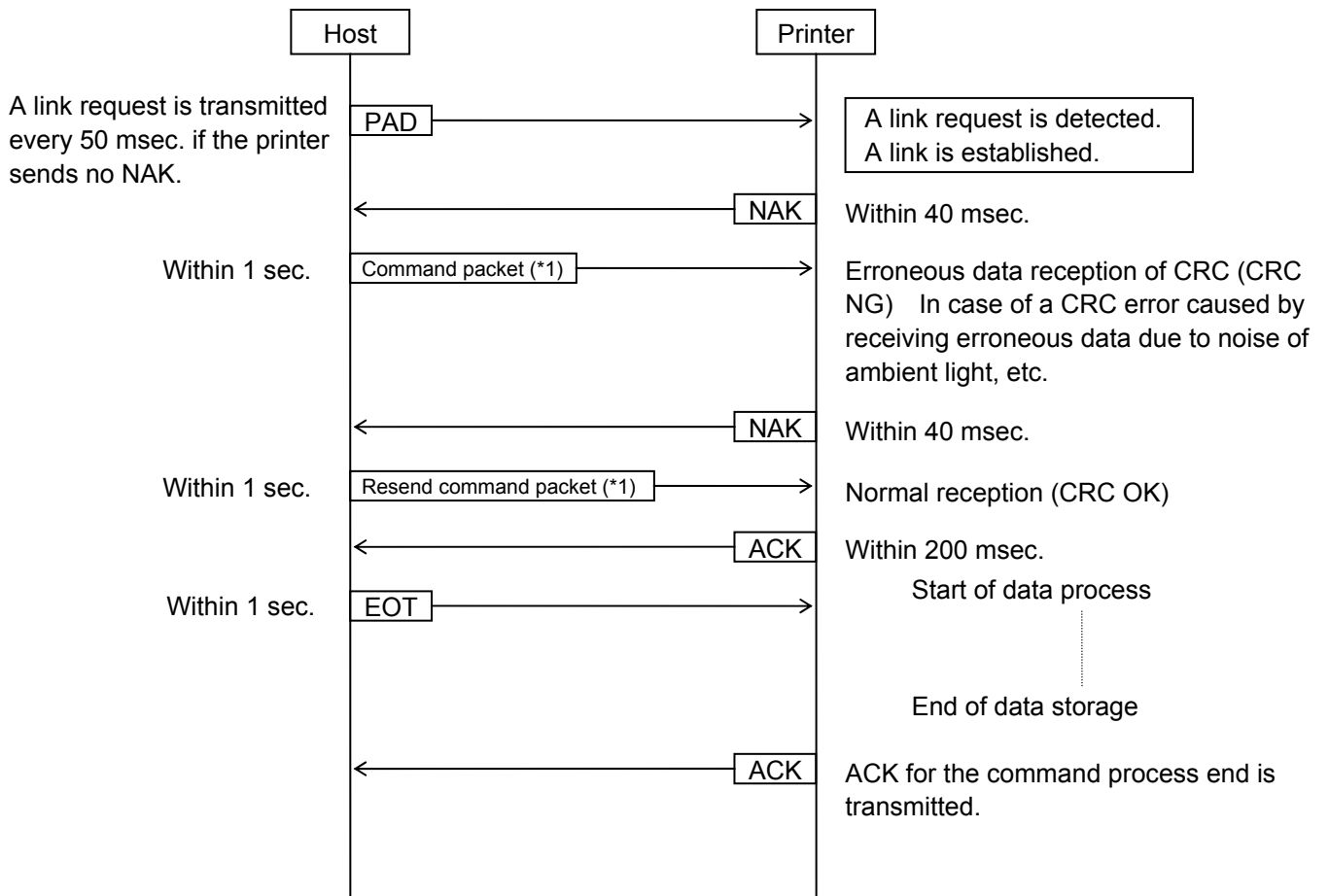
• ID set command (normal transmission)



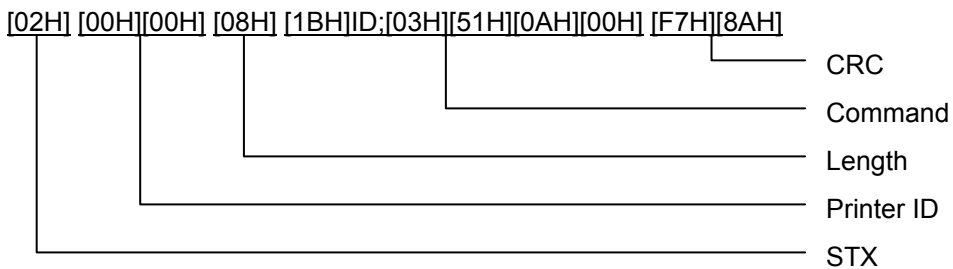
*1: Explanation of a command packet (when the length is designated in 1 byte.)
To send [ESC] ID; [03H] [51H] [LF] [NUL].



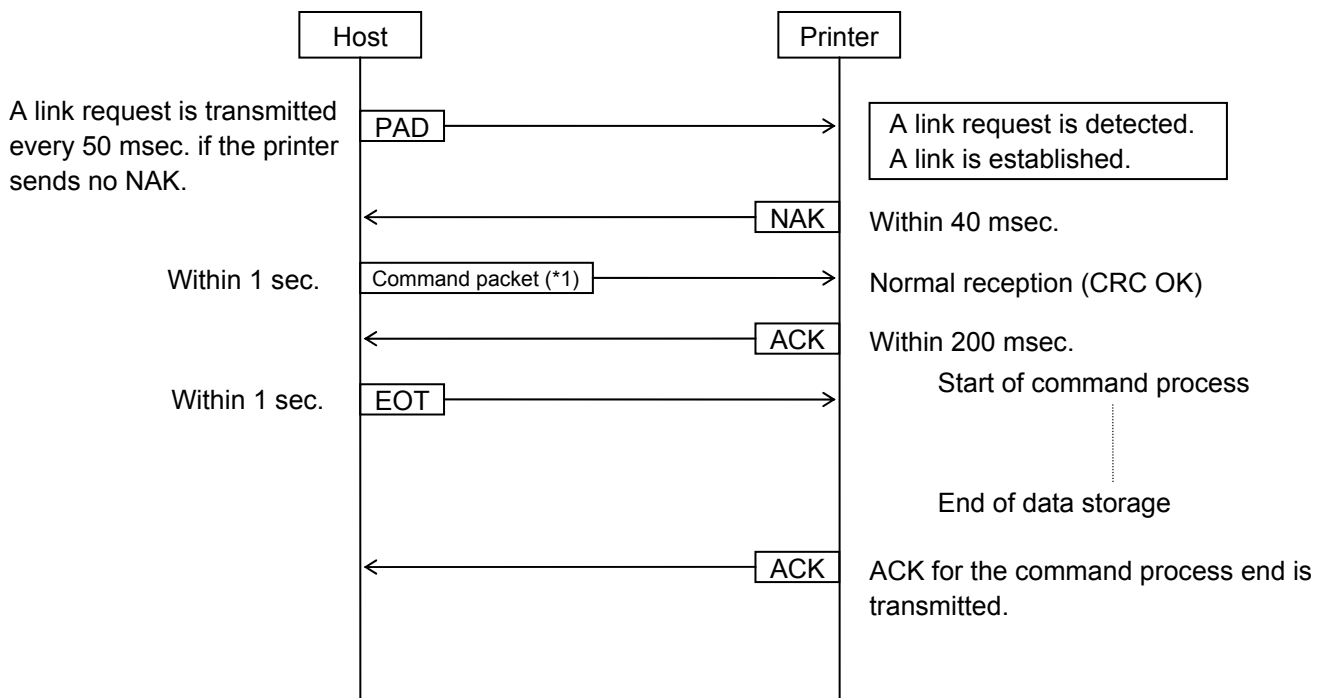
- ID set command (erroneous transmission)



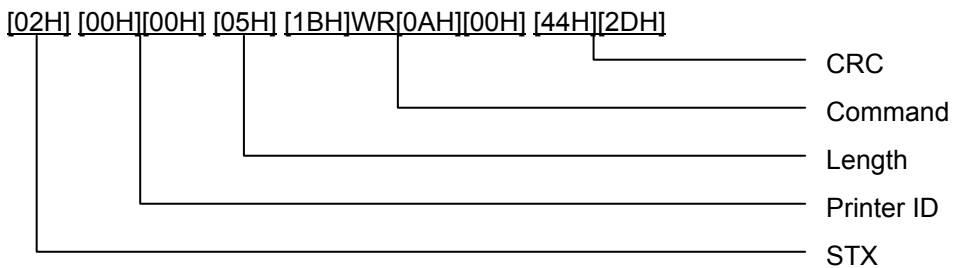
*1: Explanation of a command packet (when the length is designated in 1 byte.)
To send [ESC] ID; [03H] [51H] [LF] [NUL].



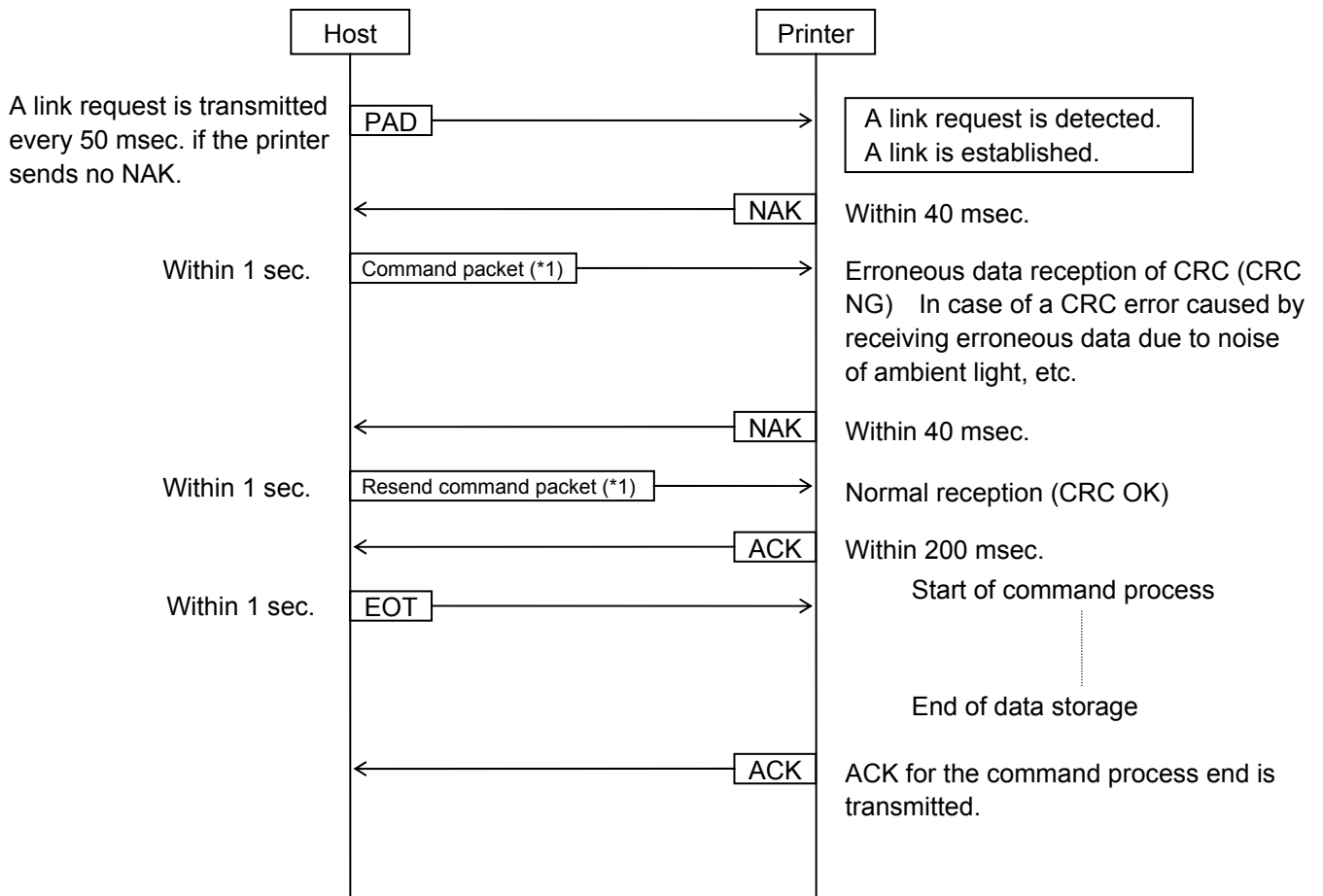
- Initialize command (normal transmission)



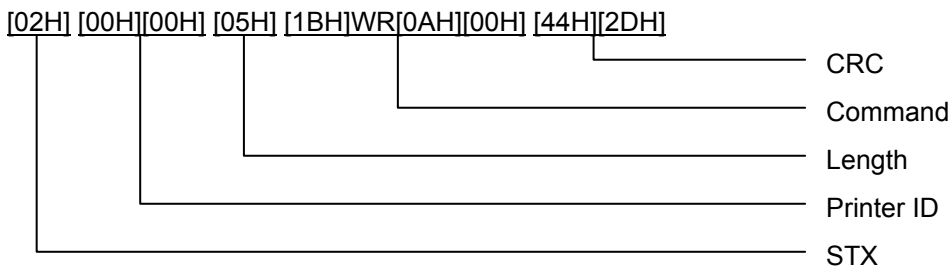
- *1: Explanation of a command packet (when the length is designated in 1 byte.)
To send [ESC] WR [LF] [NUL].



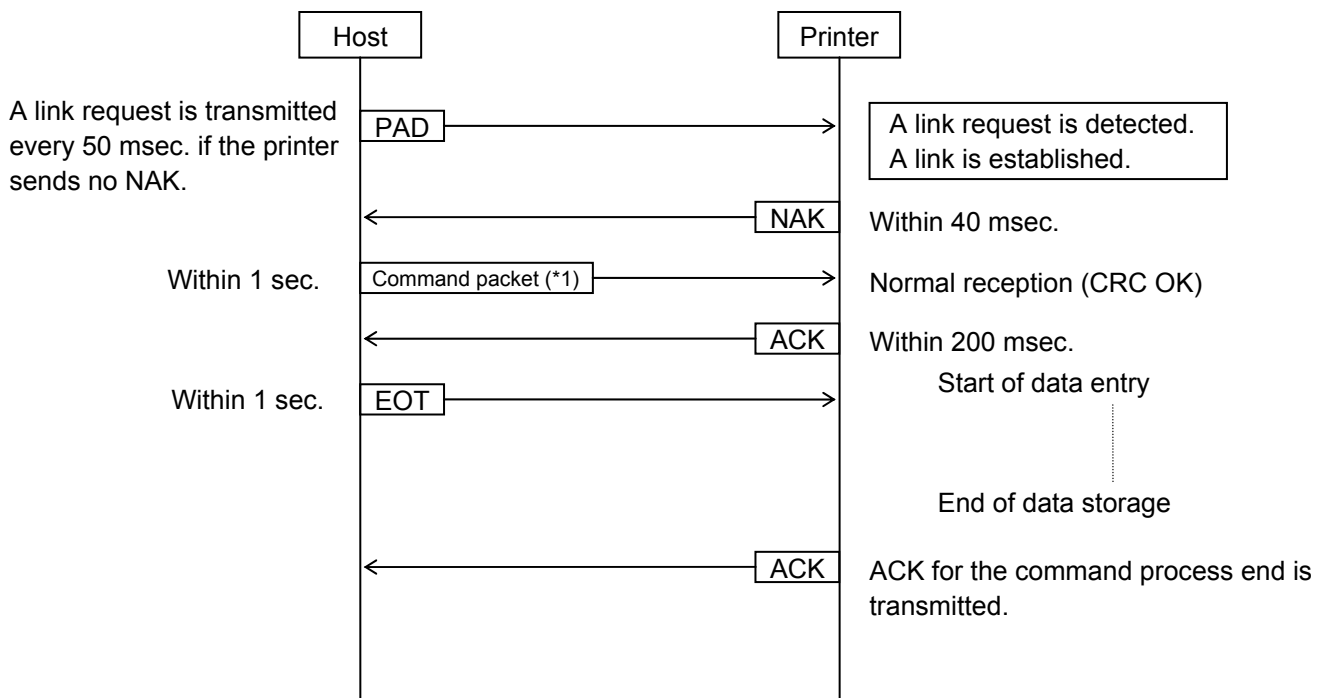
- Initialize command (erroneous transmission)



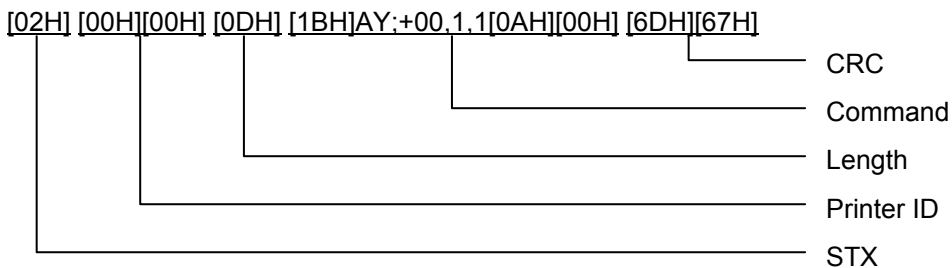
*1: Explanation of a command packet (when the length is designated in 1 byte.)
To send [ESC] WR [LF] [NUL].



- Print density fine adjust command (normal transmission)



- *1: Explanation of a command packet (when the length is designated in 1 byte.)
To send [ESC] AY; +00, 1, 1 [LF] [NUL].



The above sequence is also applied to the print position fine adjust command and the strip sensor adjust command.

Explanation of each command packet (when the length is designated in 1 byte) is shown below.

Print position fine adjust command

To send [ESC] AX; +000 [LF] [NUL].

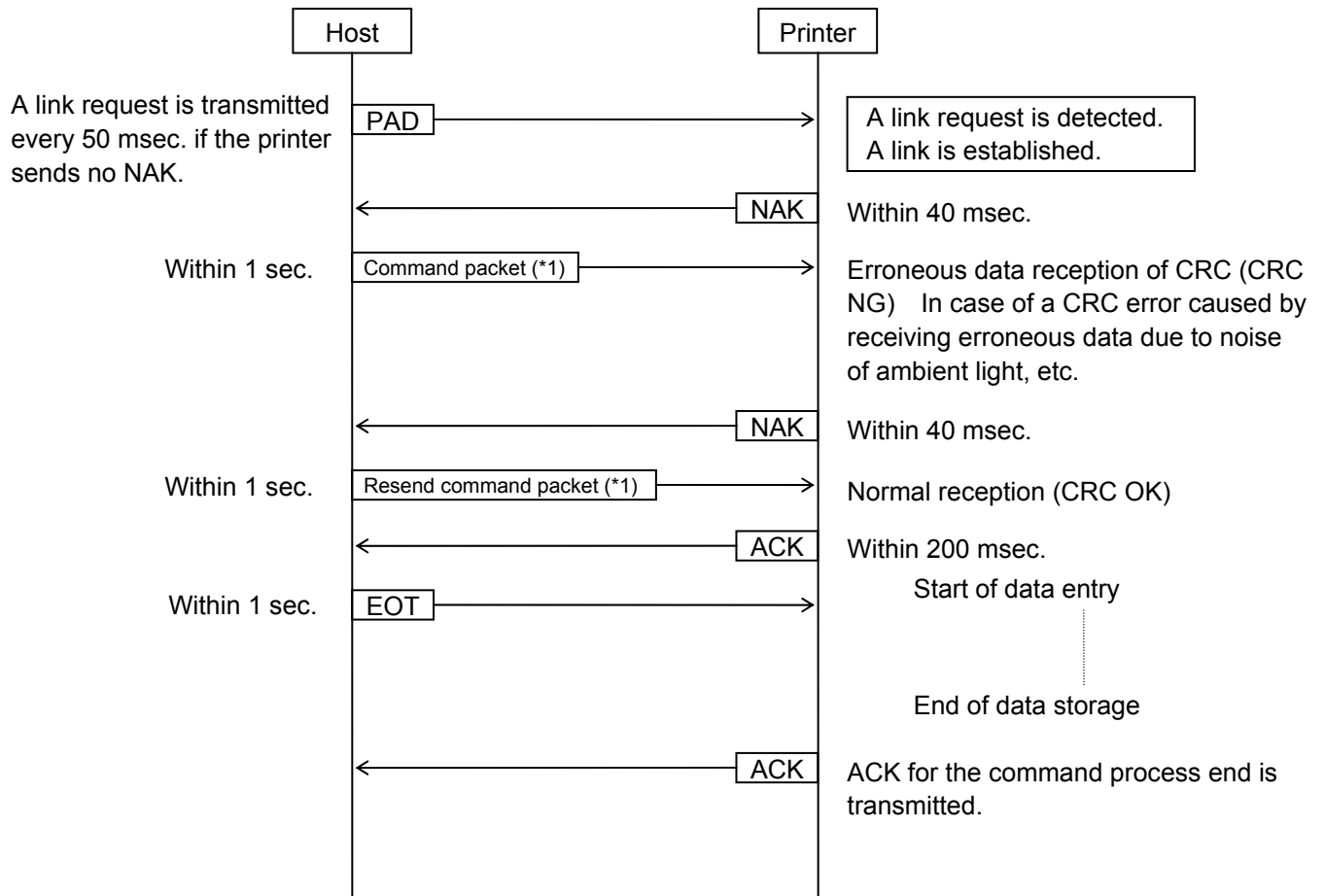
[02H] [00H] [00H] [0DH] [1BH] AX; 000 [0AH] [00H] [AAH] [44H]

Strip sensor adjust command

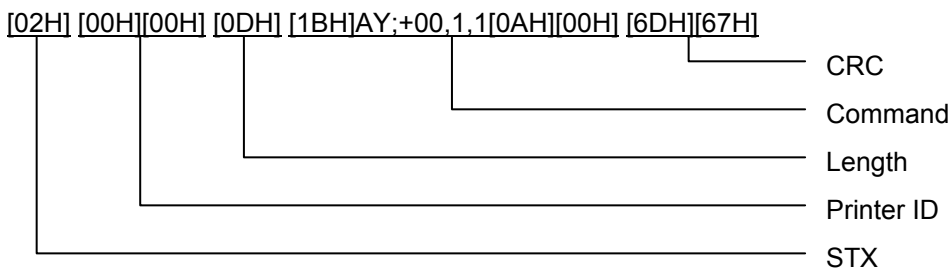
To send [ESC] AZ; 0 [LF] [NUL].

[02H] [00H] [00H] [0DH] [1BH] AZ; 0 [0AH] [00H] [34H] [F4H]

- Print density fine adjust command (erroneous transmission)



*1: Explanation of a command packet (when the length is designated in 1 byte.)
To send [ESC] AY; +00, 1, 1 [LF] [NUL].



The above sequence is also applied to the print position fine adjust command and the strip sensor adjust command.

Explanation of each command packet (when the length is designated in 1 byte) is shown below.

Print position fine adjust command

To send [ESC] AX; +000 [LF] [NUL].

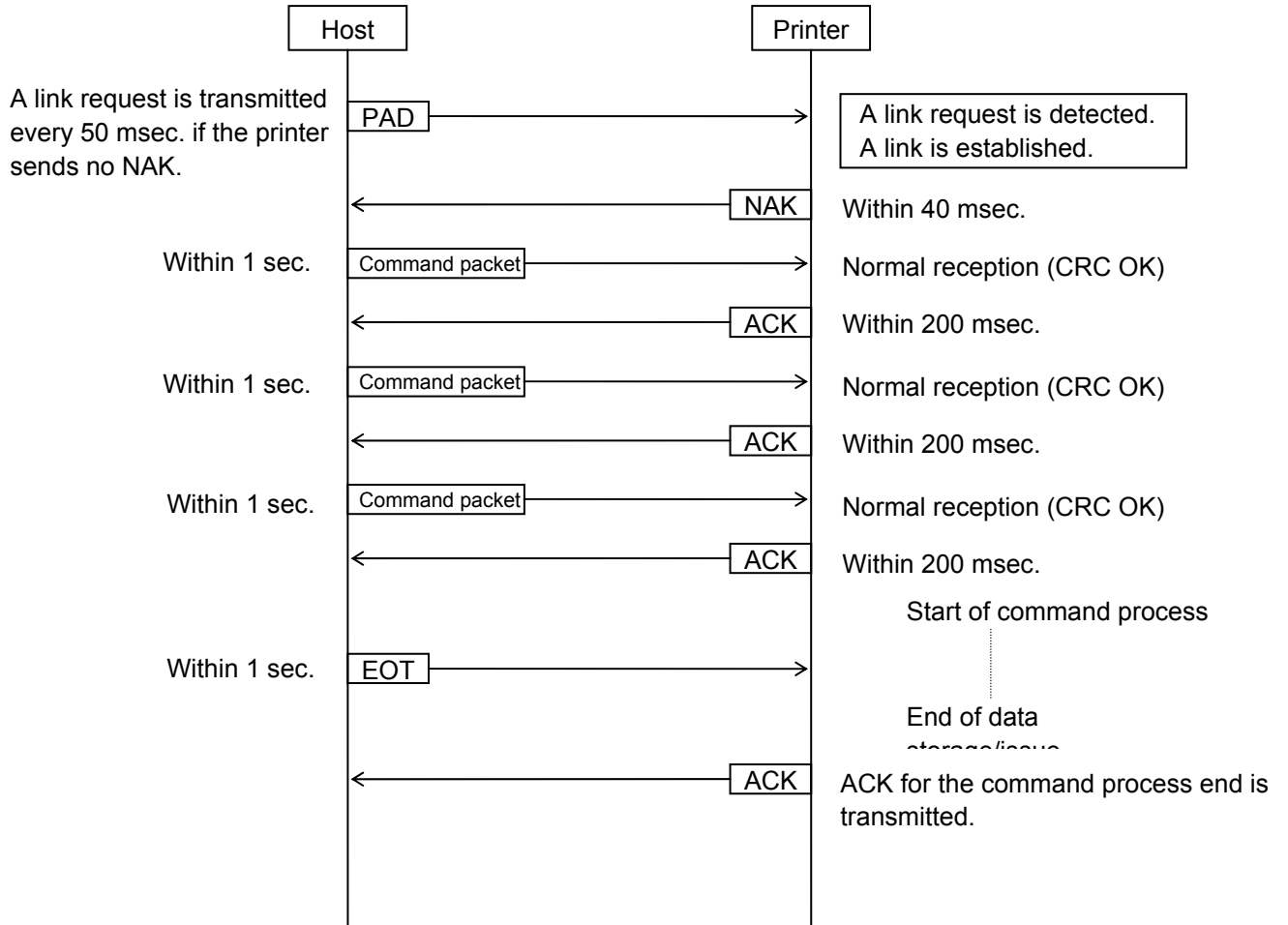
[02H] [00H] [00H] [0DH] [1BH] AX; +000 [0AH] [00H] [AAH] [44H]

Strip sensor adjust command

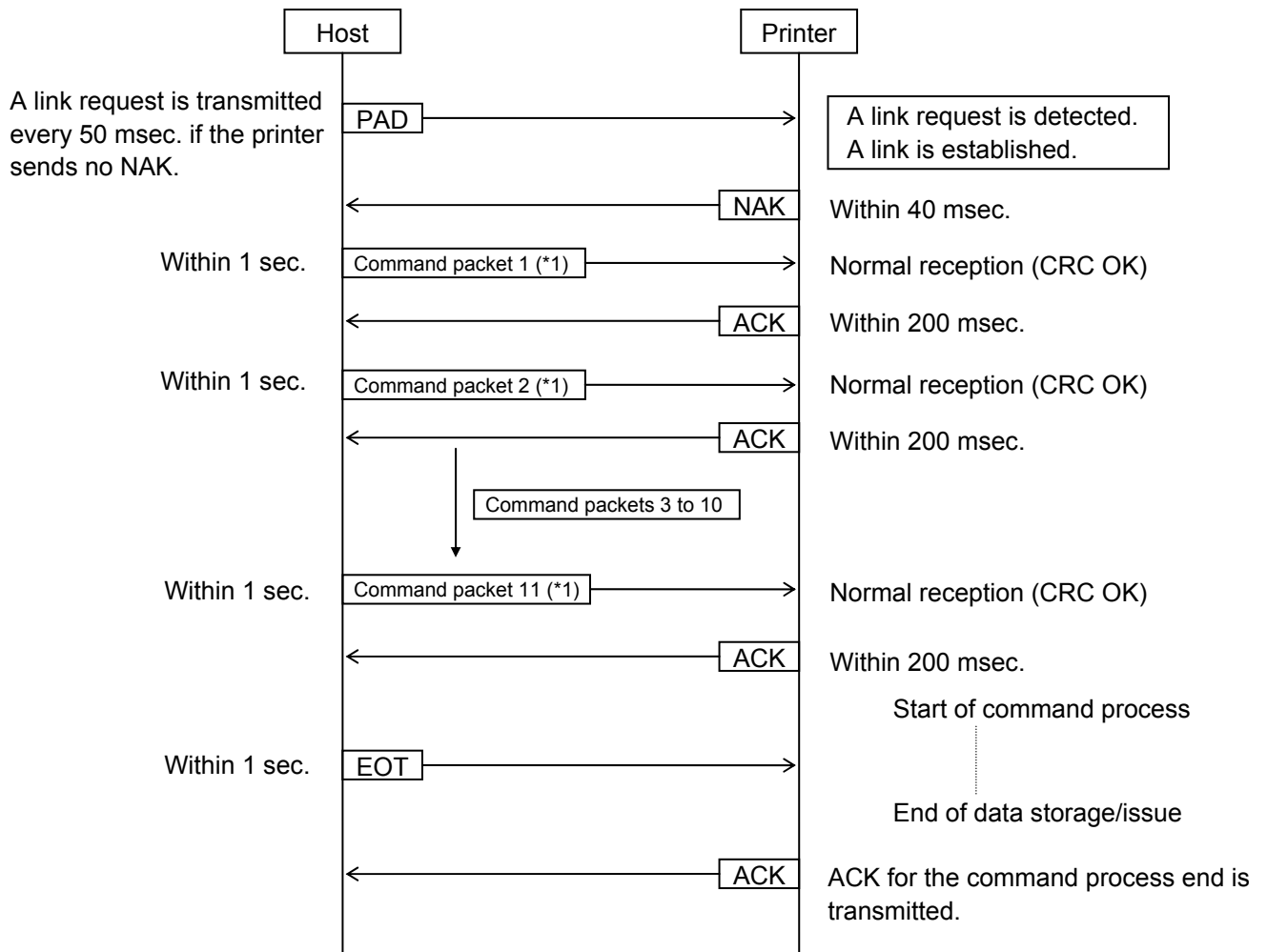
To send [ESC] AZ; 0 [LF] [NUL].

[02H] [00H] [00H] [0DH] [1BH] AZ; 0 [0AH] [00H] [34H] [F4H]

- When several packets are sent (for storing a form or graphics, or printing data).



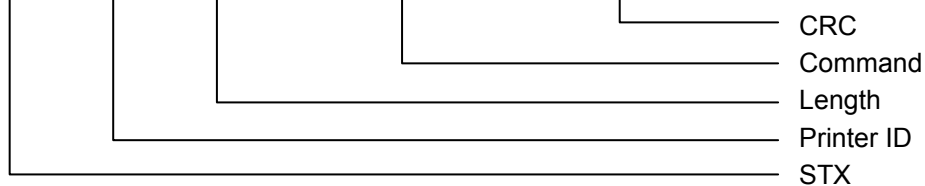
- When several packets are sent (for storing a form or graphics, or printing data).
(For storing a form by sending packets, each of them is including a command.)



*1: Explanation of command packets (when the length is designated in 1 byte.)

Command packet 1

[02H] [00H][00H] [0AH] [1BH]X0;01,1[0AH][00H] [E7H][24H]



Command packet 2

[02H][00H][00H][12H][1BH]D0630,0480,0600[0AH][00H][7BH][D1H]

Command packet 3

[02H][00H][00H][0DH][1BH]AY;+00,1,1[0AH][00H][6DH][67H]

Command packet 4

[02H][00H][00H][0AH][1BH]AX;+000[0AH][00H][AAH][44H]

Command packet 5

[02H][00H][00H][29H][1BH]PV01;0050,0250,0030,0030,A,00,B,00,1,0[0AH][00H][BBH][EEH]

Command packet 6

[02H][00H][00H][26H][1BH]PC02;0150,0100,4,4,A,00,B,00,1,0,P0[0AH][00H][D3H][00H]

Command packet 7

[02H][00H][00H][26H][1BH]PC03;0050,0200,2,2,A,00,B,00,1,0,P0[0AH][00H][F0H][F7H]

Command packet 8

[02H][00H][00H][2CH][1BH]XB04;0250,0350,0,3,02,0,0080,020,1,00,1,0[0AH][00H][76H][6CH]

Command packet 9

[02H][00H][00H][1DH][1BH]LC;0010,0010,0470,0500,1,3[0AH][00H][11H][E5H]

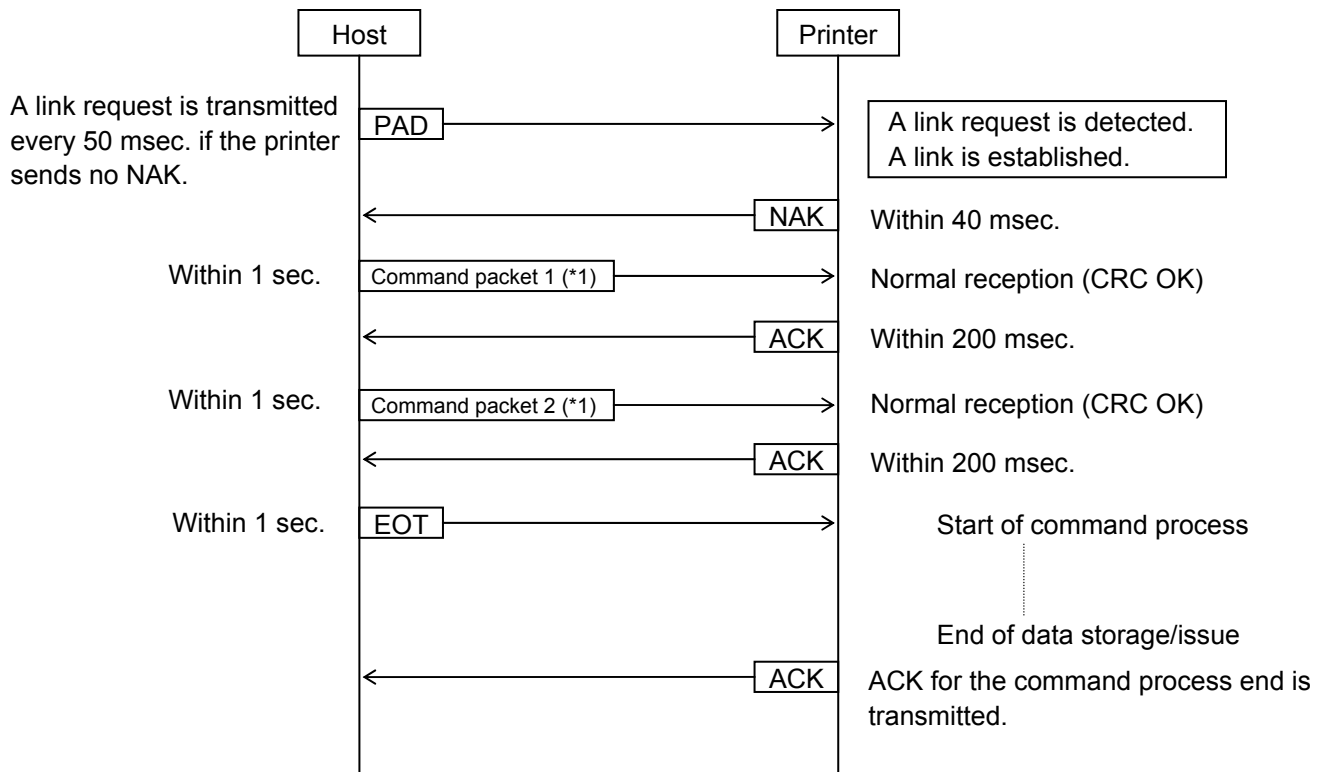
Command packet 10

[02H][00H][00H][10H][1BH]N;1,0050,0350[0AH][00H][EBH][46H]

Command packet 11

[02H][00H][00H][05H][1BH]XP[0AH][00H][05H][2AH]

- When several packets are sent (for storing a form or graphics, or printing data).
(For storing a form by sending packets, each of them is including several commands.)



- *1: Example of command packets for storing the form, each of them is including several commands (when the length is designated in 1 byte.)

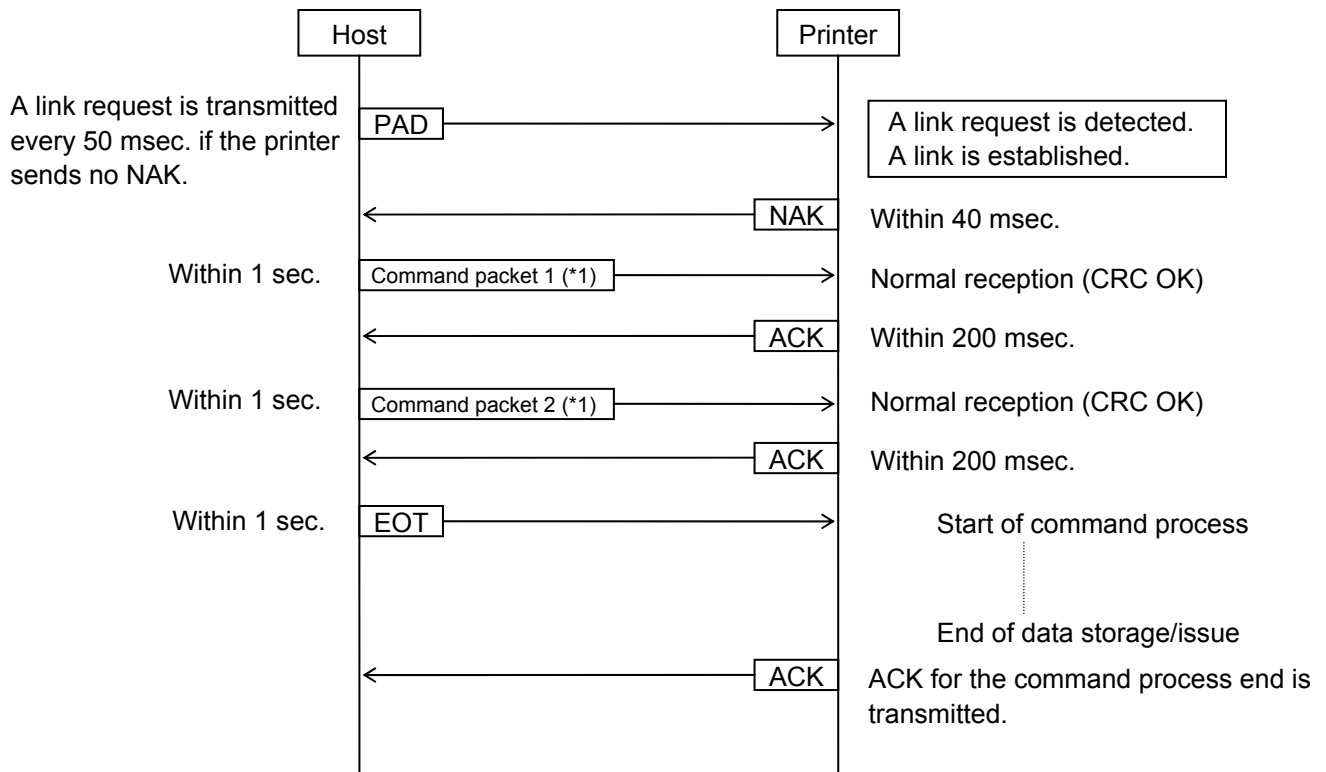
Command packet 1

```
[02H][00H][00H][F1H]
[1BH]XO;01,1[0AH][00H]
[1BH]D0630,0480,0600[0AH][00H]
[1BH]AY;+00,1,1[0AH][00H]
[1BH]AX;+000[0AH][00H]
[1BH]PV01;0050,0250,0030,0030,A,00,B,00,1,0[0AH][00H]
[1BH]PC02;0150,0100,4,4,A,00,B,00,1,0,P0[0AH][00H]
[1BH]PC03;0050,0200,2,2,A,00,B,00,1,0,P0[0AH][00H]
[1BH]XB04;0250,0350,0,3,02,0,0080,020,1,00,1,0[0AH][00H]
[1BH]LC;0010,0010,0470,0500,1,3[0AH][00H]
[9BH][EAH]
```

Command packet 2

```
[02H][00H][00H][15H]
[1BH]N;1,0050,0350[0AH][00H]
[1BH]XP[0AH][00H]
[AAH][5FH]
```

- When several packets are sent (for storing a form or graphics, or printing data)
(For storing graphics by sending packets, each of them is including several commands.)



*1: Example of command packets for storing graphics (when the length is designated in 1 byte.)

Command packet 1

[02H][00H][00H][FFH]

[1BH][SG;1,0050,0050,[FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

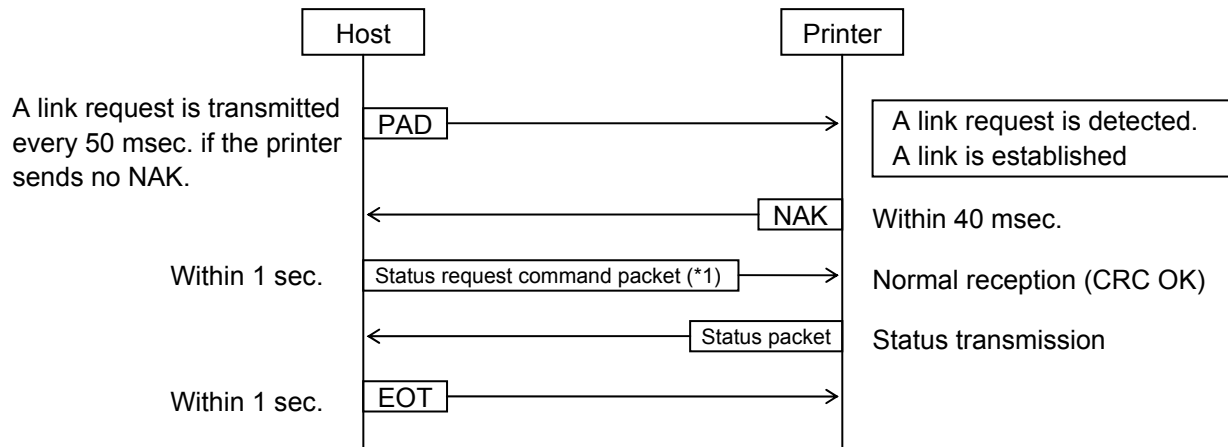
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]

Command packet 2

[02H][00H][00H][71H][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH][FFH]
[FFH][FFH][FFH][0AH][00H][7AH][1FH]

- When the Status Request Command is sent.



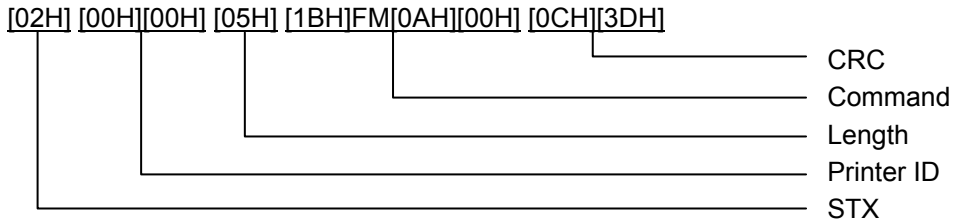
- When the host is started up, the host should send the Status Request Command to acquire the printer ID.
- When the printer ID in the command packet is set to "0", this command is acceptable for all printers.
- For the wireless LAN model or Bluetooth model:
After a specified time (5 seconds except for IrDA) has passed since the end of data transmission and reception, data from other interface can be received. Data received from another interface before the specified time has passed will be discarded.
When data is received from another interface during data transmission and reception with the IrDA interface, the printer interface will be automatically switched to the one from which the data has been received. In this case, the IrDA communication will fail.

Example of a command packet is shown below.

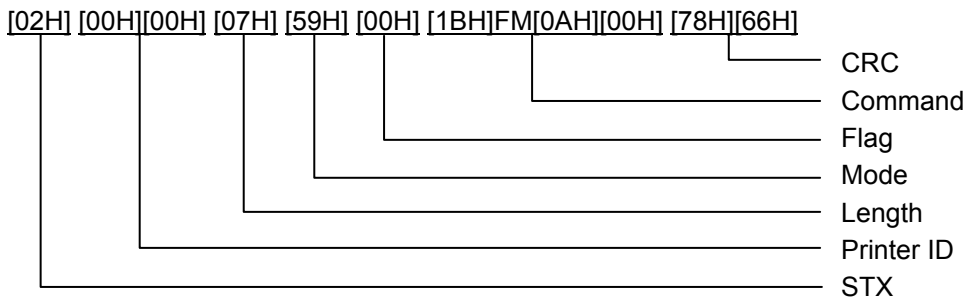
Since the status request command packet mode cannot identify the issue mode which is currently set in the printer, either of command packets below can be sent.

*1: When the status request command packet is FM command.

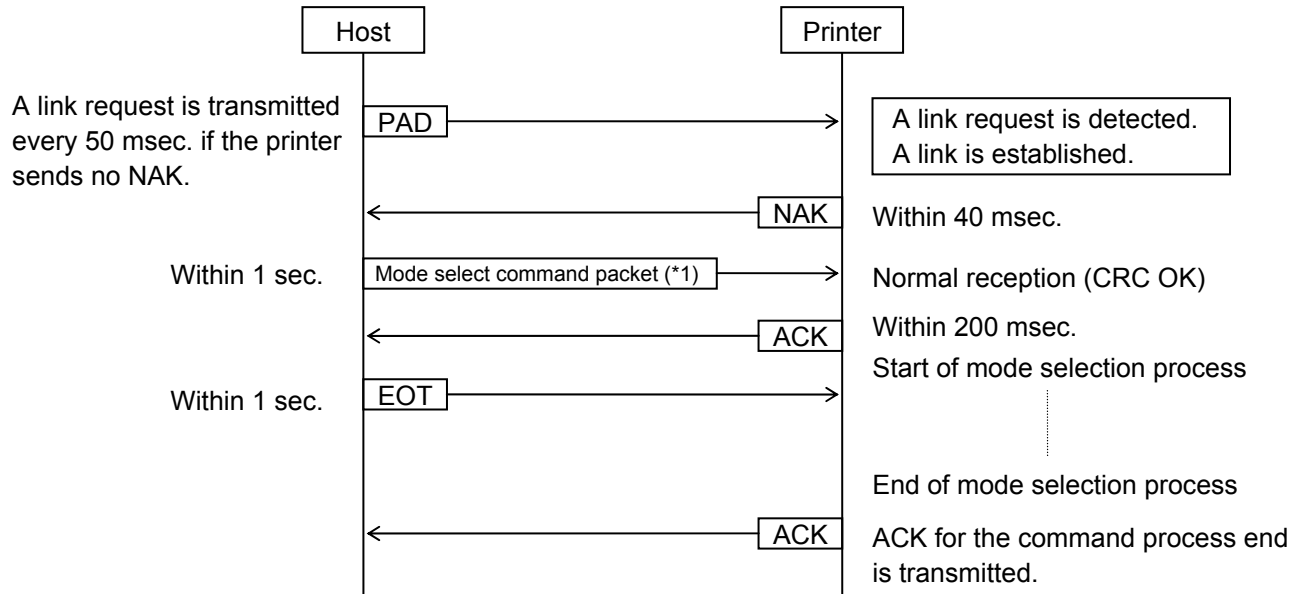
(The command packet in the LABEL mode, of which length is designated in 1 byte)



(The command packet in the RECEIPT mode, of which length is designated in 1 byte)



- When the Mode Select Command is sent.

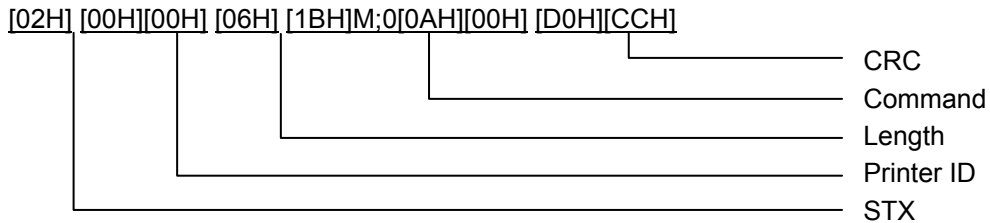


- When an EOT or other command data is not sent, after the mode select command packet is sent, the printer sends an ACK in 1 second after the mode select process is completed.

*1: Example of command in a command packet is shown below.

Since the mode select command packet mode cannot identify the issue mode currently set in the printer, either of command packets below can be sent.

- ① When a command packet includes mode select command (mode = 0)
(The command packet in the LABEL mode, of which length is designated in 1 byte)

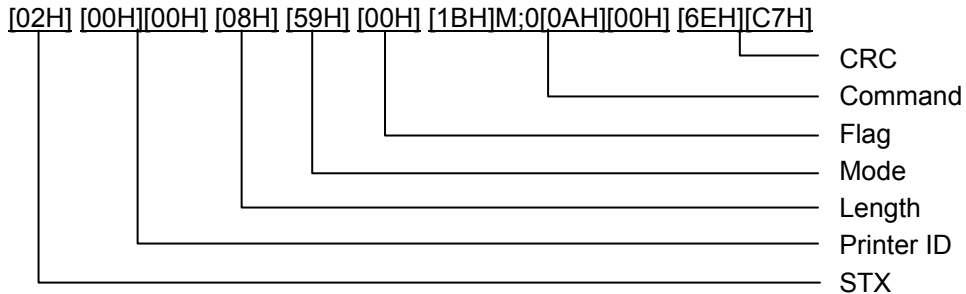


- ② When a command packet includes mode select command (mode = 1)
(The command packet in the LABEL mode, of which length is designated in 1 byte)

[02H] [00H] [00H] [06H] [1BH] M; 1 [0AH] [00H] [FFH] [96H]

③ When a command packet includes mode select command (mode = A)
(The command packet in the LABEL mode, of which length is designated in 1 byte)
[02H][00H][00H][06H][1BH]M;A[0AH][00H][D4H][16H]

④ When a command packet includes mode select command (mode = 0)
(The command packet in the RECEIPT mode, of which length is designated in 1 byte)

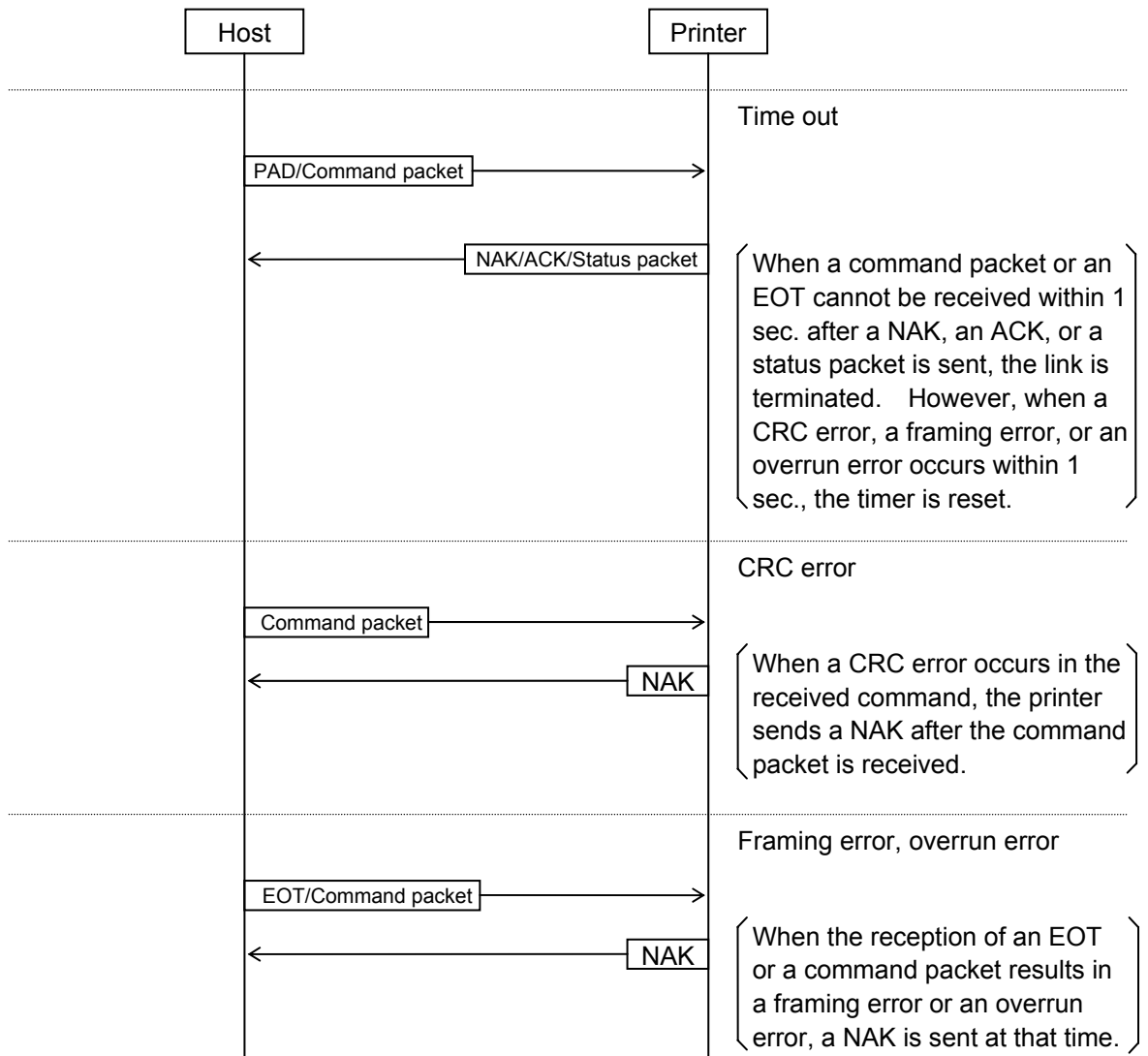


⑤ When a command packet includes mode select command (mode = 1)
(The command packet in the RECEIPT mode, of which length is designated in 1 byte)
[02H][00H][00H][08H][59H][00H][1BH]M;1[0AH][00H][B2H][9DH]

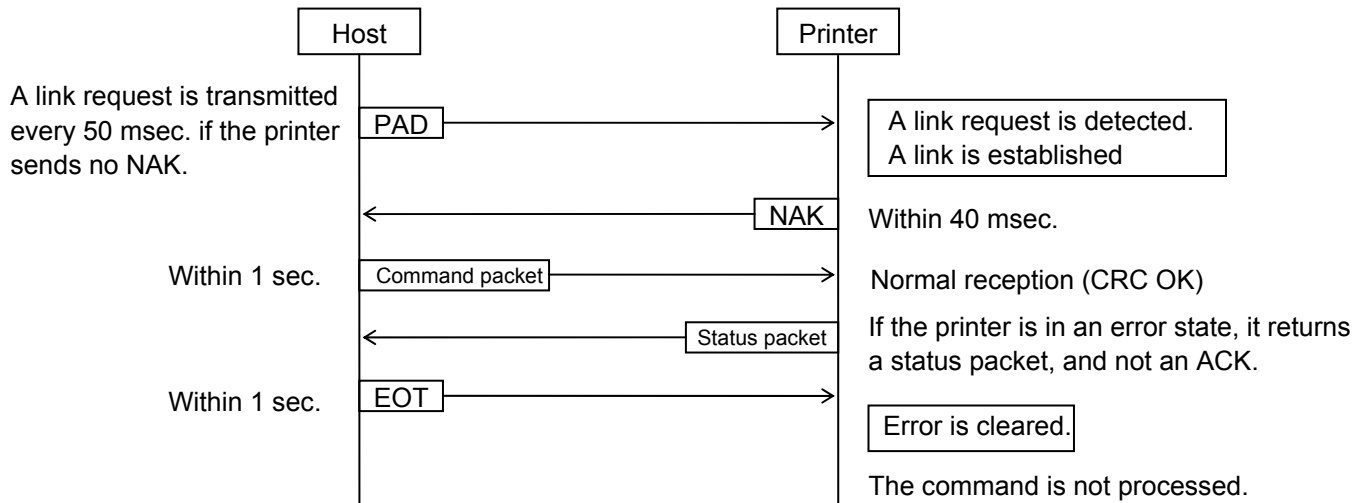
⑥ When a command packet includes mode select command (mode = A)
(The command packet in the RECEIPT mode, of which length is designated in 1 byte)
[02H][00H][00H][08H][59H][00H][1BH]M;A[0AH][00H][6AH][1DH]

<Error transmission>

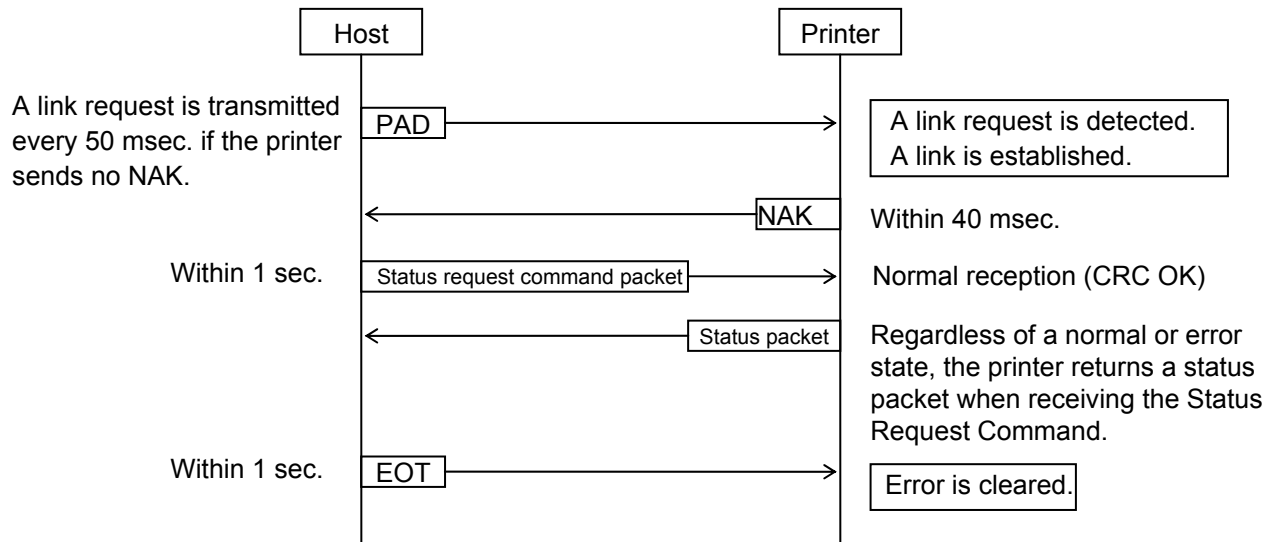
- When an error occurs during communication.



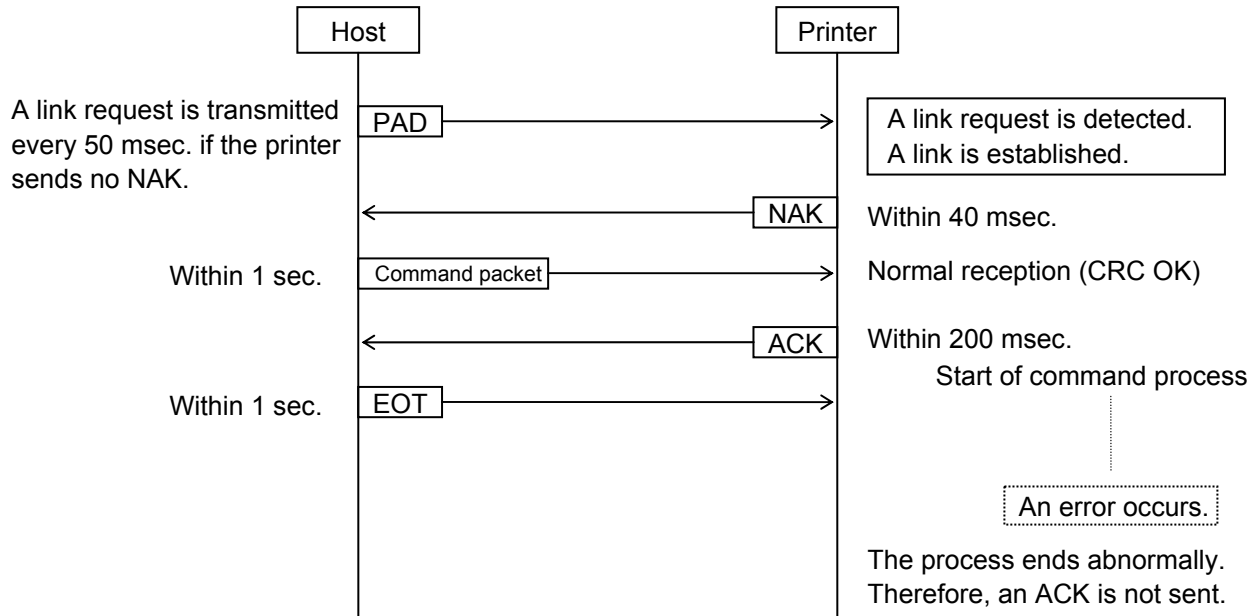
- When the communication is made during an error state.



- When the Status Request Command is sent during an error state.



- When an error occurs while the command is being processed.



Time out

Host: Time out due to waiting for a NAK after a PAD is sent50 msec.

(After time out, a PAD should be sent repeatedly.)

Time out due to waiting for an ACK after a command is sent....200 msec.

NOTE: The process time for issuing a label or storing data into flash ROM varies according to the contents to be processed. Therefore, time out waiting for an ACK is not set.

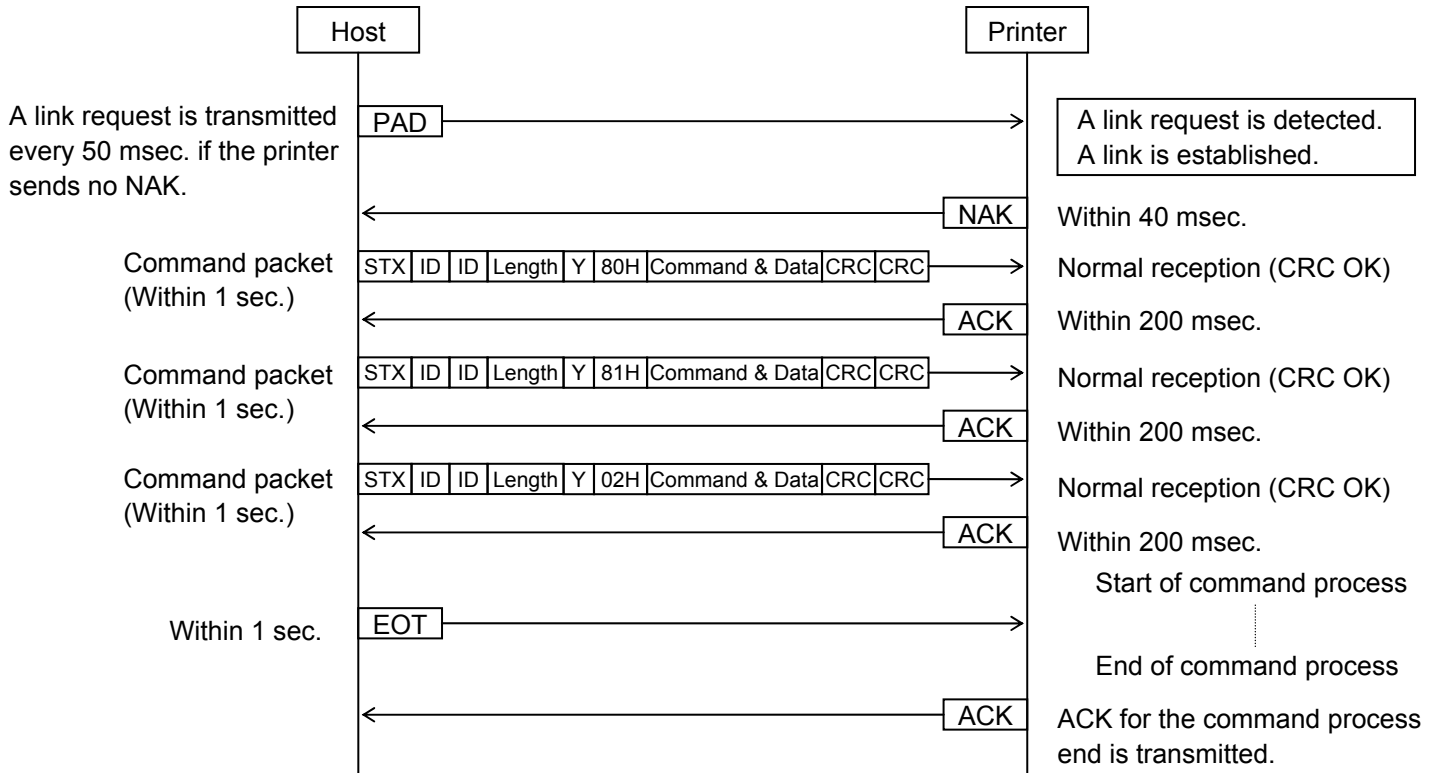
Printer: Time out due to waiting for a command after a NAK is sent..... 1 sec.

Time out due to waiting for an EOT or a command after an ACK is sent..... 1 sec.

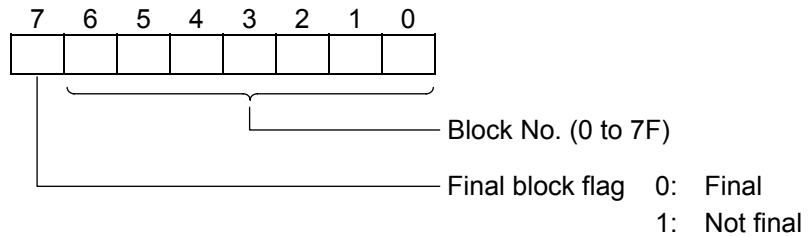
Time out due to waiting for an EOT after the status is sent..... 1 sec.

3.2.6 CONNECTION SEQUENCE EXAMPLE (TPCL, RECEIPT OR ESC/POS MODE)

The transmission control is basically the same as in the LABEL mode. Below is an example of the setting method for the flag of each command packet.

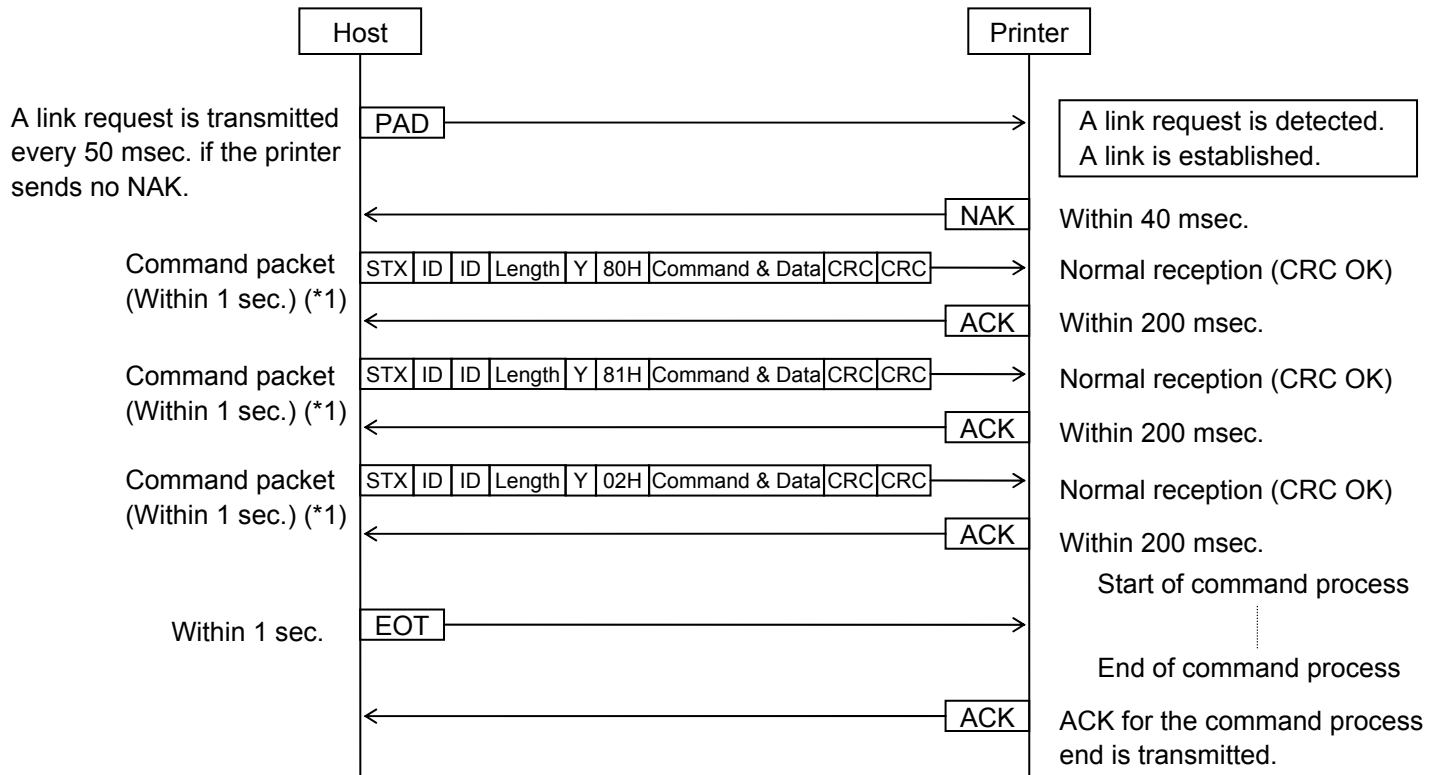


* Flag description:



- * After each packet is checked by CRC, the packets which pass the check are stored. When the final block is received normally, an issue is started.
- * 128 block Nos. can be set from 0 to 7F. (However, if the packet length is designated in 2 bytes, total data amount of all blocks must be 60 KB or less. Therefore, a maximum of 128 block Nos. may not be able to be set.) When 128 block Nos. (or 60 KB) are not enough, terminate the command transmission, and issue the receipt. After issuing the receipt, the remainder can be sent. If the next command packet is sent during an issue, it is discarded without being processed.
- * The block Nos. must be consecutive, starting from 0 (in ascending order). If the block Nos. are not consecutive, starting from 0 in ascending order, a command syntax error occurs. If the same block No. is received again before the final block is received, the block is discarded without being stored.
- * For the final block, the most significant bit must be cleared to 0. The printer starts an issue after the final block is received. Therefore, if this setting is not made, the printer does not start printing.

[TPCL mode]



*1: Example of command packets is shown below.

(When the length is designated in 1 byte and the printer ID of the command packet is 1.)

```

Command packet 1
[02H][00H][01H][FFH][59H][80H]
{D0630,0480,0600}
{AX;+000,+000,+00}
{AY;+00,1,1}
{T20C10}
{C}
{LC;0030,0030,0450,0550,1,5}
{LC;0030,0300,0450,0300,0,5}
{LC;0250,0300,0250,0550,0,5}
{PC01;0050,0110,2,2,A,+00,00,B,+0000000000,P1}
{PC02;0050,0200,1,1,A,+00,00,B,+000000}
[B6H][B7H]

```

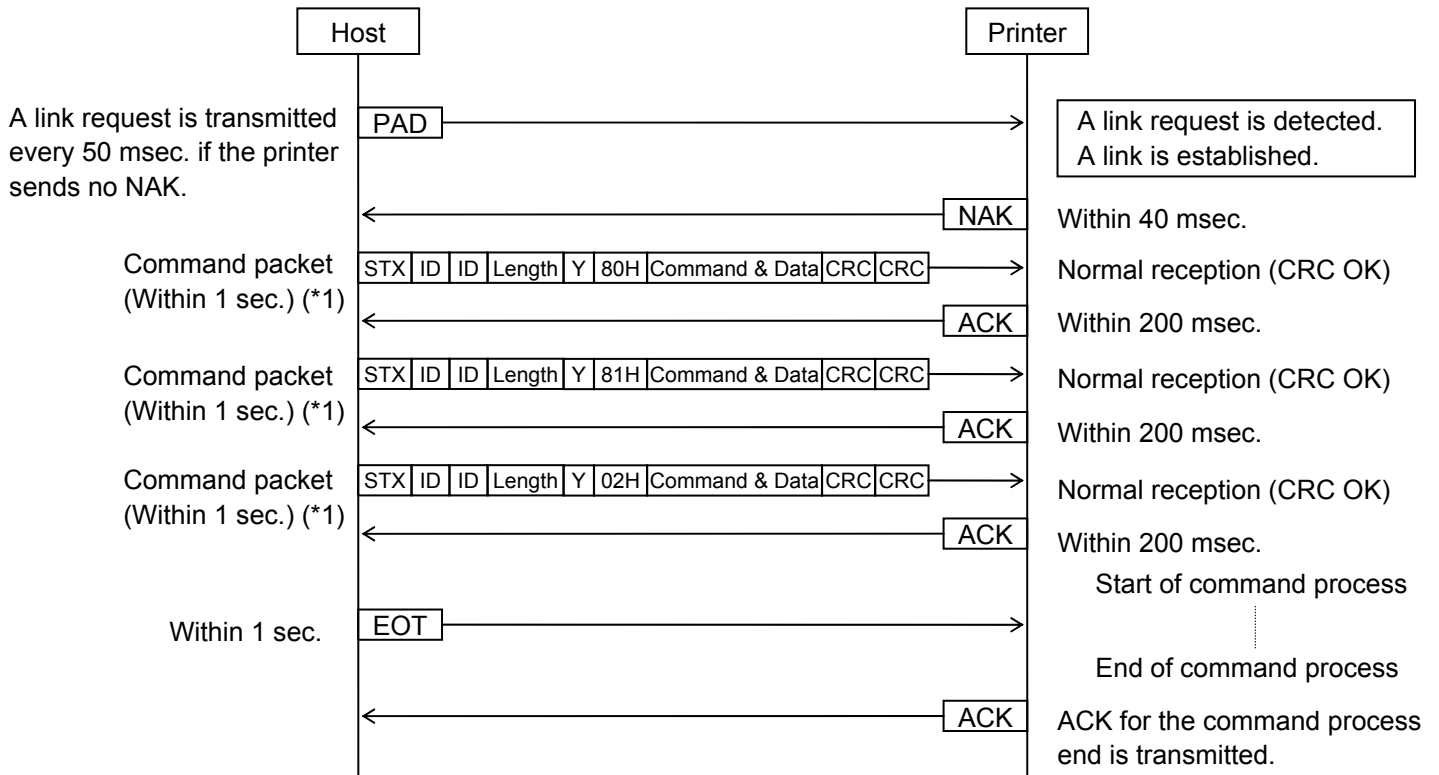
Command packet 2

```
[02H][00H][01H][FFH][59H][81H]
0000,P1}
{PV03;0050,0260,0030,0030,A,+000,00,B,M0,+0000000000,Z00,P1}
{XB04;0050,0380,0,3,02,0,0040,+0000000000,020,1,00}
{XB05;0290,0380,Q,11,03,01,0,C033033}
{RC01;Sample}
{RC02;BITMAPFONT}
{RV03;OUTLINEFONT}
{RB04;1234567}
{RB05;12345
[B8H][4BH]
```

Command packet 3

```
[02H][00H][01H][29H][59H][02H]
6789012345678901234567890123456789012345678901234}
{XS;l,0001,0002C1001}
[D1H][67H]
```

[RECEIPT or ESC/POS mode]



*1: Example of command packets (in the RECEIPT mode) is shown below.

(When the length is designated in 1 byte and the printer ID of the command packet is 849.)

Command packet 1

```
[02H][03H][51H][FFH][59H][80H]
[1BH]W384[1BH]H000[1BH]3
[1BH]a1[1BH]![30H][1BH]O+010[1BH]L3360[0AH][1BH]KCSample[0AH][0AH][1BH]!
[00H][1BH]a0[1BH]KABITMAPFONT[0AH][1BH]![30H][1BH]KABITMAPFONT[0AH]
[1BH]![60H][1BH]KABITMAPFONT[0AH][0AH][1DH]w[02H][1DH]hp[1DH]H1
[1BH]O+000[1DH]k3*1234567890*[00H][0AH][0AH][0AH][1BH]O+100[1BH]L1210[0AH]
[1BH]![00H][1BH]a1[1DH]:12345678901234567890[0AH]12345678901234567890[0AH]
12345678901234567890[0AH]12345678901234567890[0AH]12345678
[25H][5DH]
```

Command packet 2

```
[02H][03H][51H][FFH][59H]
901234567890[0AH]12345678901234567890[0AH]12345678901234567890[0AH]12345
678901234567890[0AH]12345678901234567890[0AH]12345678901234567890[0AH]1234
56789012345678[0AH]#####[1DH]:[0AH][1DH]~ABCDEFGHIJKLM[00H][0AH]
[0AH][1BH]a[30H][1BH]KVA030030OUTLINEFONT[0AH][1BH]KVB030030OUTLINEFONT[0AH]
[0AH][1DH]w[04H][1DH]hh[1DH]qM[1DH]r1[1DH]kT1234567890[00H][0AH]
[0AH][1DH]w[03H][1DH]h[03H][1DH]s[00H][1DH]c[01H][1DH]kP
[02H][93H]
```

Command packet 3

```
[02H][03H][51H][55H][59H][02H]
123456789012345678901234567890123456789012345678901234567890[00H]
```

[0AH][0AH][1BH]O+010[1BH]L3360[0AH][0AH][0AH]
[C3H][97H]

3.2.7 PRINTER STATE TRANSITION (LABEL MODE)

Printer state transition

Event \ State	Ensuring link	Issue Command reception	End of issue	Status Request Command reception	EOT reception	Time out	CRC error	Syntax error, Storage error, Error during issuing
		Store Command reception	End of storage					
Wait state for the link S1	NAK transmission → S2	—	—	—	—	—	—	—
Wait state for a command after the NAK transmission S2	—	Normal ACK transmission Command analysis → S3	—	Normal Status transmission → S3		End of link → S1	NAK transmission → S2	
		Error Status transmission → S4	—	Error Status transmission → S4				
Wait state for a command/EOT after the ACK transmission S3	—	ACK transmission Command analysis → S3	EOT has been received ACK transmission (NOTE 1) → S1	Status transmission → S3	Store Command Start of storage process → S3	End of link (NOTE 2) → S1	NAK transmission → S2	
			EOT has not been received → S3	Status transmission → S3	Issue Command ACK transmission if the issue is completed. (NOTE 1) → S1 If the issue is not completed → S3 Status Request Command → S1			
Wait state for an EOT after the status transmission S4	—	Status transmission → S4	—	Status transmission → S4	Clear of error → S1	End of link → S1	—	→ S1

- NOTES:**
1. Only when the ACK transmission for the process end is specified by the Data Print Command, an ACK is sent after an issue is completed.
 2. An ACK for the command process end is also sent, when the time out occurs during the wait state for an EOT.

Host state transition

Event \ State	NAK reception	ACK reception		Status reception	Time out (NOTE 1)	CRC error Framing error Overrun error	Activation of transmission to the printer
Wait state for a NAK for the link request S1	Command transmission → S2	→ S1		→ S1	→ S1	→ S1	—
Wait state for an ACK/status after the command transmission S2	Command retransmission → S2	Middle block Command transmission → S2	Final block EOT transmission → S3 or → S4	EOT transmission → S4	→ S4	→ S4	—
Wait state for an ACK after the EOT transmission S3	—	→ S4		→ S4	→ S4	→ S4	—
Key entry mode S4	→ S4	→ S4		→ S4	—	—	→ S1

NOTE: The retry count is arbitrarily determined by the host.

3.2.8 PRINTER STATE TRANSITION (TPCL, RECEIPT OR ESC/POS MODE)

Printer state transition

Event State	Ensuring link	Reception of the middle block packet	Reception of the final block packet	End of issue	Status Request Command reception	EOT reception	Time out	CRC error	Framing error Overrun error	Syntax error Error during issuing
Wait state for the link S1	NAK transmission → S2	—	—	—	—	—	—	—	—	—
Wait state for a packet after the NAK transmission S2	—	Normal ACK transmission → S3	Normal ACK transmission Command analysis → S3	—	Normal Status transmission → S3	—	End of link → S1	NAK transmission → S2	NAK transmission → S2	—
		Error Status transmission → S4	Error Status transmission → S4	—	Error Status transmission → S4					
Wait state for a packet/EOT after the ACK transmission S3	—	ACK transmission → S3	ACK transmission Command analysis → S3	EOT has been received. ACK transmission → S1	Status transmission → S3	Normal command ACK transmission if the issue is completed. → S1 If the issue is not completed → S3	End of link (NOTE 1) → S1	NAK transmission → S2	NAK transmission → S2	—
				EOT has not been received		Status request → S1				
Wait state for an EOT after the status transmission S4	—	Status transmission → S4	Status transmission → S4	—	Status transmission → S4	Clear of error → S1	End of link → S1	—	Timer reset → S4	—

NOTE: An ACK for the command process end is also sent, when the time out occurs during the wait state for an EOT.

Host state transition

Event State	NAK reception	ACK reception		Status reception	Time out (NOTE 1)	CRC error Framing error Overrun error	Activation of transmission to the printer
Wait state for a NAK of the link request S1	Command transmission → S2	— → S1		— → S1	— → S1	— → S1	—
Wait state for an ACK/status after the command transmission S2	Packet retransmission → S2	Middle block Packet transmission → S2	Final block EOT transmission → S3 or → S4	EOT transmission → S4	— → S4	— → S4	—
Wait state for an ACK after the EOT transmission S3	—	— → S4		— → S4	— → S4	— → S4	—
Key entry mode S4	— → S4	— → S4		— → S4	—	—	→ S1

NOTE: The retry count is arbitrarily determined by the host.

3.2.9 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE

When data is divided into multiple blocks in IrDA: TEC Protocol and received, the printer discards previously received data and goes into a wait state to receive data from the first block if reception is stopped and a timeout occurs (power save mode).


During single block, the printer discards partially received data and goes into a wait state to receive data from the first "STX" if reception is stopped and a timeout occurs (power save mode), because the reception mode changes to the "STX reception wait state."

3.3 IrDA (IrCOMM) INTERFACE

The protocol for IrComm specifications is provided.

Application layer
IrComm
Tiny TP
IrLMP
IrLAP
IrDA-SIR

IrDA V1.2 (Low Power) standard

 parts are required.

Item	Specifications
Communication mode	Physical layer conforming to IrDA-SIR V1.2 (Low Power) standard
Transfer speed	9600, 19200, 38400, 57600, 115200 bps ^{*1}
Communication distance	within 0.2 m ^{*2}
Peak wave length of emitted light	850 to 900 nm
Communication angle	within $\pm 15^\circ$
Ambient illuminance	1000 lx or less (fluorescent lamp and incandescent lamp)
Emissive power	Min 3.6 mW/Sr ($\theta_h, \theta_v \leq \pm 15^\circ$)
Min. photo sensibility	Min 9 $\mu\text{W}/\text{cm}^2$ ($\theta_h, \theta_v \leq \pm 15^\circ$)

*1: Values are dependent on the communication protocol settings.

*2: The communication distance may become shorter than 0.2 m, depending on the host's performance.

Device nickname: 2-inch/203-dpi modelB-EP2DL-G
 4-inch/203-dpi modelB-EP4DL-G
 Service name (Class name): IrDA: IrCOMM
 Min. turnaround time: 1 msec
 Link termination threshold time: 12 sec

3.3.1 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE


Data is left in the received buffer until reception is stopped and a timeout occurs (power save mode) because the received buffer has not been initialized.

3.4 IrDA (IrOBEX) INTERFACE

The protocol for IrOBEX specifications is provided.

Application layer
IrOBEX
Tiny TP (PTTP1)
IrLMP (LMP3)
IrLAP
IrDA-SIR

IrDA V1.2 (Low Power) standard

 parts are required.

Item	Specifications
Communication mode	Physical layer conforming to IrDA-SIR V1.2 (Low Power) standard
Transfer speed	9600, 19200, 38400, 57600, 115200 bps ^{*1}
Communication distance	within 0.2 m ^{*2}
Peak wave length of emitted light	850 to 900 nm
Communication angle	within $\pm 15^\circ$
Ambient illuminance	1000 lx or less (fluorescent lamp and incandescent lamp)
Emissive power	Min 3.6 mW/Sr ($\theta_h, \theta_v \leq \pm 15^\circ$)
Min. photo sensibility	Min 9 $\mu\text{W}/\text{cm}^2$ ($\theta_h, \theta_v \leq \pm 15^\circ$)

*1: Values are dependent on the communication protocol settings.

*2: The communication distance may become shorter than 0.2 m, depending on the host's performance.

Device nickname: 2-inch/203-dpi modelB-EP2DL-G
 4-inch/203-dpi modelB-EP4DL-G
 Service name (Class name): IrDA: IrOBEX
 Min. turnaround time: 1 msec
 Link termination threshold time: 12 sec

3.4.1 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE

Data is left in the received buffer until reception is stopped and a timeout occurs (power save mode) because the received buffer has not been initialized.

3.5 RS-232C INTERFACE

Item	Specifications
	Normal mode
Communication mode	Start-stop synchronization mode
Communication direction	Transmission/reception (Full duplex)
Transmission rate	9600, 19200, 38400, 57600, 115200 bps ^{*1}
Start bit	1 bit
Stop bit	1 bit
Data length	8 bits
Parity	None/Even (depending on the setting)
Error detection ^{*2}	Overrun error
	Framing error
	Parity error
Received buffer	512K bytes

*1: Values are dependent on the communication protocol settings.

*2: Error detection is available in the RECEIPT mode only.

3.5.1 TRANSMISSION CONTROL (XON/XOFF PROTOCOL)

- The printer sends an XOFF code (13H) to the host, when the blank positions in the receive buffer become 10Kbytes or less.
- The printer sends an XON code (11H) to the host, when the blank positions in the receive buffer become 256Kbytes or more.
- When there are no blank positions in the receive buffer, the printer discards the received data which exceeds the receive buffer capacity without storing it in the buffer, and the buffer full error occurs. (After detecting the XOFF code, the host must stop transmission before the printer receive buffer becomes full.)

3.5.2 NOTES WHEN SENDING A COMMAND

- In the LABEL mode, when any of the commands below are sent, the host should send the next command after receiving the process end status. If the host sends the next command before receiving the process end status, the printer may discard it without receiving.
 - Print Density Fine Adjust Command (If it is not stored in the form)
 - Print Position Fine Adjust Command (If it is not stored in the form)
 - Form Store Terminate Command
 - Graphic Data Store Command
 - Printer ID Set Command
 - Flash Memory Storage Area Format Command
 - Writable Character Data Store Command
 - Status Request Command
 - Mode Select Command
 - Strip Sensor Adjust Command
 - Data Print Command
 - * When automatic status transmission is not specified by the Data Print Command, the issue end status is not sent. Therefore, check the printer status by transmitting the Status Request Command. When the printer status is idling, the next command should be sent.
- In the TPCL mode, when the automatic status response is selected, the host sends a response when receiving an error, print end, or feed end status.
- In the RECEIPT mode, the host sends a status when receiving an error status, though there is no automatic status response selection. To the print end and feed end statuses, the host does not return any status.
- In the ESC/POS mode, the automatic status response cannot be selected. To the print end and feed end statuses, the host does not return any status. (A response is made with the Status Request Command only.)

- Contents of the status

[LABEL, RECEIPT or ESC/POS mode]

Data to be sent (Fixed at 5 bytes)

STX	Printer ID		Printer status	Battery status
02H	xxH	xxH	xxH	xxH

- Printer ID 2-byte hex data (in order from High to Low)
- Printer status... Printer status is indicated in 1-byte data.
 - 00H: Normal state (idling)
 - 01H: Cover open state
 - 02H: Command syntax error (including Ir packet error)
 - 03H: Paper jam
 - 04H: Label end
 - 05H: Cover open error
 - 06H: Broken head dots error
 - 07H: Thermal head excessive temperature
 - 08H: Flash ROM write error
 - 09H: Flash ROM erase error
 - 0AH: Low battery (Print failure)
 - 0BH: Operating
 - 0CH: Communication error * In the RECEIPT mode or for RS-232C connection only
 - 0DH: Normal end + Label end (See **NOTE**.)
 - 0EH: Flash ROM storage area full state
 - 0FH: Wait for strip * In the LABEL mode only
 - 10H: Normal issue end
 - 14H: Pause state
 - 19H: Ambient temperature error
 - 32H: Abnormal battery temperature
 - 33H: Battery excessive temperature
 - 37H: Charging error
 - 38H: Bluetooth setting successfully completed
 - 39H: Bluetooth setup error (including initialization error)
 - 45H: Wait for battery recovery
 - 46H: Wait for head temperature reduction
 - 47H: Wait for motor temperature reduction
 - 55H: Writable character/PC command save mode

NOTE: *In the LABEL mode, this is a state when the printer runs out of labels, after the effective print length is printed. In the RECEIPT mode, this status is returned to the host, when the printer runs out of labels, after a receipt is issued.*

- Status in the compatible mode for the B-SP series
 - 00H: Normal state (idling)
 - 01H: Cover open state
 - 02H: Command syntax error (including Ir packet error)
 - 03H: Paper jam
 - 04H: Label end
 - 05H: Cover open error
 - 06H: Broken head dots error
 - 07H: Thermal head excessive temperature (including ambient temperature error, abnormal battery temperature, and battery excessive temperature)
 - 08H: Flash ROM write error
 - 09H: Flash ROM erase error
 - 0AH: Low battery (Print failure)
 - 0BH: Operating (including wait for strip, pause state, writable character/PC command save mode, wait for battery recovery, wait for head temperature reduction, and wait for motor temperature reduction)
 - 0CH: Communication error * In the RECEIPT mode or for RS-232C connection only
 - 0DH: Normal end + Label end
 - 0EH: Flash ROM storage area full state
 - 10H: Normal issue end
 - 37H: Charging error
 - 38H: Bluetooth setting successfully completed
 - 39H: Bluetooth setup error (including initialization error)

- Battery status .. The battery charge status is indicated in 5 levels.

(B-EP2DL)

- 01H: 7.2 V or less (Print failure)
- 02H: 7.3 V to 7.4 V (remaining No. of printable labels: Approx. 1 to 30)
- 03H: 7.5 V to 7.7 V (remaining No. of printable labels: Approx. 30 to 150)
- 04H: 7.8 V to 7.9 V (remaining No. of printable labels: Approx. 150 to 300)
- 05H: 8.0 V to 8.4 V (remaining No. of printable labels: Approx. 300 or more)

(B-EP4DL)

- 01H: 14.0 V or less (Print failure)
- 02H: 14.1 V to 14.6 V (remaining No. of printable labels: Approx. 1 to 30)
- 03H: 14.7 V to 15.2 V (remaining No. of printable labels: Approx. 30 to 150)
- 04H: 15.3 V to 15.9 V (remaining No. of printable labels: Approx. 150 to 300)
- 05H: 16.0 V to 16.8 V (remaining No. of printable labels: Approx. 300 or more)

- * The remaining number of printable labels may vary according to the contents to be printed and the ambient environment.

[TPCL mode]

Data to be sent

SOH	STX	Status			Remaining No. of labels				ETX	EOT	CR	LF
01H	02H	3xH	3xH	3xH	3xH	3xH	3xH	3xH	03H	04H	0DH	0AH

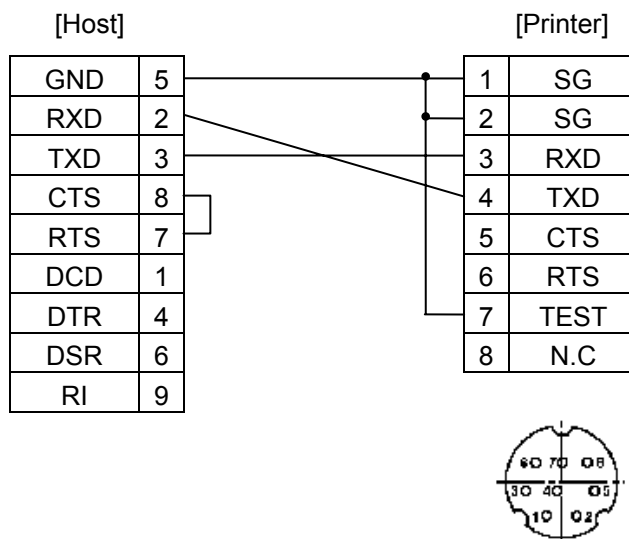
- Detailed status is indicated in 2-byte data.
 - “00”: Normal state
 - “01”: Cover open state
 - “02”: Operating
 - “04”: Pause state
 - “05”: Wait for strip
 - “06”: Command syntax error (including Ir packet error)
 - “09”: Normal issue end + Label end
 - “11”: Paper jam
 - “13”: Label end
 - “15”: Cover open error
 - “17”: Broken head dots error
 - “18”: Thermal head excessive temperature
 - “19”: Ambient temperature error
 - “32”: Abnormal battery temperature
 - “33”: Battery excessive temperature
 - “36”: Low battery
 - “37”: Charging error
 - “38”: Bluetooth setting successfully completed
(→ No response with Status Request Command)
 - “39”: Bluetooth setup error (including initialization error)
 - (“40”: Normal issue end) Response status for automatic status transmission
 - (“41”: Normal feed end) Response status for automatic status transmission
 - “45”: Wait for battery recovery
 - “46”: Wait for head temperature reduction
 - “47”: Wait for motor temperature reduction
 - “50”: Flash ROM write error
 - “51”: Flash ROM erase error
 - “54”: Flash ROM storage area full state
 - “55”: Writable character/PC command save mode

- Detailed status in the compatible mode for the B-SP series
 - “00”: Normal state
 - “01”: Cover open state
 - “02”: Operating (Including wait for strip, pause state, wait for battery recovery, wait for head temperature reduction, wait for motor temperature reduction, and writable character/PC command save mode)
 - “06”: Command syntax error (including Ir packet error)
 - “09”: Normal issue end + Label end
 - “11”: Paper jam
 - “13”: Label end (including)
 - “15”: Cover open error
 - “17”: Broken head dots error
 - “18”: Thermal head excessive temperature (Including ambient temperature error, abnormal battery temperature, and battery excessive temperature)
 - “36”: Low battery
 - “37”: Charging error
 - “38”: Bluetooth setting successfully completed
(→ No response with Status Request Command)
 - “39”: Bluetooth setup error (including initialization error)
 - (“40”: Normal issue end) Response status for automatic status transmission
 - (“41”: Normal feed end) Response status for automatic status transmission
 - “50”: Flash ROM write error
 - “51”: Flash ROM erase error
 - “54”: Flash ROM storage area full state
- Status type Indicated in 1-byte data
 - “1”: Status Request Command
 - “2”: Automatic status transmission
- Remaining No. of labels.... Indicated in 4-byte data
 - “0000” to “9999”
- CR/LF Indicated in 2-byte data

(1) Connector pin diagram and signal description

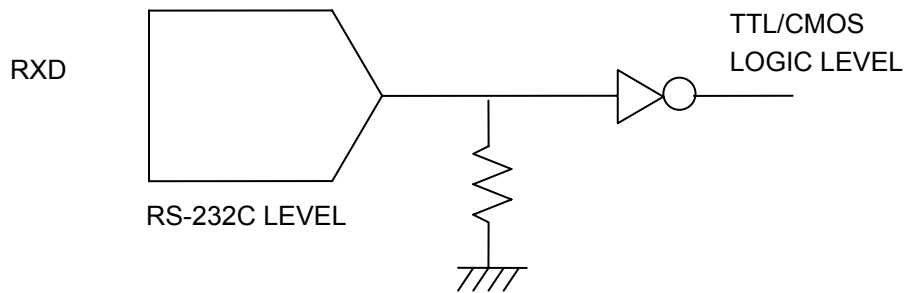
Pin No.	Signal name	Function	Signal direction
1	SG	Ground line for all data and control signals. (without the noise filter)	-
2			
3	RXD	Line for data which the host sends to the printer. Logic "1" is a "Low" level, while logic "0" is a "High" level. It is in a "Low (Mark)" state when no transmission is in progress. In power save mode, it should be in a "Low (Mark)" state. If it is in a "High" state, the printer cannot be returned to the normal state from the power save mode by opening/closing the cover, or pressing the [POWER] switch or the [FEED] switch.	← Host
4	TXD	Line for data which the printer sends to the host. Logic "1" is a "Low" level, while logic "0" is a "High" level. It is in a "Low (Mark)" state when no transmission is in progress. It is in a high impedance state in power save mode.	Printer →
5	CTS	N/A	-
6	RTS	N/A	-
7	TEST	The signal is connected with SG.	-
8	N.C		-

(2) Wire connection diagram

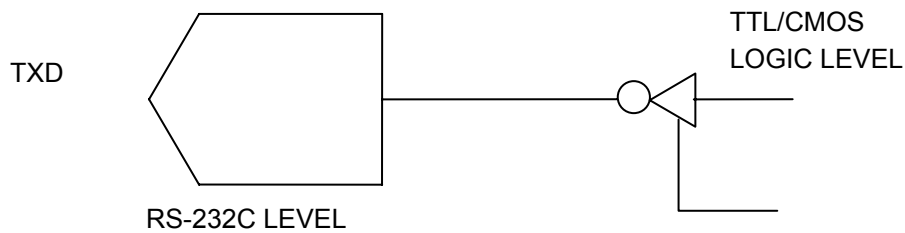


(3) Interface circuit

• Input circuit



• Output circuit



Signal levels

Input voltage	H.... +2.4 V to +25 V L..... -25 V to -0.6 V
Output voltage	H.... Min. +5.0 V Typ +5.4 V L..... Min. -5.0 V Typ -5.4 V

(4) Connector used for the communication cable

• For the printer

Manufacturer: HOSHIDEN
Model name: TCP8685 or equivalent

• For the host

Manufacturer: DDK
Model name: 17JE-13090-02-D8C or equivalent

3.5.3 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE

Data is left in the received buffer until reception is stopped and a timeout occurs (power save mode) because the received buffer has not been initialized.

3.6 USB INTERFACE

- (1) Supported standard : Complying with USB Standard Rev. 2.0
- (2) Supported transfer type : Control transfer and bulk transfer
- (3) Transfer rate : Full-speed (12 Mbps)
- (4) Transfer control method : A status with the receive buffer remaining capacity data shown below is returned against the lead request just after [ESC] WB [LF] [NUL].
The host uses it to transfer data without making the receive buffer full.

- Receive Buffer Free Space Status

Commonly used in all modes (TPCL, TPCL1, LABEL, RECEIPT, RECEIPT1, or ESC/POS)

Status after [ESC] WB [LF] [NUL] (23 bytes)

SOH	01H	Header of the status block
STX	02H	
Status	3XH	Printer status
	3XH	* Details are described later.
Status type	33H	This indicates a status with free space of the receive buffer included.
Remaining count	3XH	Remaining print count "0000" (0 label/tag) to "9999"(9999 labels/tags)
	3XH	
	3XH	
	3XH	
Length	32H	Total number of bytes of this status block
	33H	"23" (23 bytes)
Free space of receive buffer	3XH	Free space of the receive buffer "00000" (0K byte) to "00512" (512K bytes) However, the maximum value should be equal to the receive buffer capacity.
	3XH	
	3XH	
	3XH	
	3XH	
Receive buffer capacity	30H	Receive buffer capacity "00512"(512K bytes)
	30H	
	35H	
	31H	
	32H	
CR	0DH	Footer of the status block
LF	0AH	

3.6.1 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE

Data is left in the received buffer until reception is stopped and a timeout occurs (power save mode) because the received buffer has not been initialized.

3.7 BLUETOOTH INTERFACE

3.7.1 OUTLINED SPECIFICATIONS

Item	B-EP-GH30/TH30	B-EP-GH32
Communication method	Bluetooth V1.2 (with logo certification)	Bluetooth V2.1 + EDR (with logo certification)
Supported profile	Serial port profile	
Communication class	Class 2	
Communication distance	3 m/360°	
Service name	Serial Port Profile 1	SSP Dev
Device nickname	Programmable	
Factory default setting:	TOSHIBA TEC BT	
Flow control	Credit based flow control	
Operation mode	Slave mode	
PIN code	Available	
Receive buffer	Dynamic allocation	
Link break time out	20 sec.	
Inquiry control	Programmable	
Factory default setting:	Response is made at any time.	
SR mode and timer setting value at page/inquiry scanning	SR mode: R2 * The timer is programmable.	
Factory default setting:	Scan interval = 1.28 sec. Scan window = 22.5 msec.	
Device class	Major Device Class = Imaging Minor Device Class = Printer	
SSP authentication type	None (Not supported)	Selectable from the following four types: <ul style="list-style-type: none"> ▪ Just Works ▪ Numeric Comparison (No Input No Output) ▪ Numeric Comparison (Display Only) ▪ Numeric Comparison (Display YesNo)
Factory default setting	None	Just Works

* Although the SR mode of the printer is R2, that of the host is not necessarily R2. Connectivity depends on the situation. When the clock of the host is already synchronized with the printer (for example, after an inquiry is made or a connection has been once established after a power on), the highest connectivity is obtained by setting R2 in the SR mode of the host. When the host's clock is not synchronized with the printer, the connectivity will become the best when SR mode of the host is set to R0.

* SSP (Secure Simple Pairing) is a simplified pairing process supported from the B-EP-GH32, which requires no manual entry of PIN code.

3.7.2 BLUETOOTH DEVICE ADDRESS (BD ADDRESS)

As long as the Bluetooth interface has been installed on the printer, when the printer is turned ON, it prints the Bluetooth device address.

[Character]

The BD address is printed on the self-test result in the SYSTEM mode.

[Barcode]

Various parameters are printed by holding down the [POWER] switch (for 3 seconds or more after a message "ON LINE" is displayed on the LCD) at a power ON time.

For details, see the Key Operation Specifications.

3.7.3 STANDARD COMMUNICATION SEQUENCE OF BLUETOOTH INTERFACE

When Bluetooth interface is used, and if a connection between the host and the printer is disconnected right after a data transmission, the transmitted data may not be properly sent to the printer.

This should be avoided by performing one of the following methods on the application program.

- (1) Disconnecting the Bluetooth connection between the host and the printer after the host receives an end of job status from the printer and confirms the completion of the job.
- (2) Waiting for the minimum of 100 msec. after a data transmission to the printer before disconnecting the Bluetooth connection.
- (3) Maintaining the Bluetooth connection while a series of print jobs are performed on the application, and disconnecting the connection by key operations when exiting the print job.

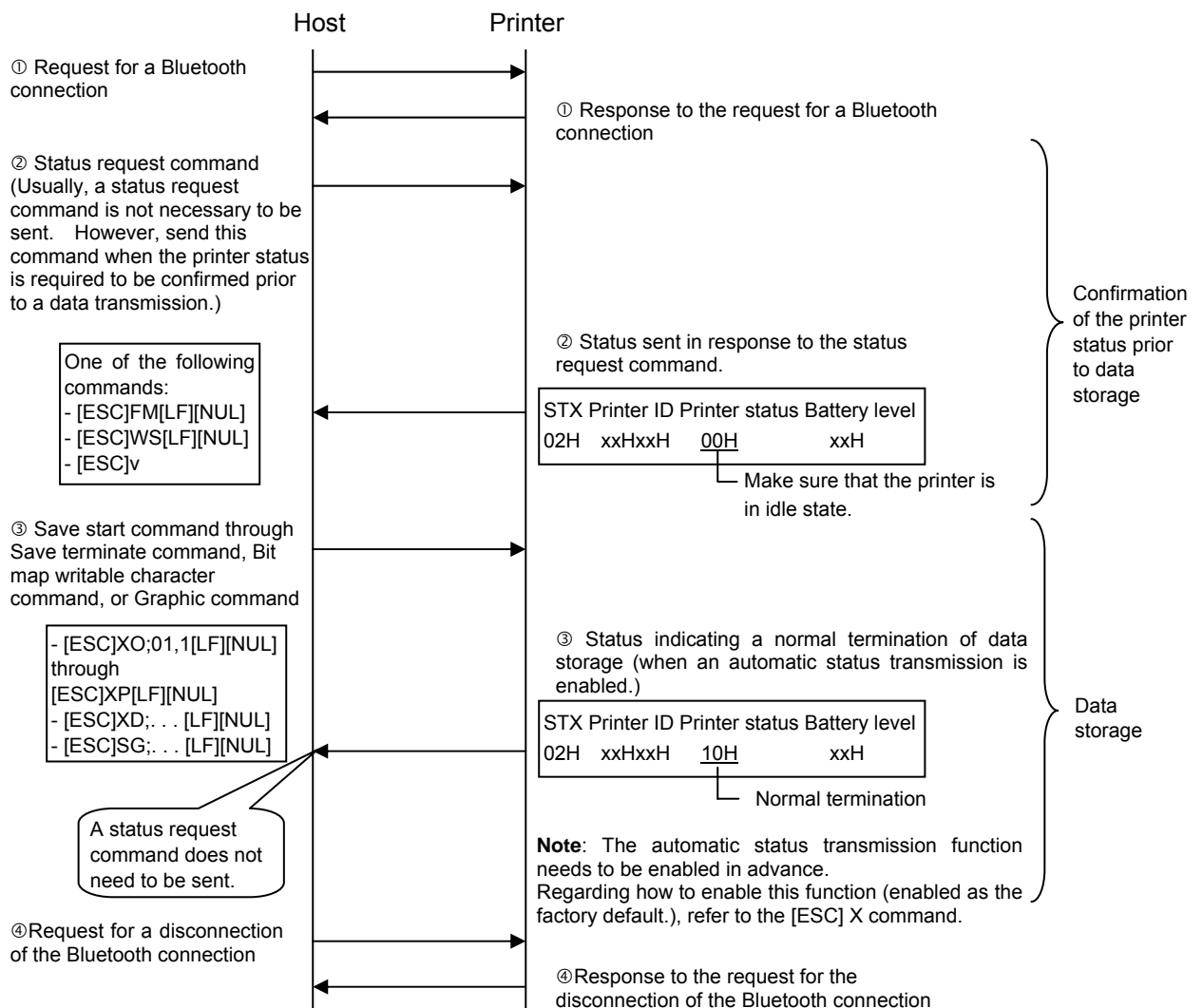
As the completion of printer operations can be confirmed, method (1) or (3) is recommended.

Method (1): Disconnecting a Bluetooth connection between the host and the printer after the completion of a print job is confirmed.

Basically, use the automatic status transmission function (this function is enabled as the factory default.) to confirm the statuses sent from the printer after printing or storing data.

This method enables confirming whether a print job is properly performed on the application. Also, an error, such as a paper end or a paper jam, on the printer can be detected by the application.

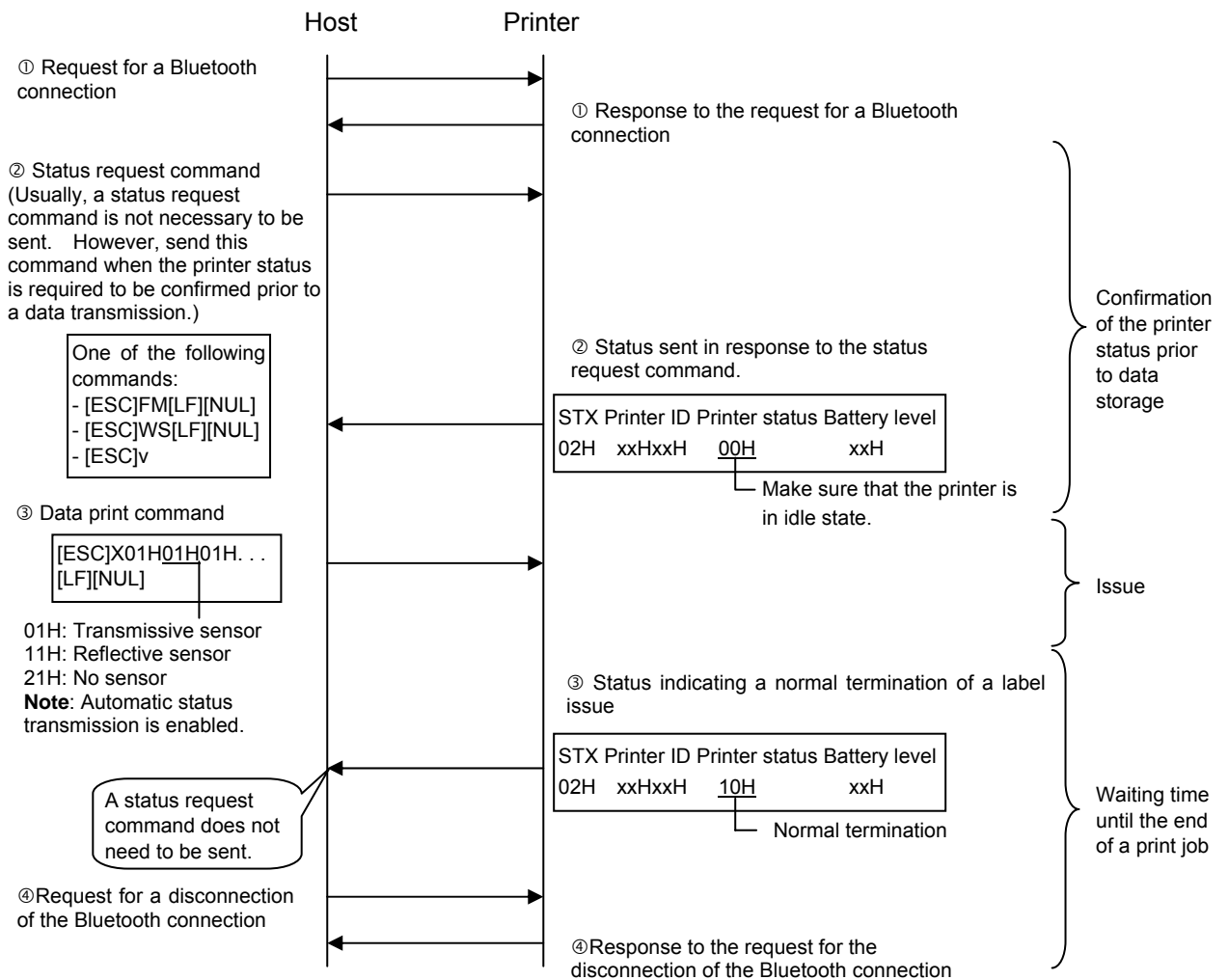
① LABEL mode (Storing forms, writable characters, or graphics)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

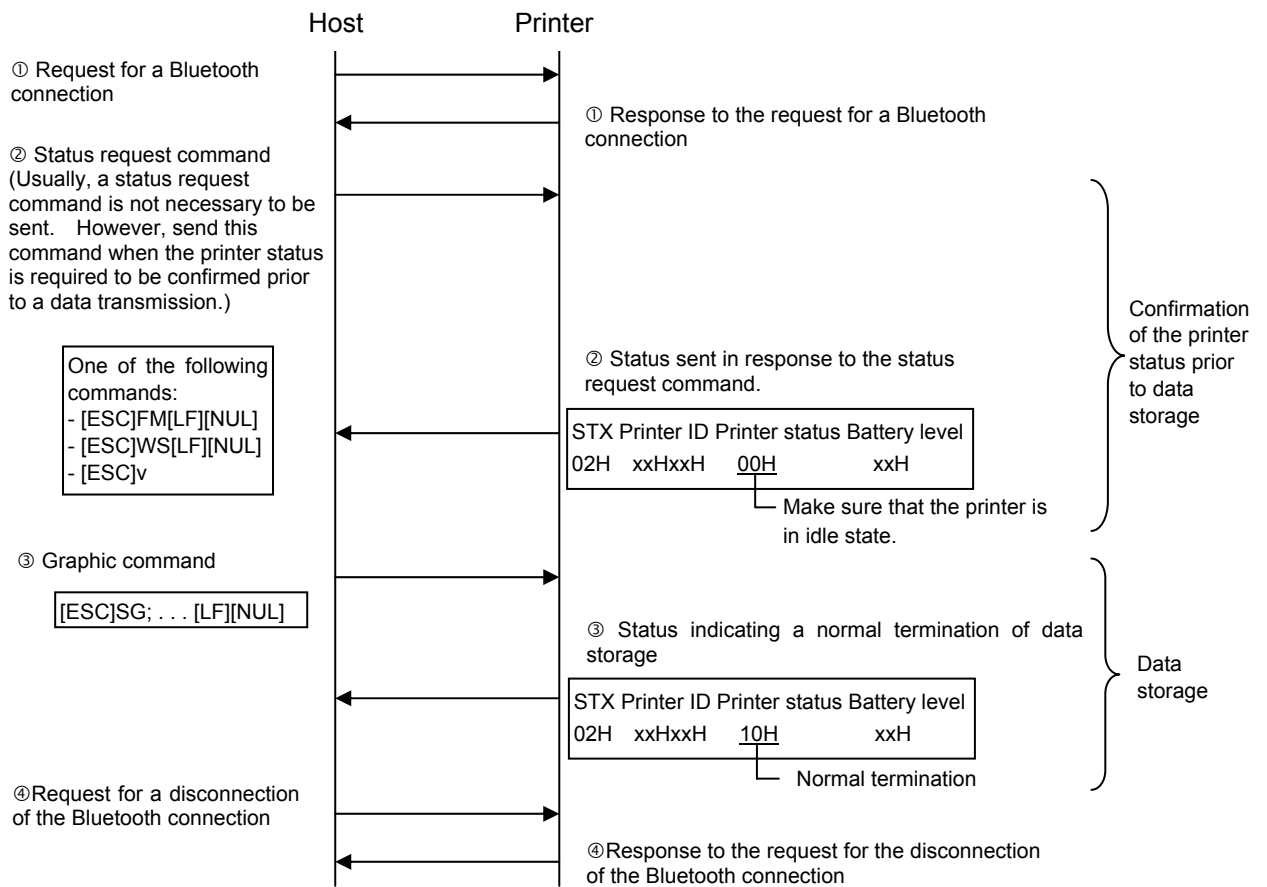
② LABEL mode (Issue)



- * The printer status can also be confirmed with the following command:
 - `[ESC] WB [LF] [NUL]`

Note that the contents of the status vary, which deserves special attention.

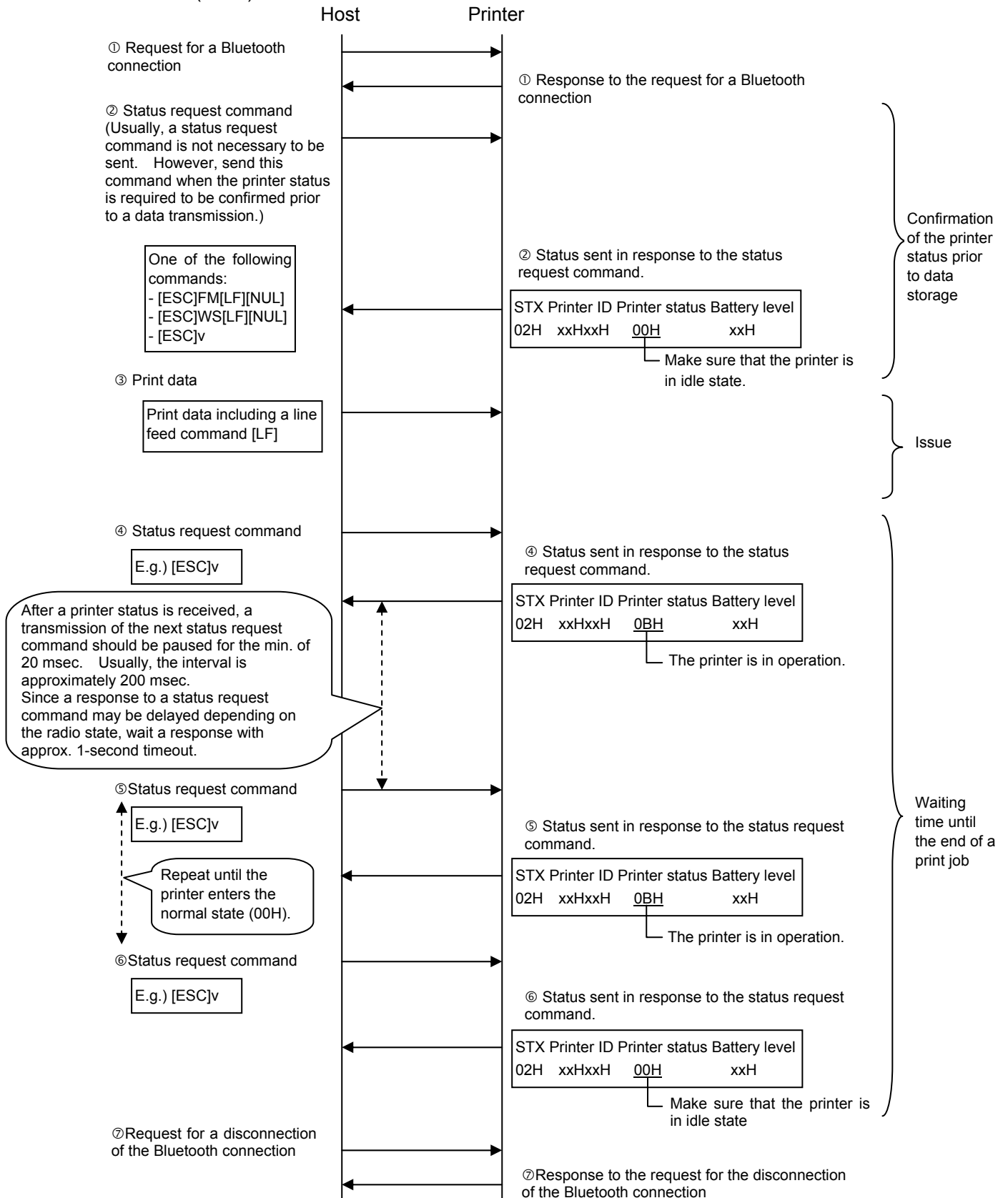
③ RECEIPT mode (Storing graphics)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

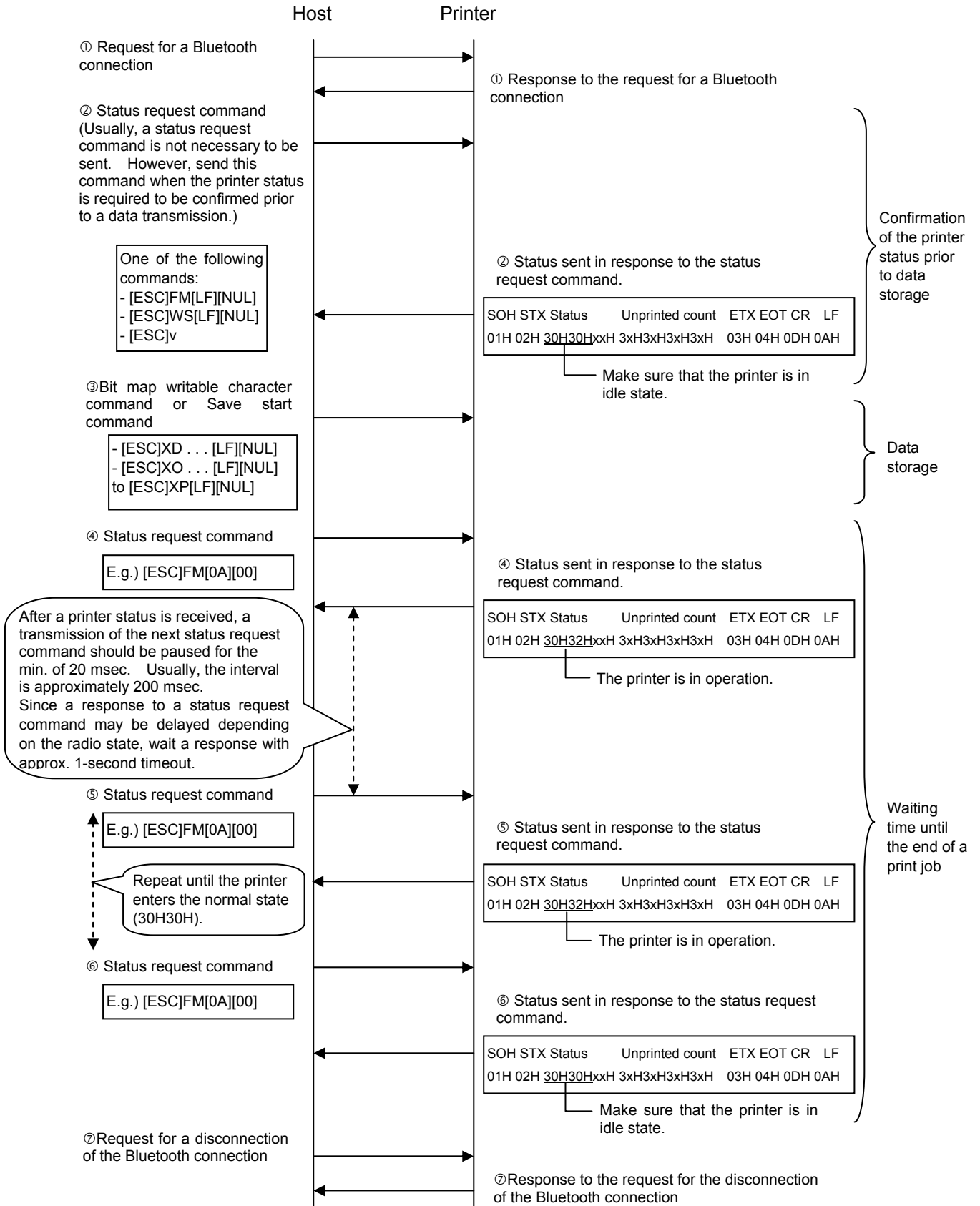
④ RECEIPT mode (Issue)



* The printer status can also be confirmed with the following command:
• [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

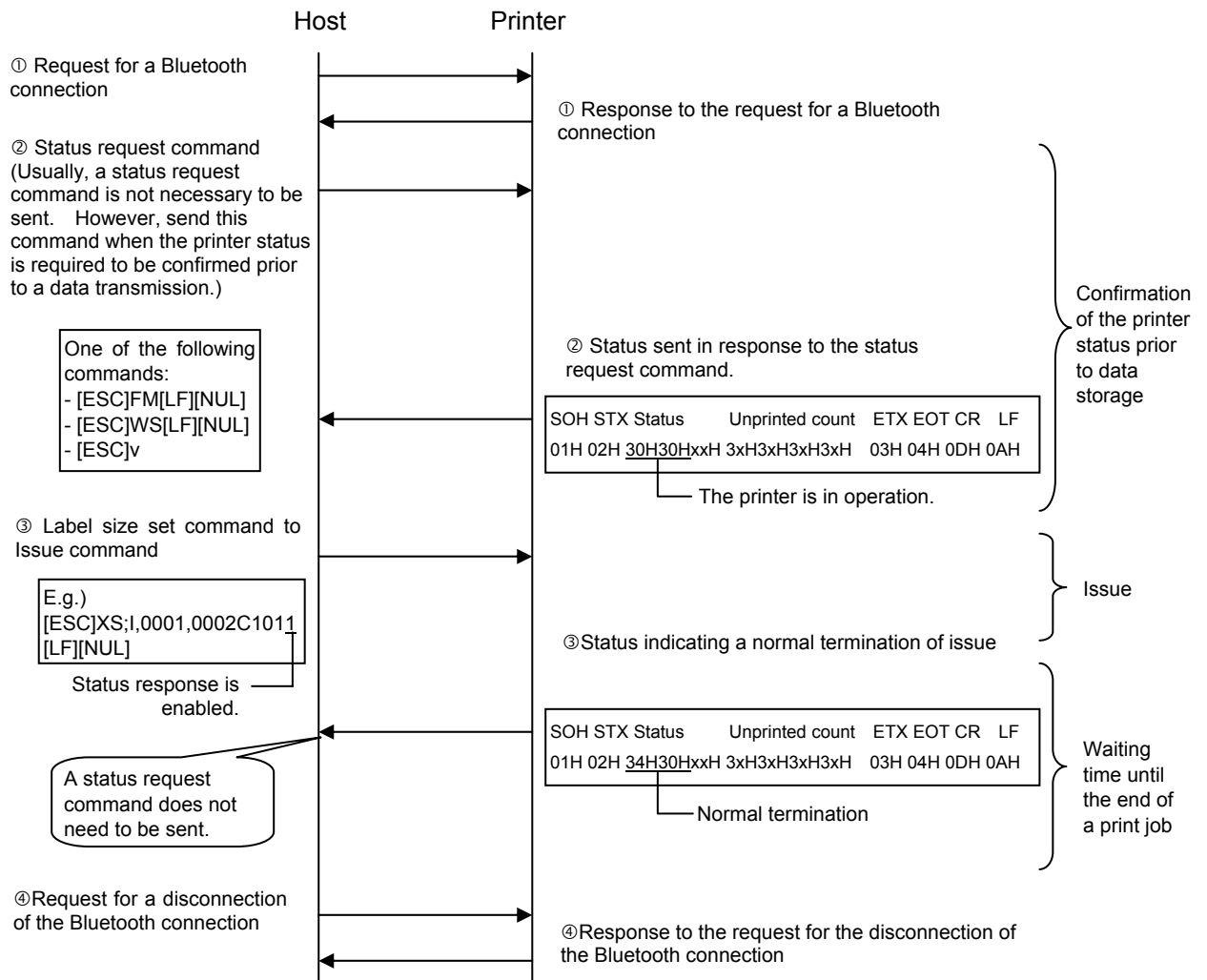
⑤ TPCL mode (Storing writable characters, PC save)



* The printer status can also be confirmed with the following command:
• [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

⑥ TPCL mode (Issue)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

Method (2): Waiting for the minimum of 100 msec. after a data transmission to the printer before disconnecting the Bluetooth connection.

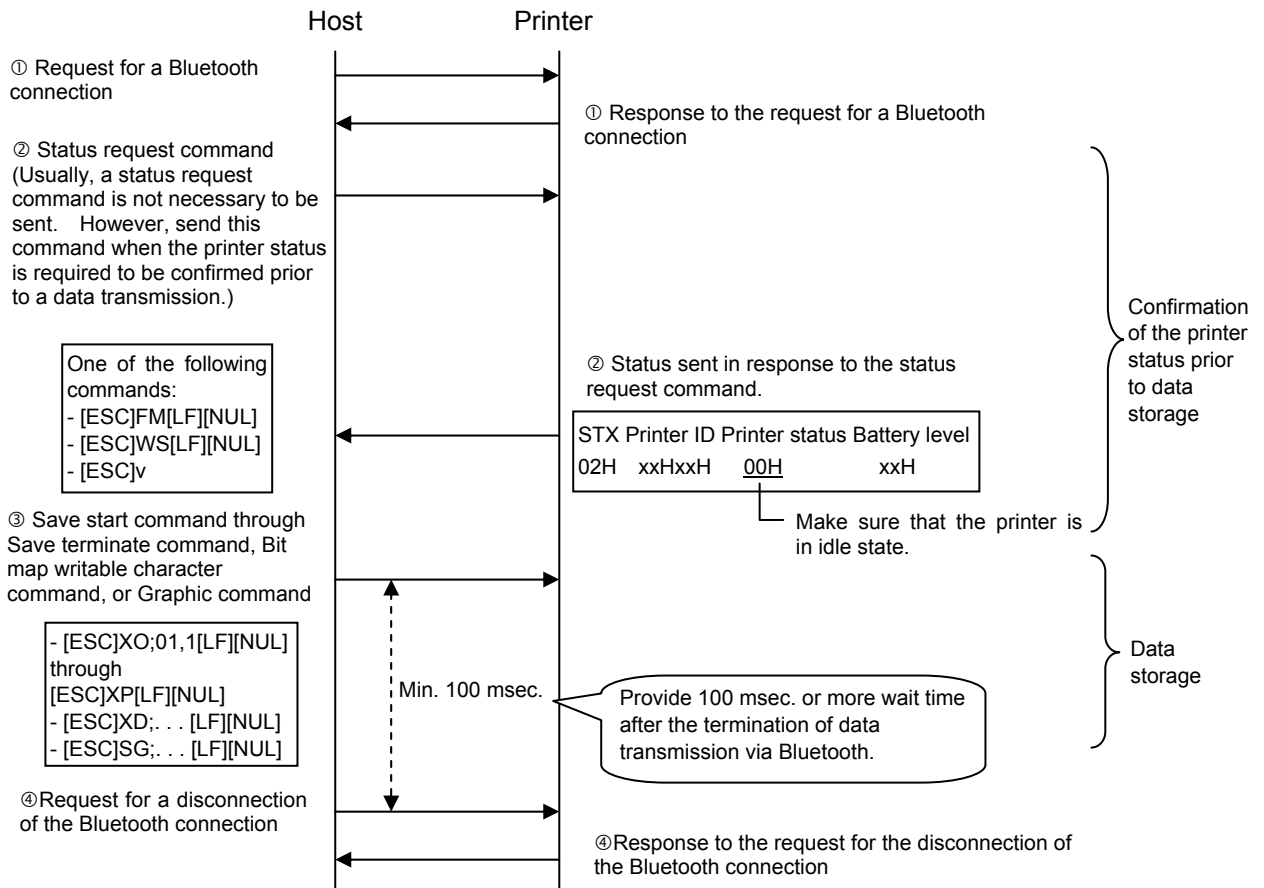
In the case that a method to confirm an end of job status, as described in Method (1), is not applicable, a minimum of 100 msec. should be provided between the last data transmission and a disconnection of Bluetooth connection to avoid an erroneous data transmission via Bluetooth.

The above mentioned 100 msec. is supposed to be counted up from the termination of a data transmission via Bluetooth (radio wave).

Some hosts may store the transmission data of the application in the buffer in the driver, then send them to the printer. In this case, care must be taken that there is time lag between the timing when the application writes data into the output function and when the data transmission is actually completed.

Thus, the time which is required to complete a data transmission should be added to 100 msec.

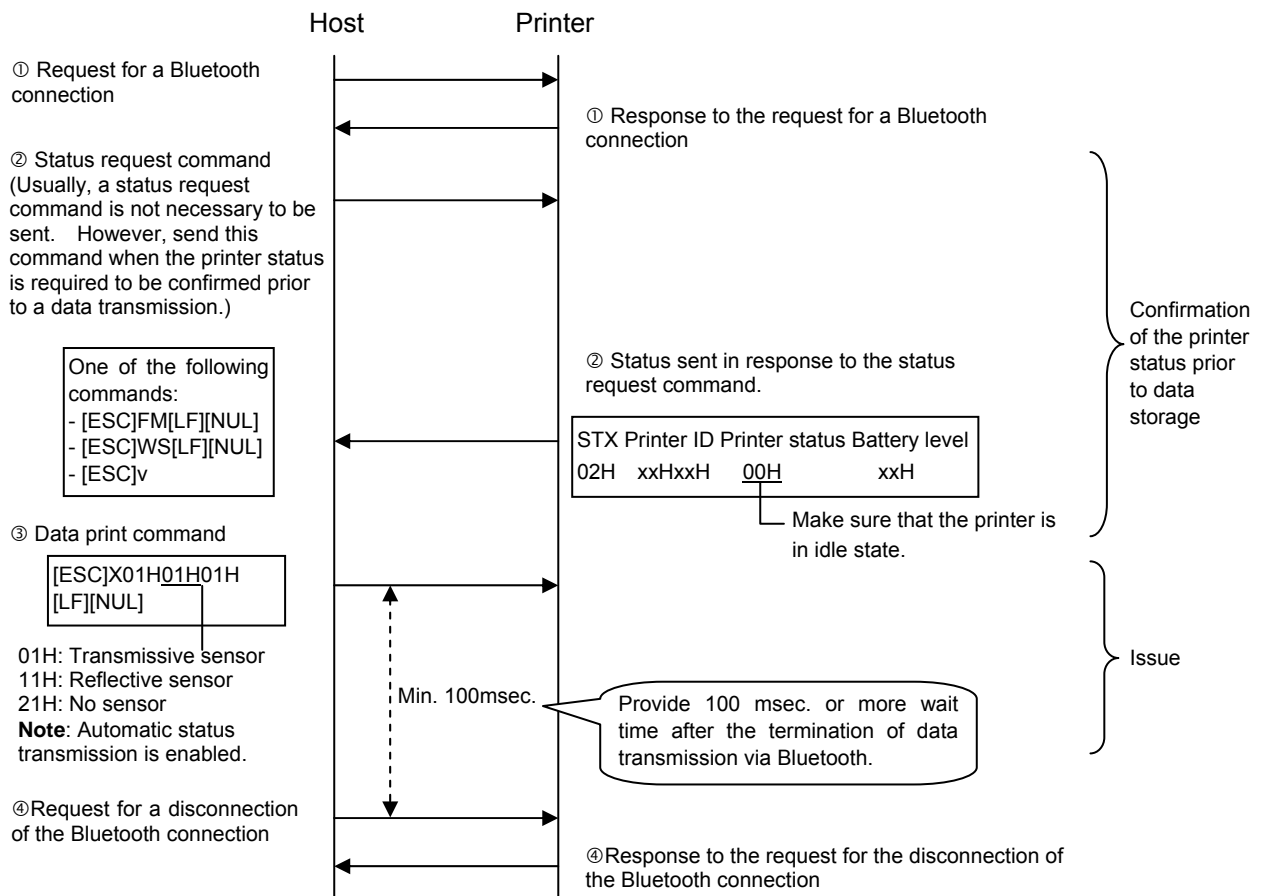
① LABEL mode (Storing forms, writable characters, or graphics)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

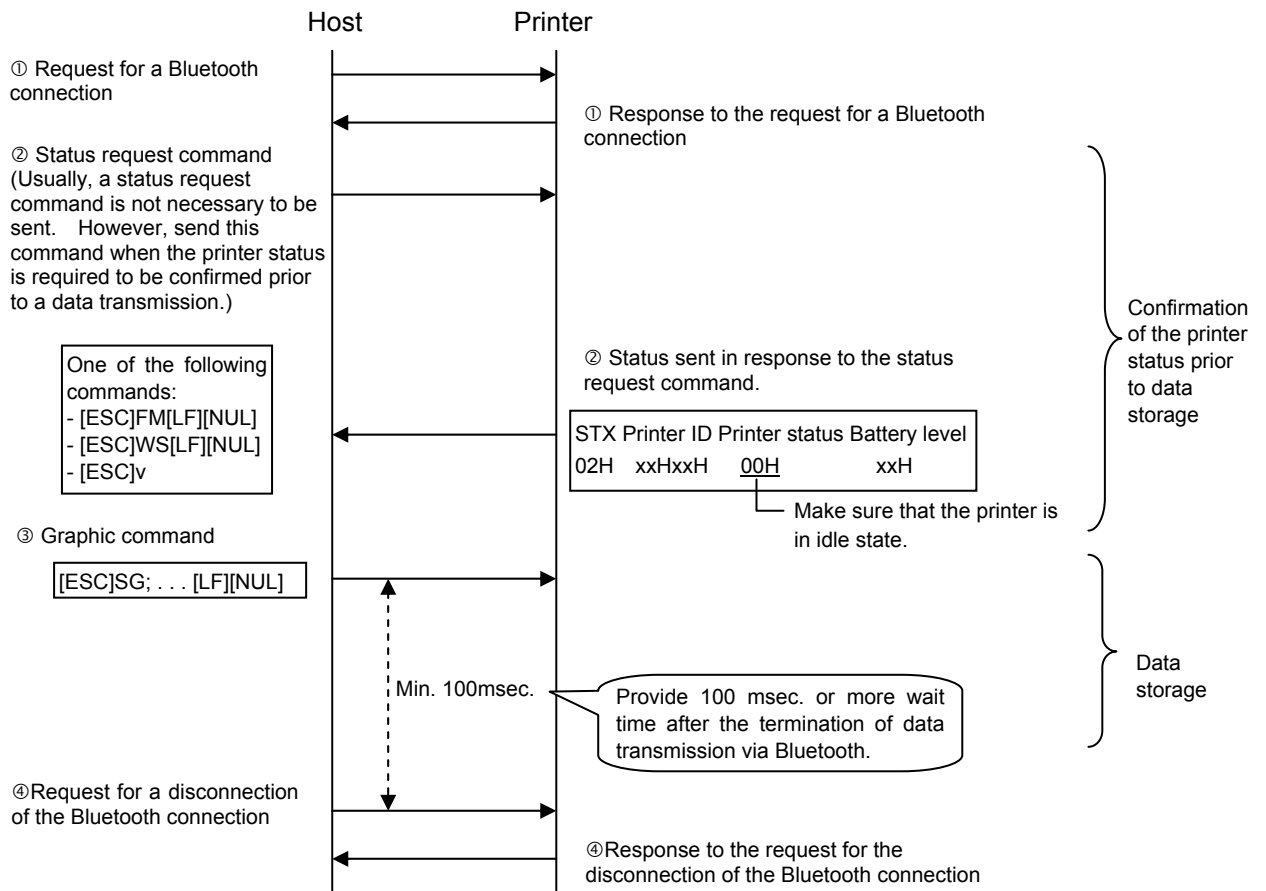
② LABEL mode (Issue)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

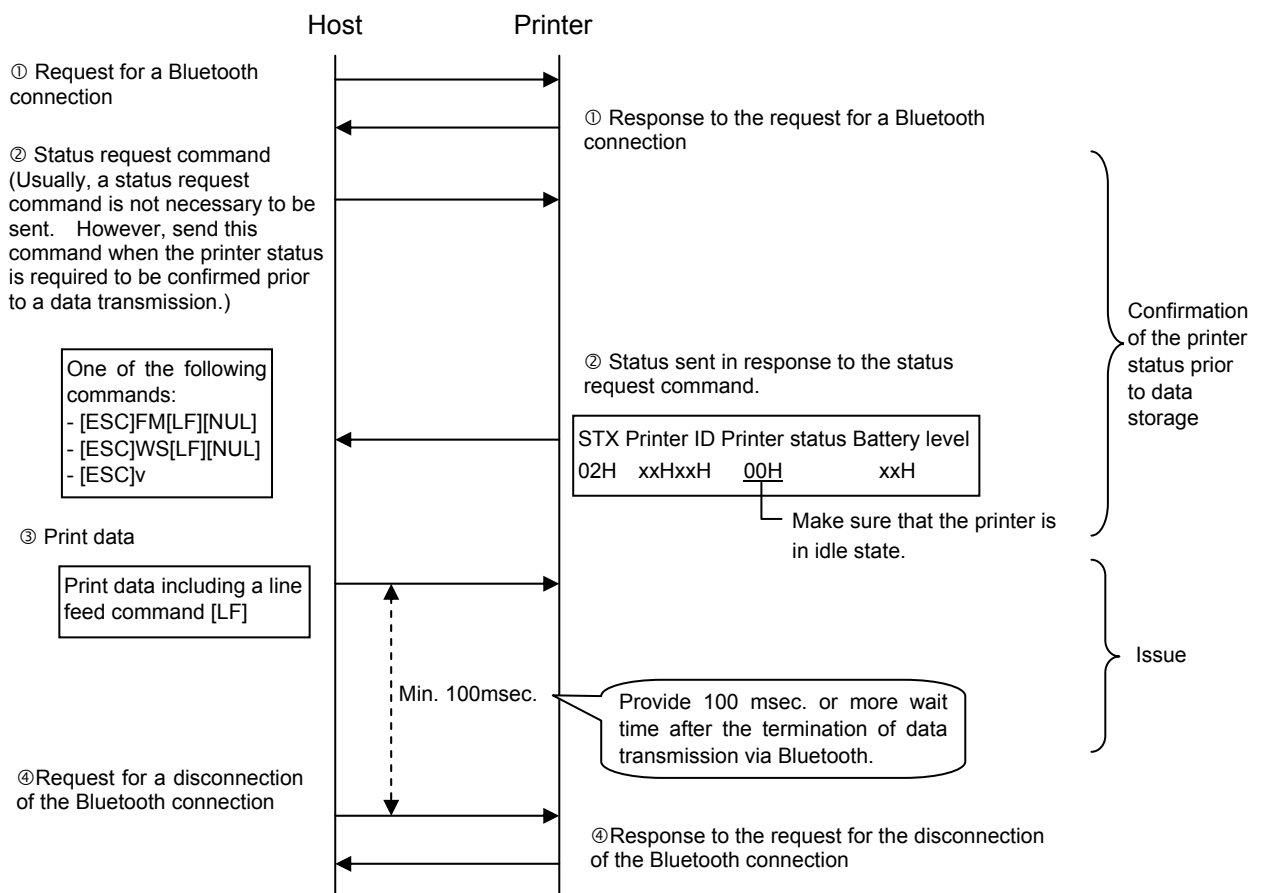
③ RECEIPT mode (Storing graphics)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

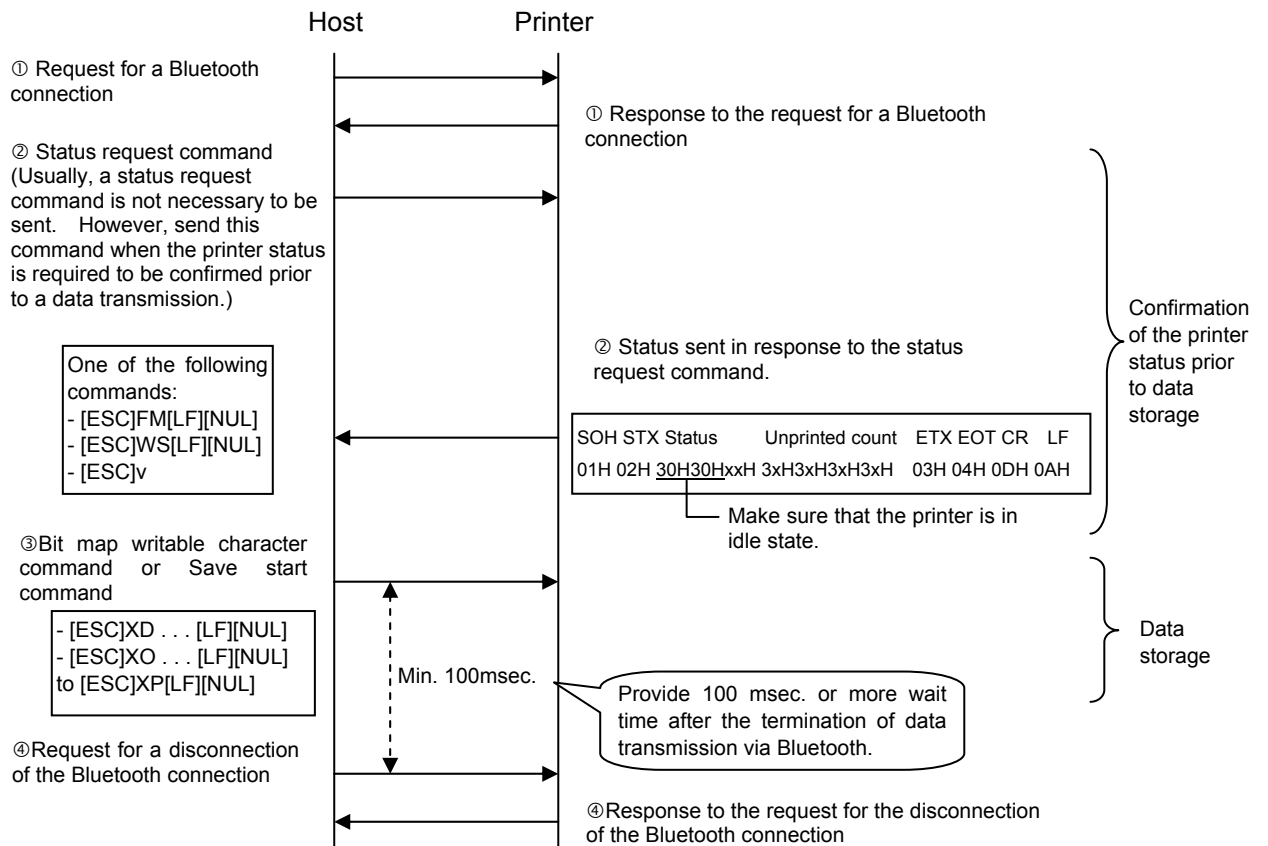
④ RECEIPT mode (Issue)



- * The printer status can also be confirmed with the following command:
- [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

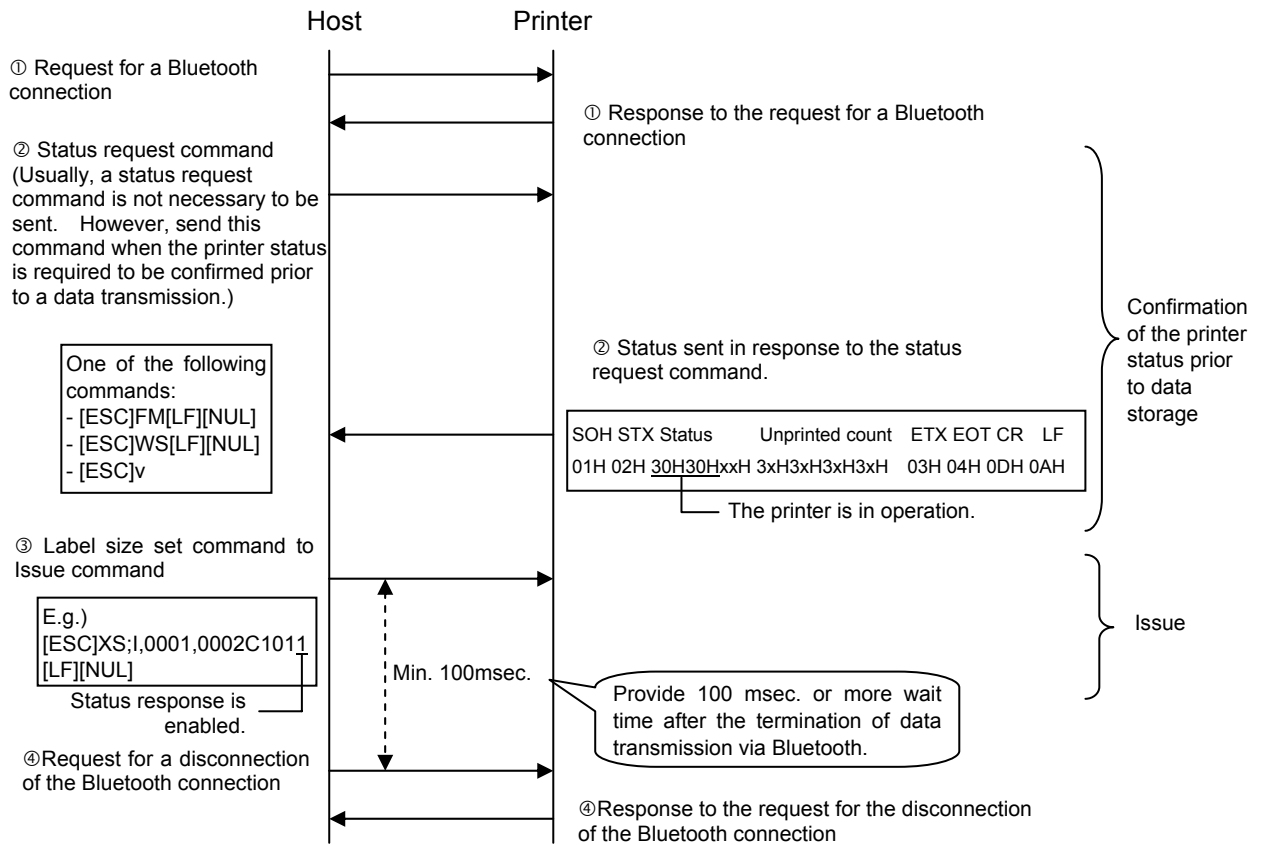
⑤ TPCL mode (Storing writable characters, PC save)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

⑥ TPCL mode (Issue)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

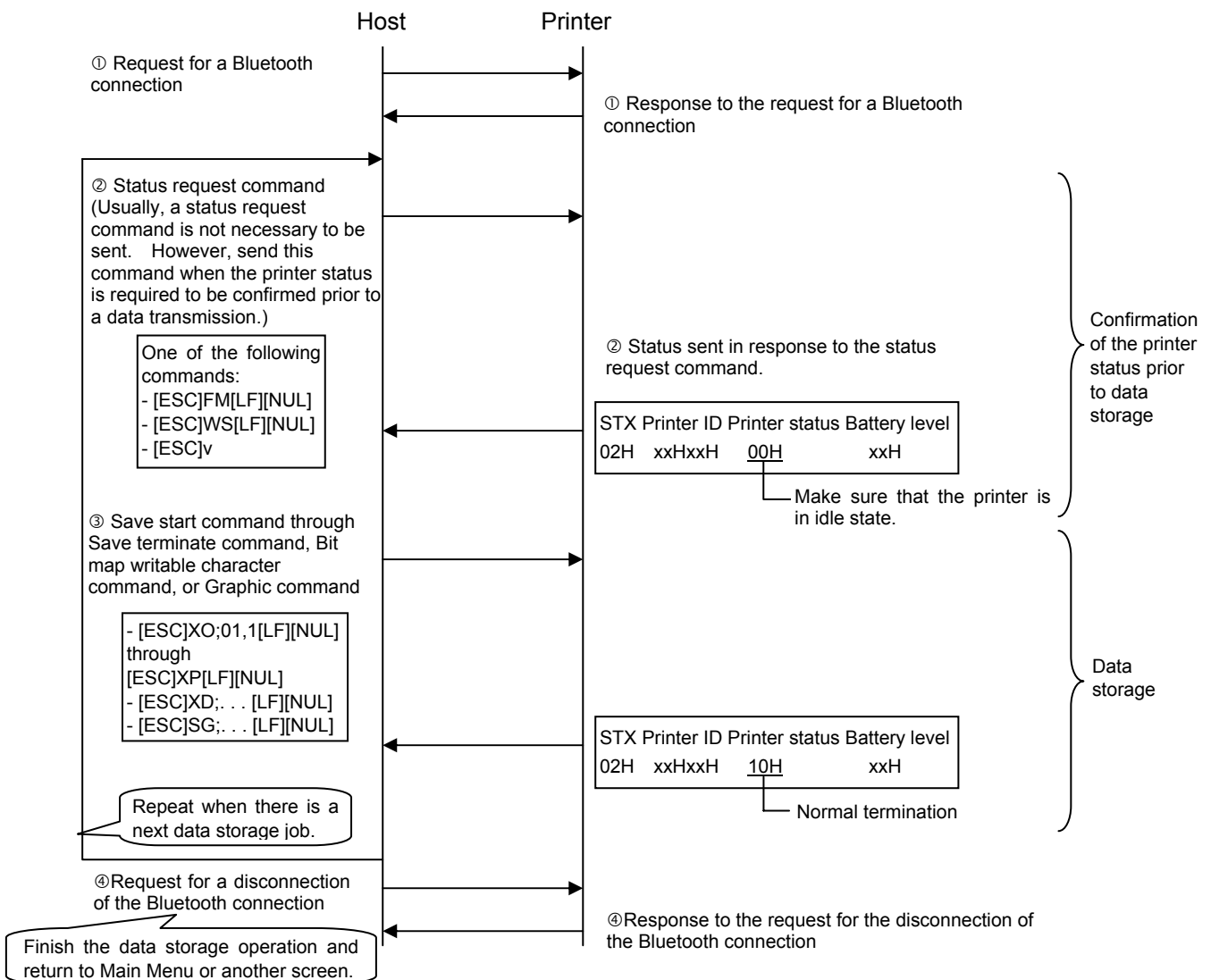
Method (3): Disconnecting the Bluetooth connection by key operations when exiting a series of print jobs.

This method improves the printing throughput of the application, as no procedures are required for establishing Bluetooth connection each time a printing occurs, which takes about 1 to 3 seconds (depending on the radio state.)

Also, maintaining the connection enables an error, such as a paper end or a paper jam, on the printer to be detected by the application. However, when more than one host shares one printer at the same time, this method is not applicable because the printer supports one-to-one connection only.

After a series of print jobs is terminated, Bluetooth connection is supposed to be disconnected at the timing of returning to the main menu by key operations. In this case, a minimum of 100 msec. should be given after all data are completely sent to the printer prior to the disconnection of Bluetooth connection.

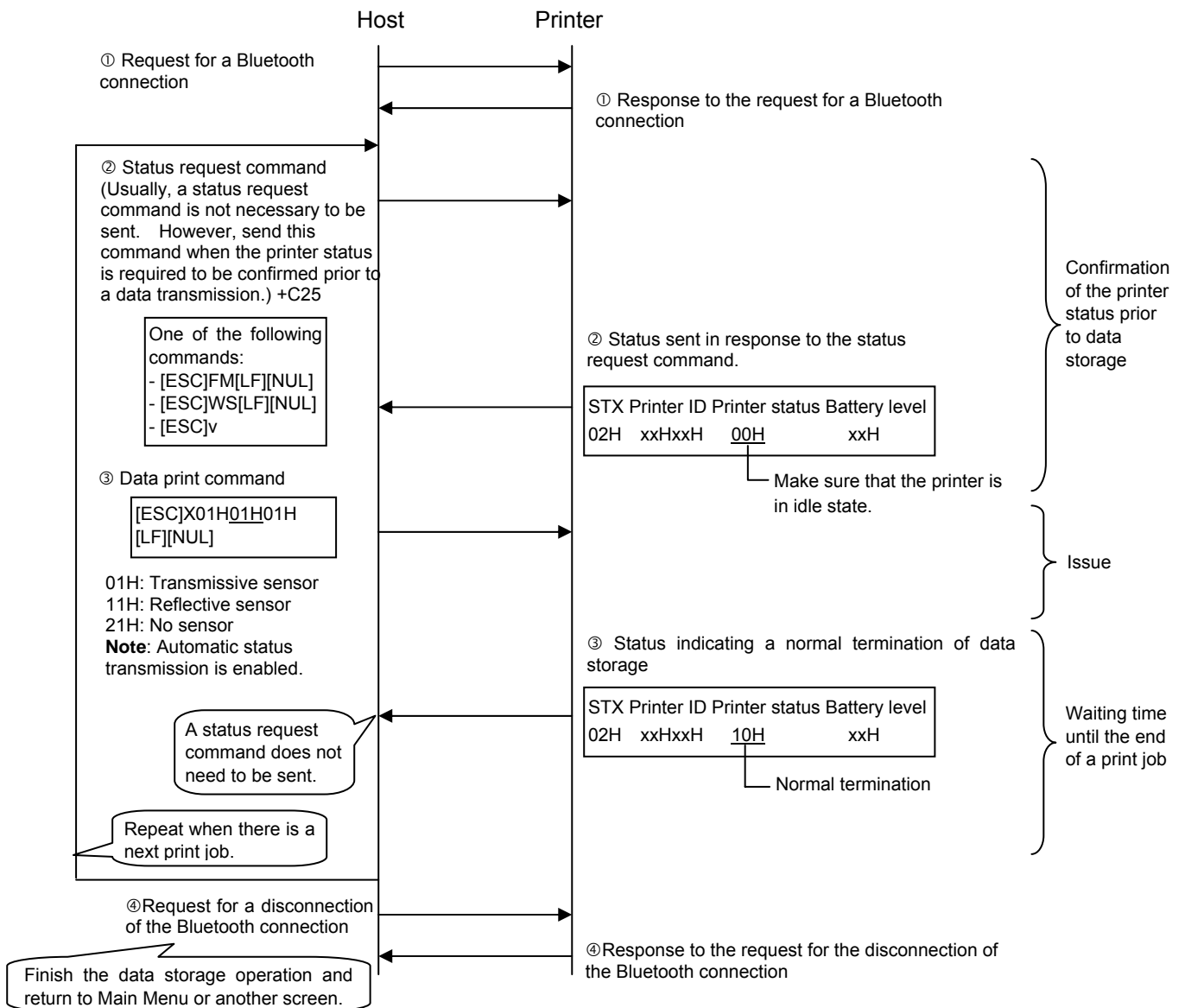
① LABEL mode (Storing forms, writable characters, or graphics)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

② LABEL mode (Issue)

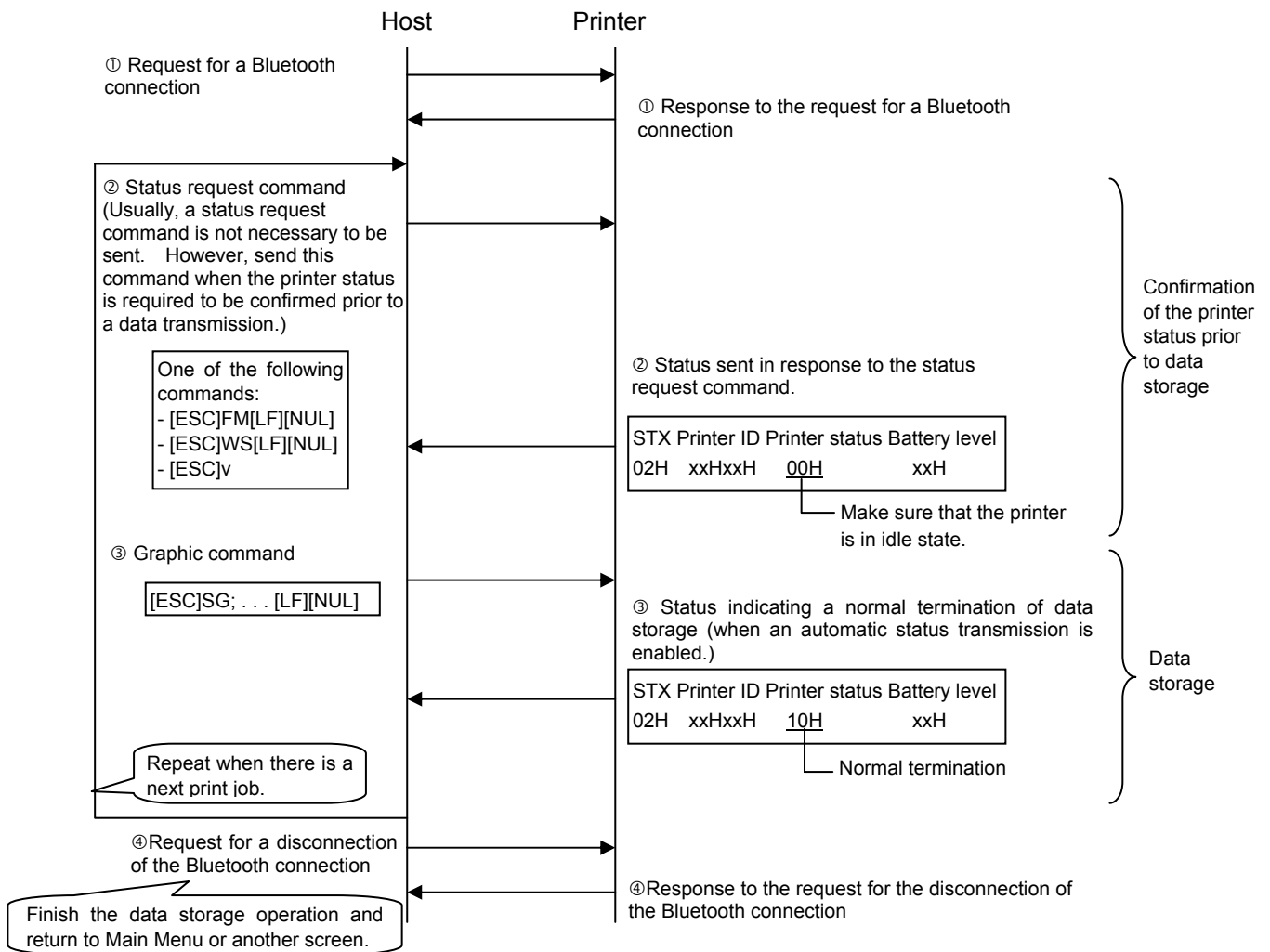


* The printer status can also be confirmed with the following command:

- [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

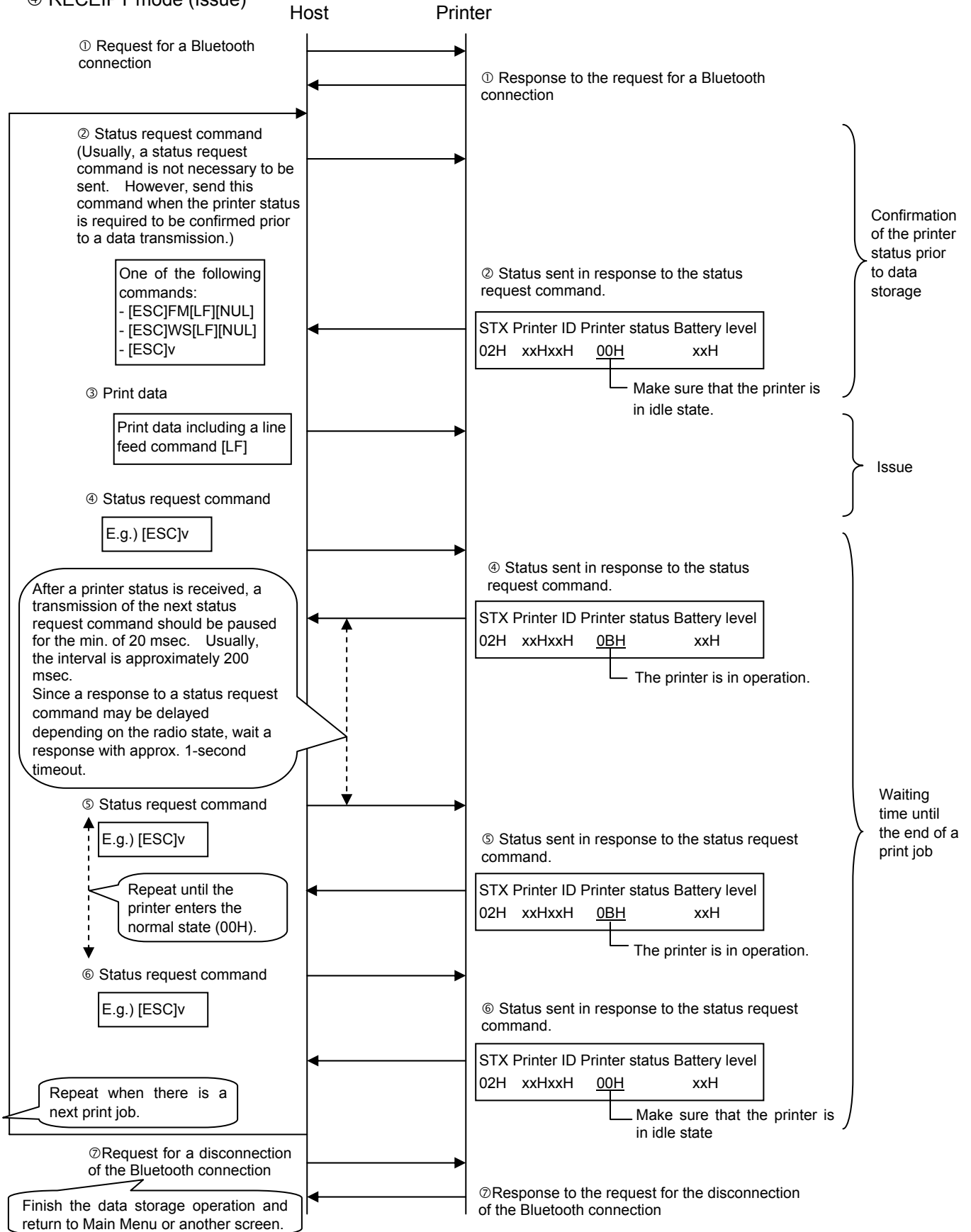
③ RECEIPT mode (Storing graphics)



- * The printer status can also be confirmed with the following command:
 - `[ESC] WB [LF] [NUL]`

Note that the contents of the status vary, which deserves special attention.

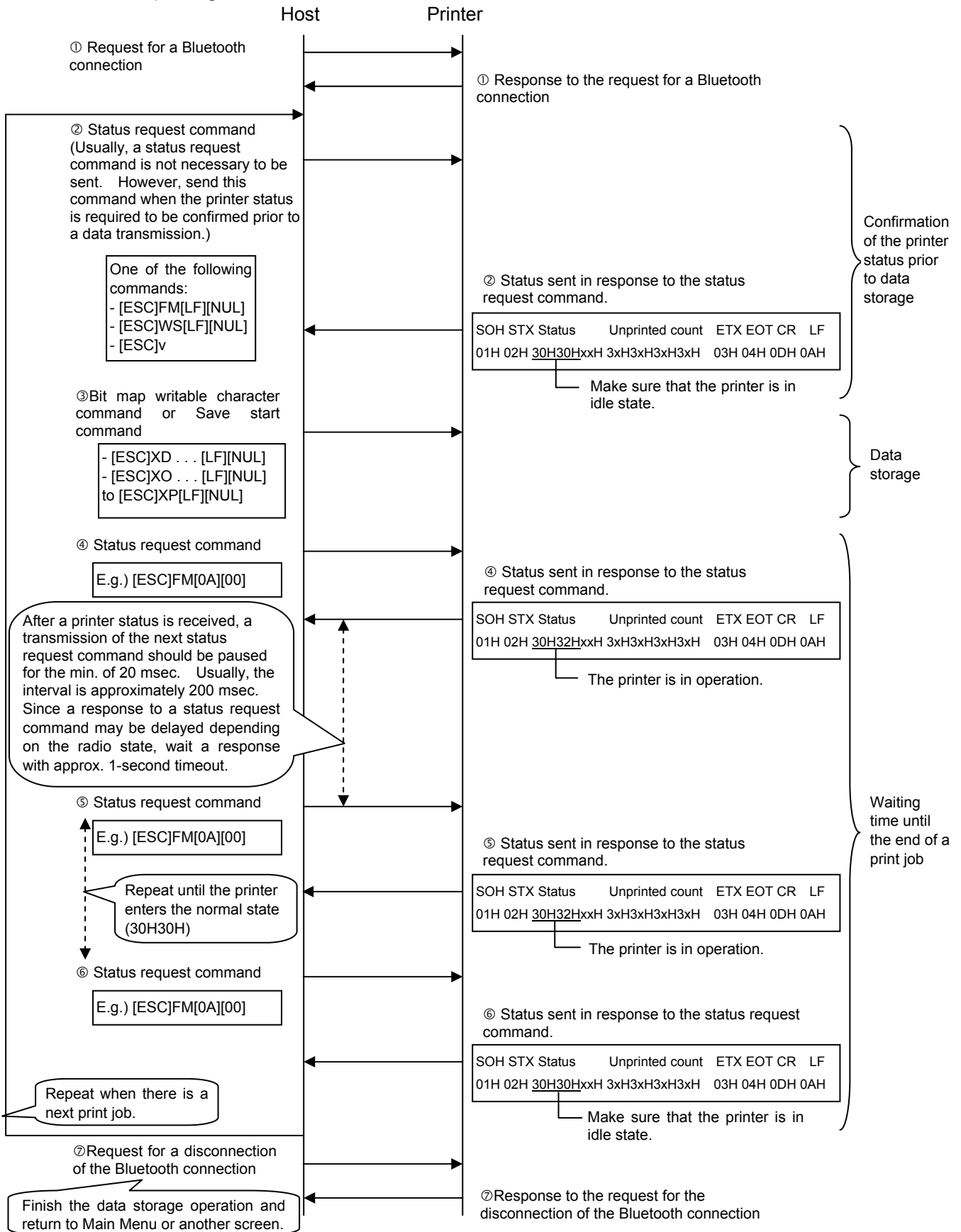
④ RECEIPT mode (Issue)



* The printer status can also be confirmed with the following command:
• [ESC] WB [LF] [NUL]

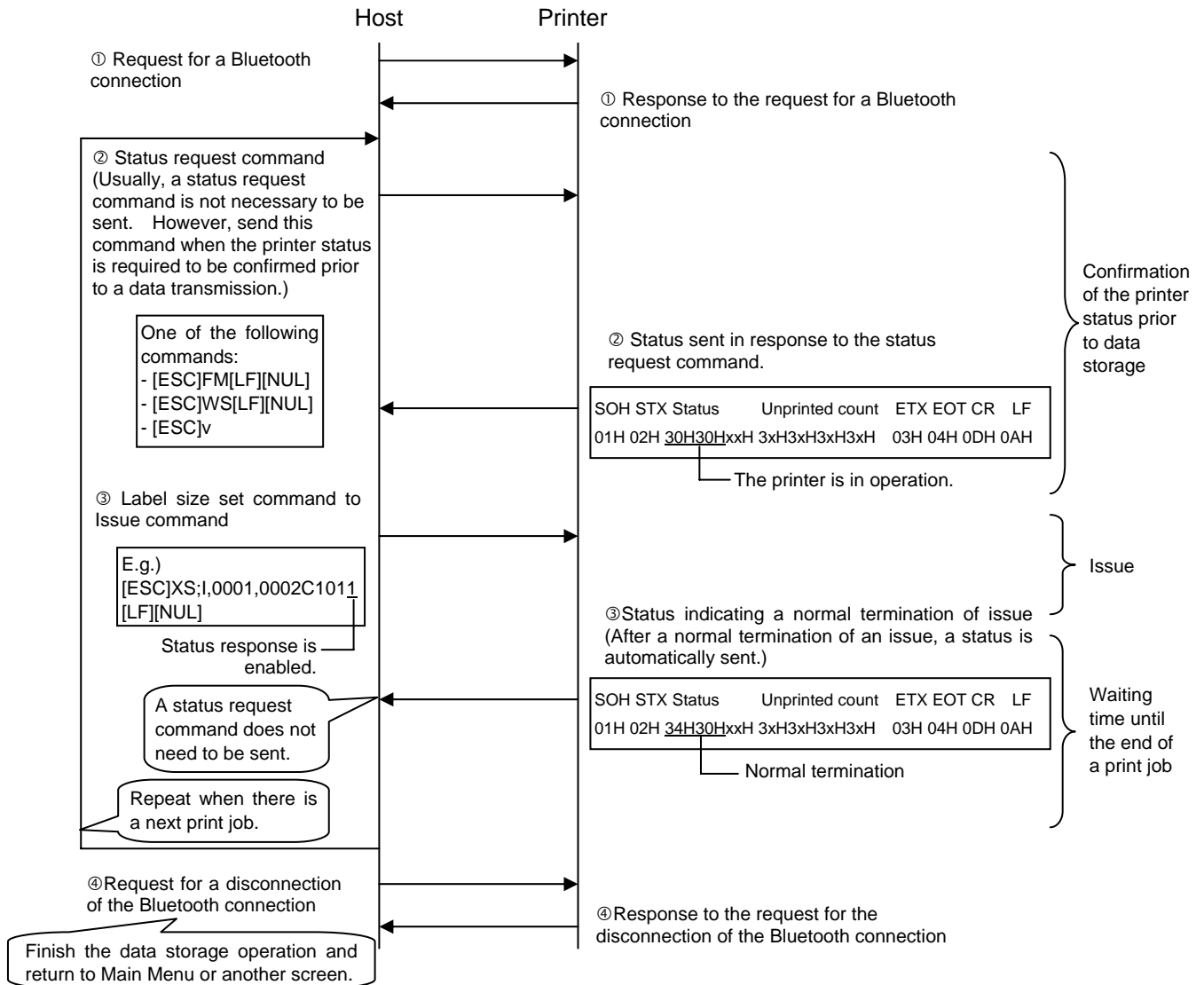
Note that the contents of the status vary, which deserves special attention.

⑤ TPCL mode (Storing writable characters, PC save)



* The printer status can also be confirmed with the following command:

⑥ TPCL mode (Issue)



- * The printer status can also be confirmed with the following command:
 - [ESC] WB [LF] [NUL]

Note that the contents of the status vary, which deserves special attention.

3.7.4 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE

Data is left in the received buffer until reception is stopped and a timeout occurs (power save mode) because the received buffer has not been initialized.

3.7.5 COMBINATION OF BLUETOOTH MODEL AND APPLICABLE FIRMWARE VERSION

The following table shows the combination of the Bluetooth model and applicable firmware version.

Firmware version	B-EP-GH30/TH30	B-EP-GH32
V1.3B or before	Applicable	Not applicable (BT INIT ERROR occurs.)
V2.0 or later	Applicable	Applicable

3.8 WIRELESS LAN INTERFACE

3.8.1 OUTLINED SPECIFICATIONS

Supported standard	IEEE 802.11b/g	
Communication distance	100 m/360° (Depending on conditions)	
Client protocol	Physical layer	802.11b/g
	Data link layer	CSMA/CA
	Network layer	IP, ICMP, ARP
	Transport layer	TCP, UDP
	Application layer	SOCKET, LPR, SNMP agent DHCP client, Web server, WINS client
Flow control	TCP/IP flow control	
Antenna	Built-in	
Parameter setting	Via USB	
Parameter status monitoring	Via HTTP	

3.8.2 MAC ADDRESS

When the wireless LAN module has been installed on the printer, the printer prints the MAC address and wireless LAN module's parameter settings.

[MAC address]

The MAC address is printed on the self-test result in the SYSTEM mode.

[Parameter settings]

Various parameters are printed by holding down the [POWER] switch (for 3 seconds or more after a message "ON LINE" is displayed on the LCD) at a power ON time.

For details, see the Key Operation Specifications.

3.8.3 CONNECTION SEQUENCE

For the printer connection setting, the connection sequence varies according to the wireless mode.

3.8.3.1 INFRASTRUCTURE MODE (ESS)

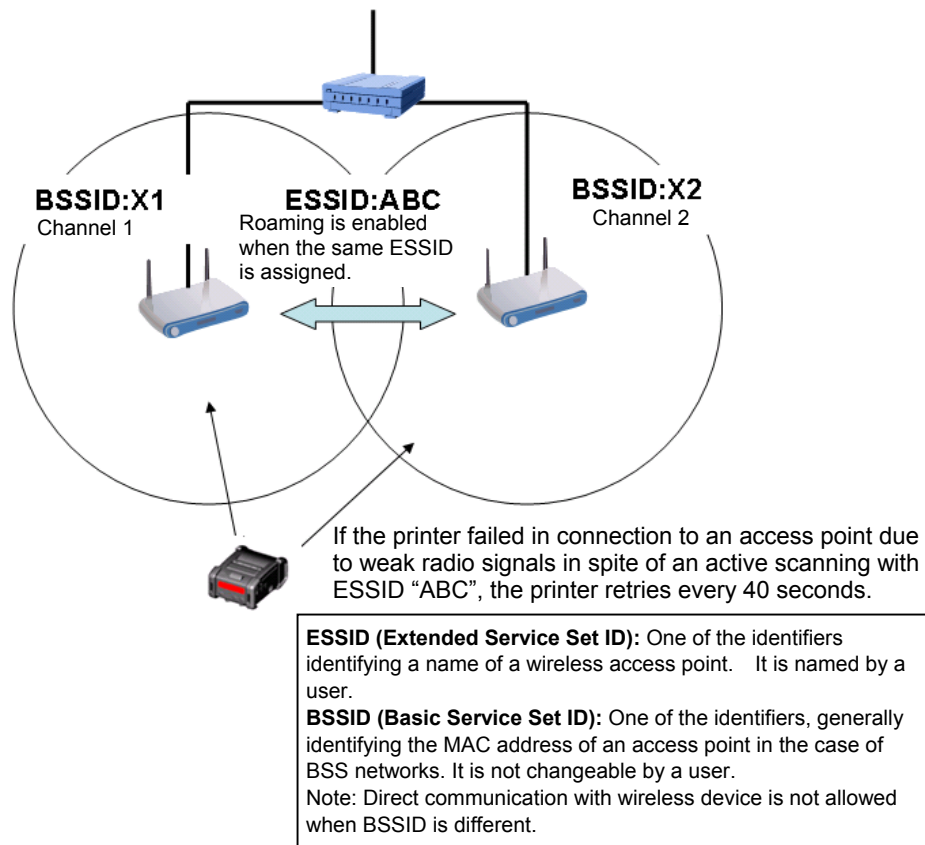
The printer performs active scanning using an ESSID, which a user set in advance, for all the channels that it supports at a power ON time. When receiving a valid active scanning response from the access point, the printer enters the connection state.

The channel set at the access point is used.

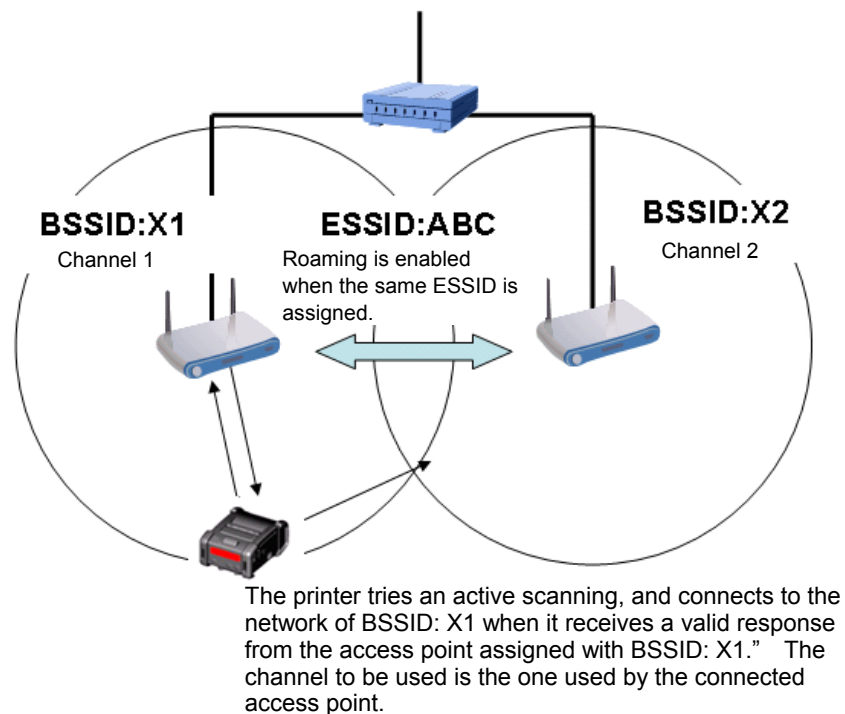
The printer out of the connection state repeats active scanning every 40 seconds until it enters the connection state.

If the printer comes into a situation where it cannot receive the beacon from the access point for a specified period of time after the connection due to weaker radio signals or other factors, the printer goes out of the connection state. In this case, just as at a power ON time, the printer waits for 40 seconds and then performs active scanning every 40 seconds until it becomes connected again. This operation continues at maximum of two hours.

If Supplicant is used, the 802.1x authentication is performed when the printer tries to connect to an access point (Authenticator). (The timing is different depending on the authentication method and access point specification.)



(a) Example: Active scanning retry



(b) Example: Continuously successful connection

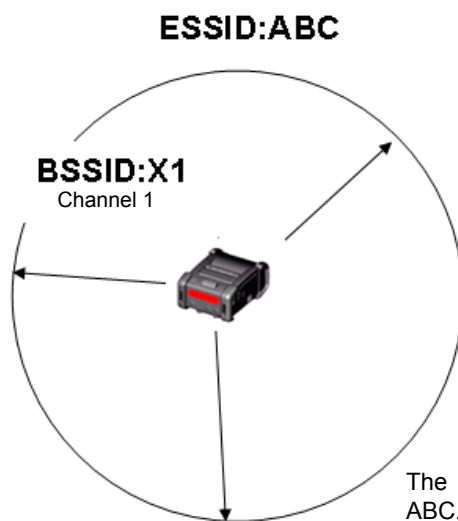
3.8.3.2 ADHOC MODE (IBSS)

The printer performs active scanning using an ESSID, which a user set in advance, for all the channels that it supports at a power ON time. When receiving a valid active scanning response from the IBSS creator, the printer connects to the network as a joiner. The channel set at the IBSS creator is used.

If the printer can receive no valid active scanning response after active scanning for all the channels for approximately 3.5 seconds, the printer becomes the IBSS creator and creates own BSS (a network having a unique BSSID) for the channel specified for the printer.

The above operation enables a group of remotely-located wireless LAN clients (printers, handy terminals, etc.) to share the same ESSID as well as each client of the group to become a different network having unique BSSID. Since a communication is not allowed with the network having different BSSID, wireless devices used in pairs are required to try connection within a near area to avoid joining the network with different BSSID.

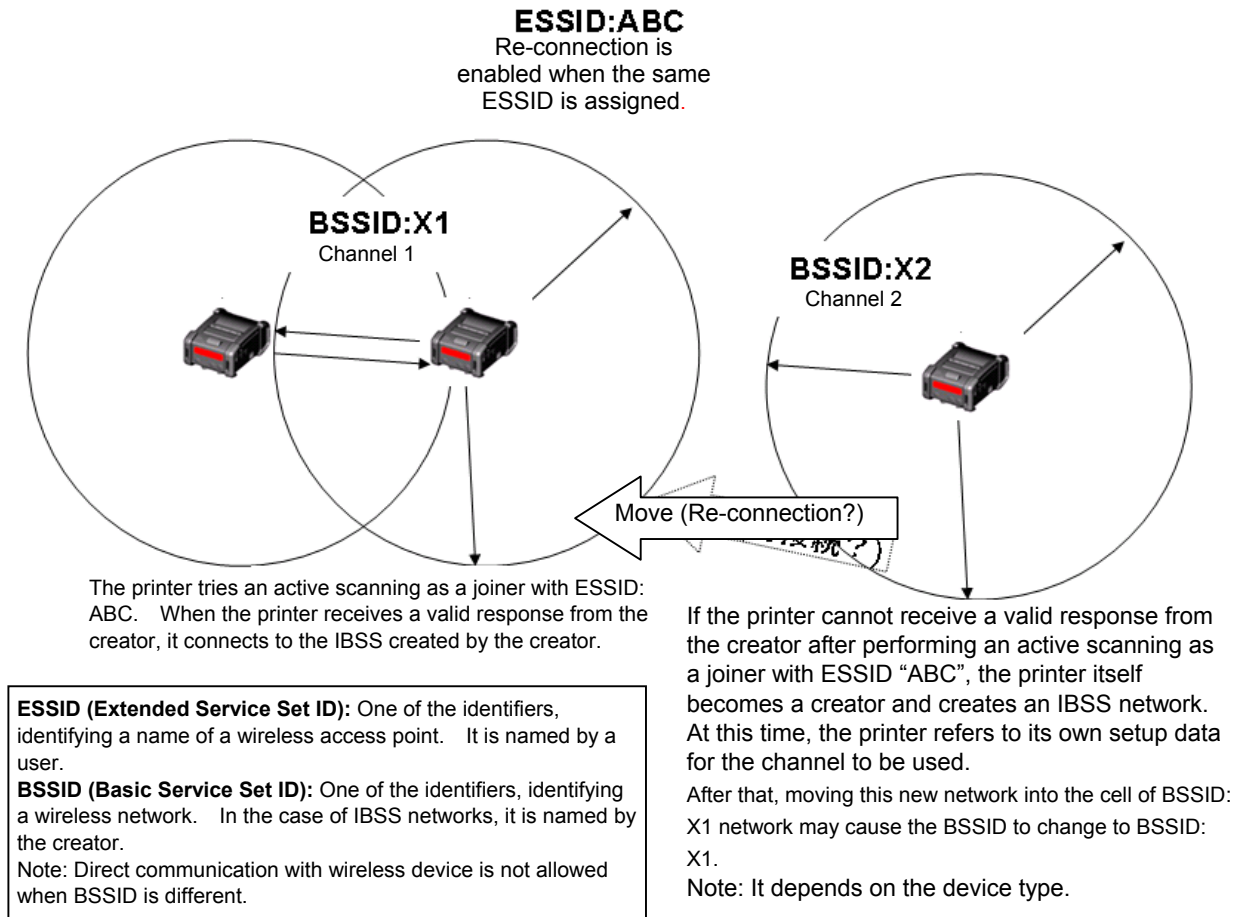
When the printer detects that there is a network having different BSSID but the same ESSID or the IBSS creator exited from the network during periodic IBSS network monitoring, it tries re-connection to an optimum IBSS network. At this time, a connection may become unstable temporarily.



ESSID (Extended Service Set ID): One of the identifiers, identifying a name of a wireless access point. It is named by a user.
BSSID (Basic Service Set ID): One of the identifiers, identifying a wireless network. In the case of IBSS networks, it is named by the creator.
 Note: Direct communication with wireless device is not allowed when BSSID is different.

The printer tries an active scanning as a joiner with ESSID: ABC. When the printer cannot receive a valid response from the creator, it becomes a creator and creates an IBSS network. At this time, the printer refers to its own setup data for the channel to be used.

(a) Example: Joiner becomes creator



(a) Example: Dynamic change of IBSS network

3.8.4 HANDLING OF RECEIVED DATA WHEN THE PRINTER GOES INTO POWER SAVE MODE

Data is left in the received buffer until reception is stopped and a timeout occurs (power save mode) because the received buffer has not been initialized.

4. TRANSMISSION SEQUENCE

4.1 GENERAL DESCRIPTION

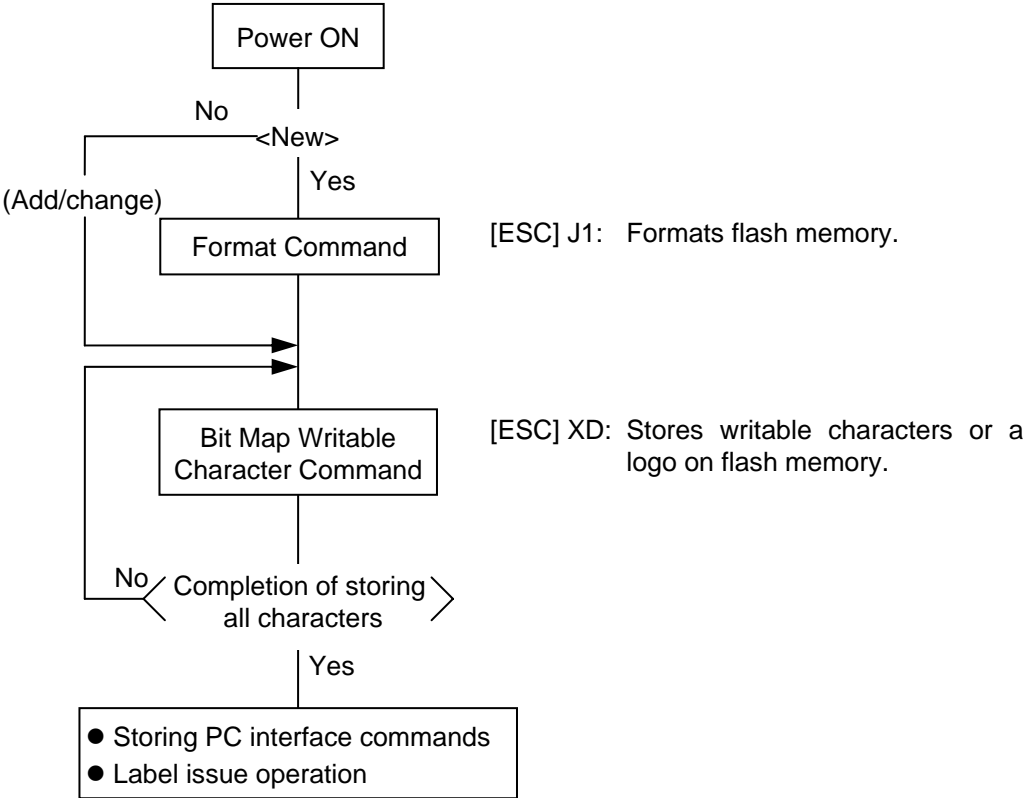
This section describes details regarding the transmission sequence between the host and the printer.

4.2 TPCL MODE

4.2.1 INITIAL SETTING

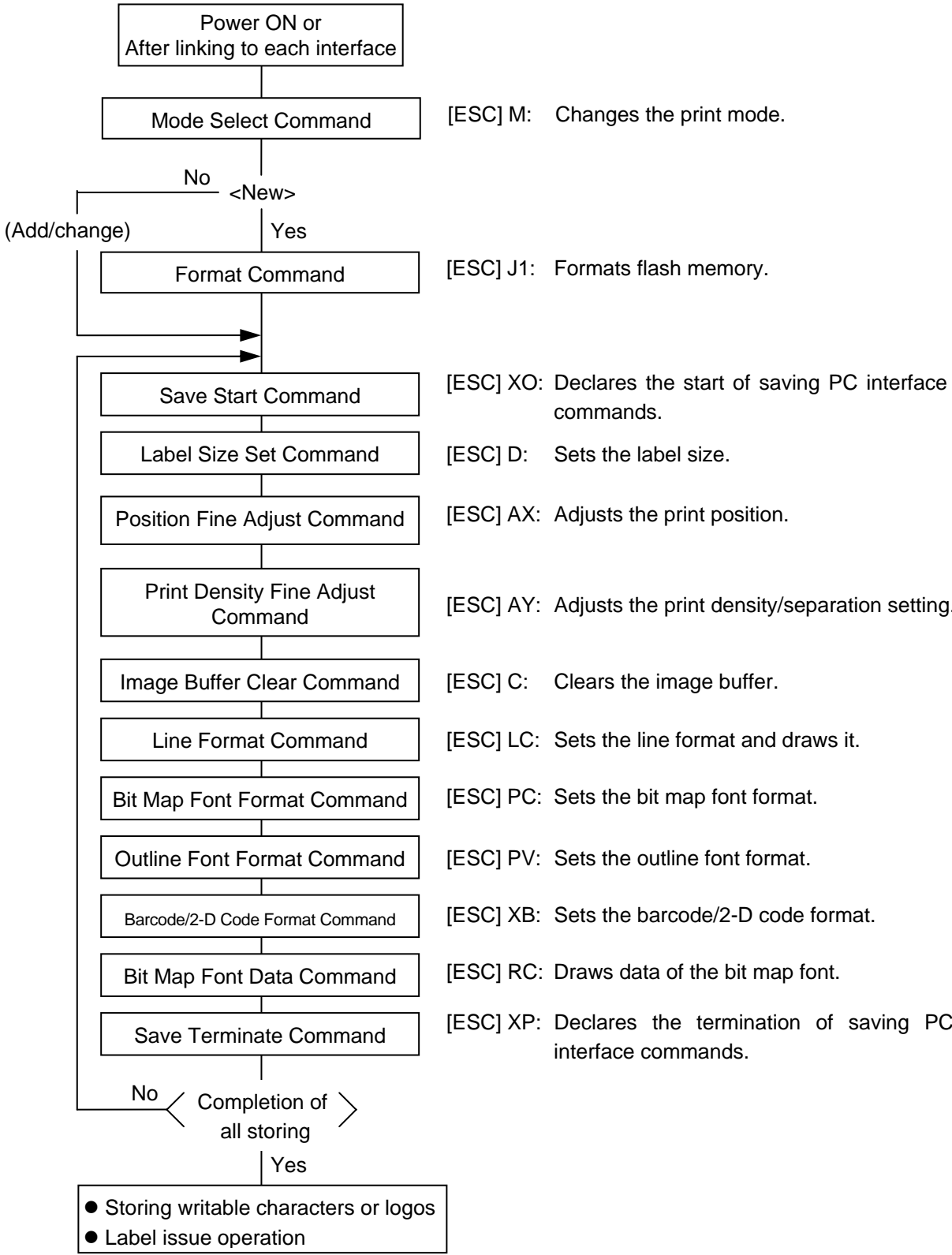
Writable characters, logo, and PC interface commands must be stored, before the label issue operation.

(1) Storing writable characters and logos



- NOTES:**
- (1) The storage of writable characters or logos is only performed if it is required.
 - (2) When the Format Command is not sent before storing a writable character or a logo with the same number as the already stored writable character or logo, memory will be used with each storing.
 - (3) Performing other operations (storing PC interface commands and label issue operation) after storing writable characters or logos automatically clears the image buffer.
 - (4) If the storage operation is not continued after storing writable characters or logos, the printer enters the on-line mode (label issue operation) after approx. 1.6 seconds. At the same time, the image buffer is automatically cleared.

(2) Storing PC interface commands

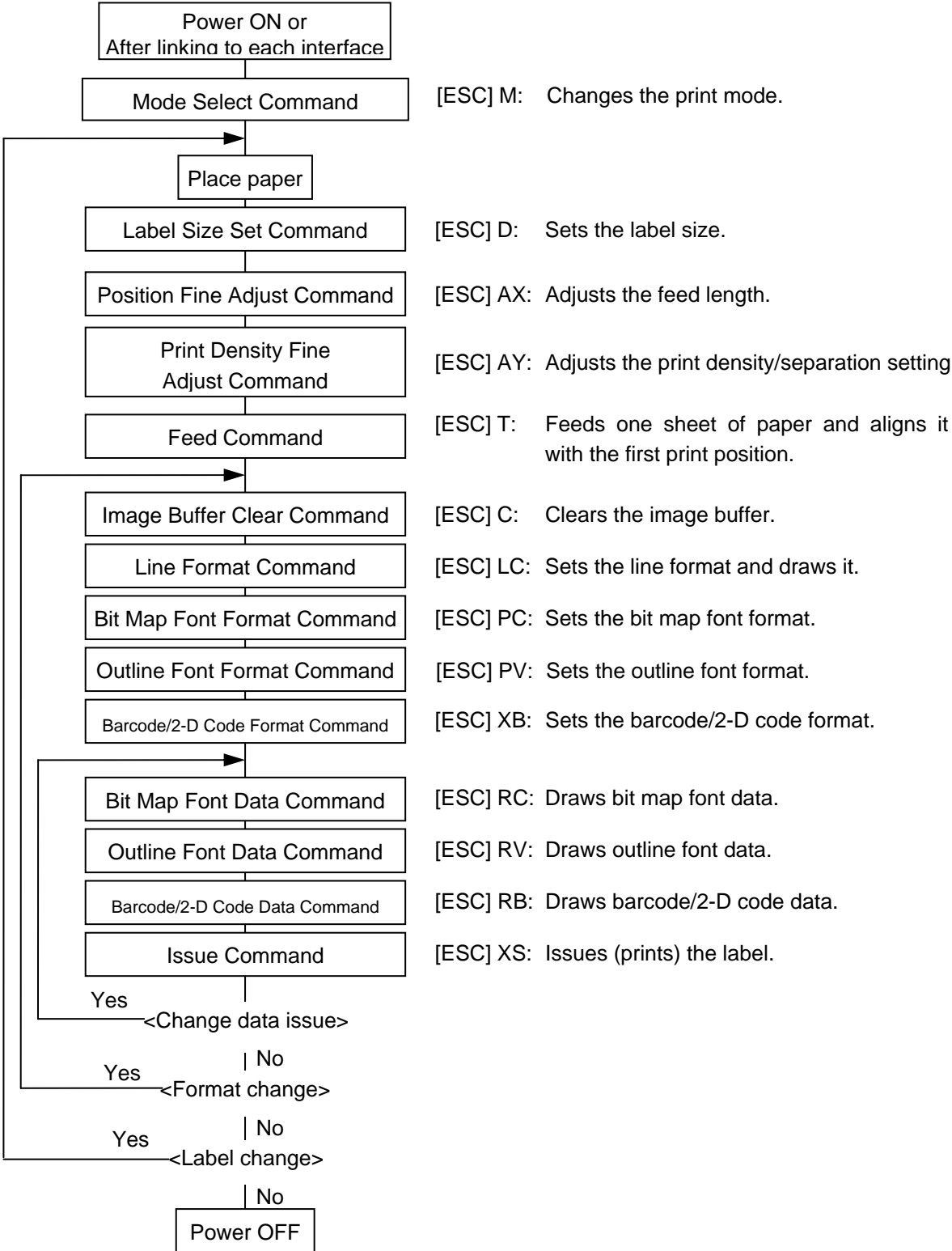


- NOTES:**
- (1) The storage of PC commands is only performed if it is required.
 - (2) When the Format Command is not sent before storing the PC interface command with the same number as the already stored PC command, memory will be used with each storing.
 - (3) Performing other operations (storing PC interface commands and label issue operation) after storing writable characters or logos automatically clears the image buffer.
 - (4) Select commands to be stored as the occasion arises.

4.2.2 LABEL ISSUE OPERATION

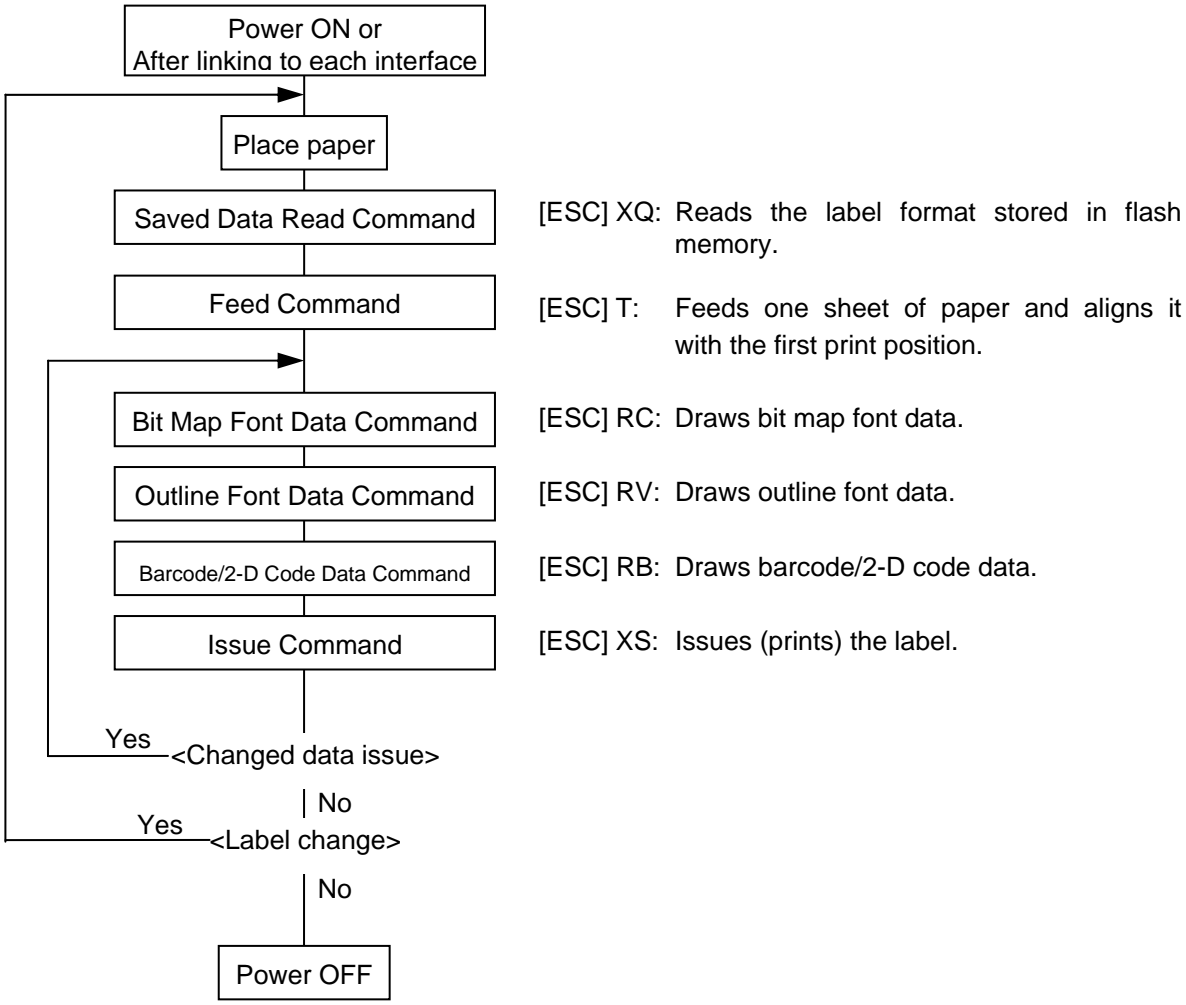
An example of the label issue operation is described below.

(1) Where the Saved Data Read Command is not used:



- NOTES:** (1) The Label Size Set Command must be sent.
 (2) After the power is turned off then on, the Bit Map Font Format Command, the Outline Font Format Command, and the Barcode/Two-dimensional Code Format Command should be sent as the occasion arises, because they are not protected in memory.

(2) Where the Saved Data Read Command is used:



- NOTES:**
- (1) The Feed Command can be omitted if the same sheet is used before Power OFF and after Power ON.
 - (2) The Saved Data Read Command can be omitted after the power is turned OFF and then ON if the command is set as [Automatic read after Power ON: Enabled].
 - (3) When XML data is used:
The XML format can be used for transmitting print data to the printer.
- (*) For details, see the XML Specifications.

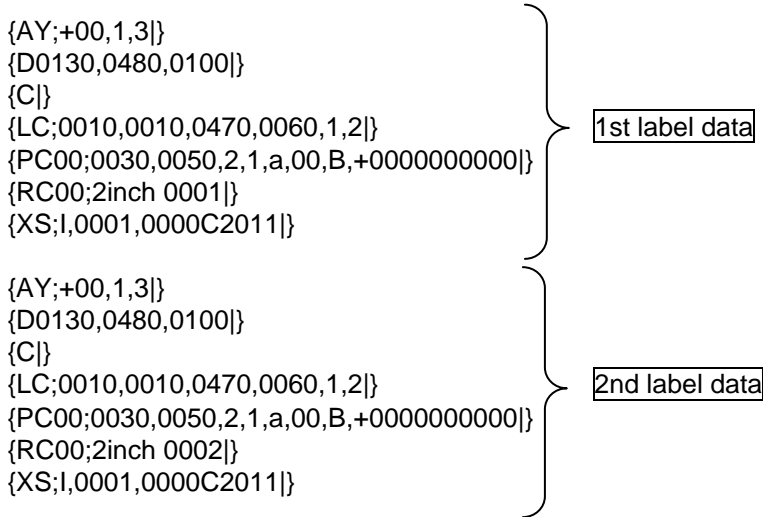
4.2.3 HANDLING OF RECEIVED DATA BY COMMAND

4.2.3.1 BIT MAP FONT FORMAT COMMAND

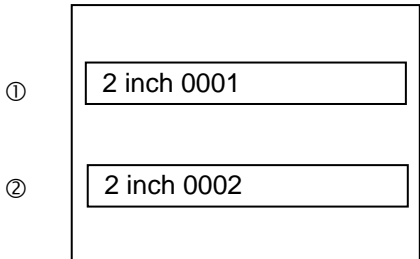
If communication is interrupted while the Bit Map Font Format Command is running and no subsequent data is transmitted in the next transmission, a command error occurs. If communication is interrupted by the command separator, printing is available when the print data is retransmitted from the beginning in the next transmission.

[Command transmission and print results (Examples)]

(1) When transmitting print data for two labels as usual,



Print result: ① and ② as shown below are printed in a row.



(2) When interrupting communication while the 2nd label command is running, and then transmitting subsequent data,

1st transmission:

```
{AY;+00,1,3}
{D0130,0480,0100}
{C}
{LC;0010,0010,0470,0060,1,2}
{PC00;0030,0050,2,1,a,00,B,+0000000000}
{RC00;2inch 0001}
{XS;l,0001,0000C2011}
```

1st label data

```
{AY;+00,1,3}
{D0130,0480,0100}
{C}
{LC;0010,0010,0470,0060,1,2}
{PC00;0030,0050,
```

2nd label data

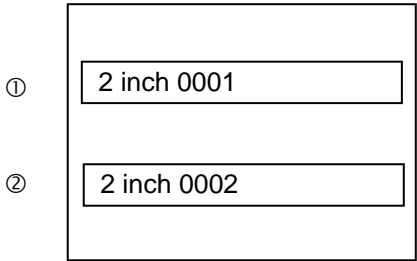
Interrupts communication while the command is running.

2nd transmission:

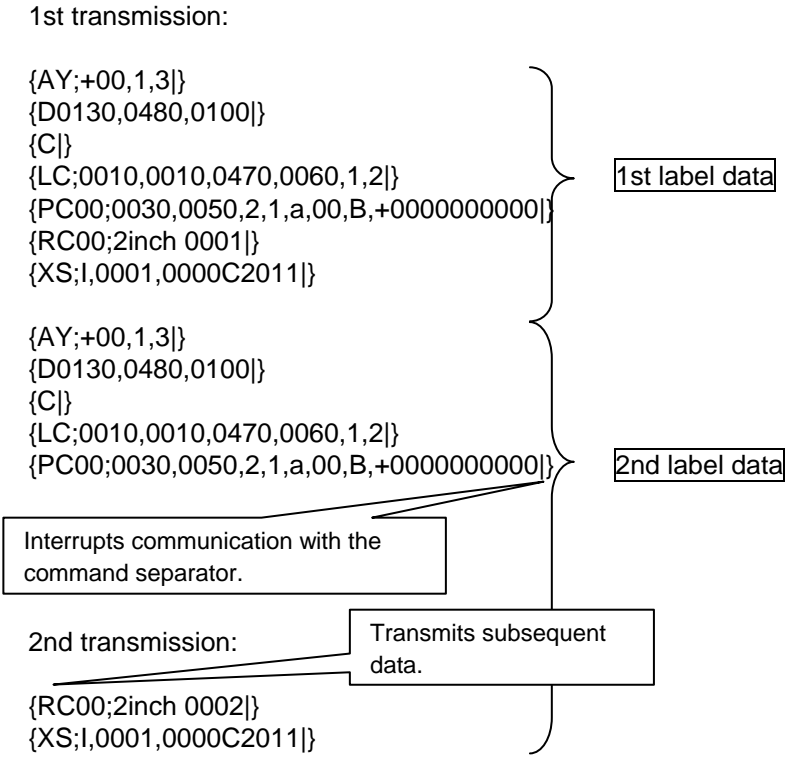
Transmits subsequent data.

```
2,1,a,00,B,+0000000000}
{RC00;2inch 0002}
{XS;l,0001,0000C2011}
```

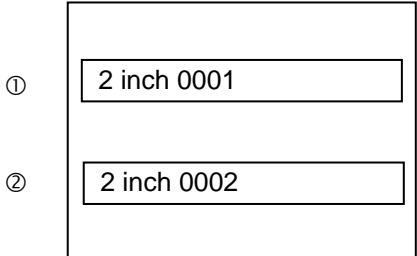
Print result: ① as shown below is printed after the 1st transmission, and ② as shown below is printed after the 2nd transmission.



(3) When interrupting communication with the 2nd label command separator, and then transmitting subsequent data,

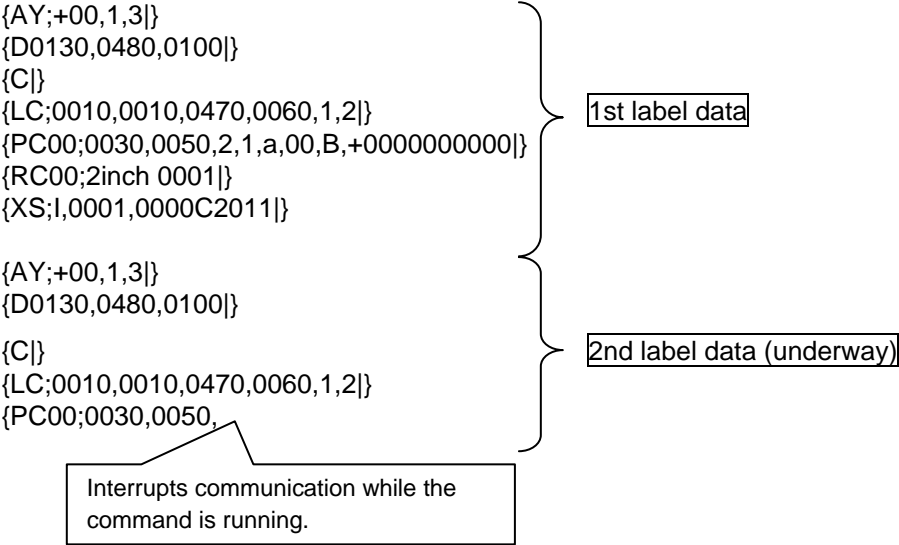


Print result: ① as shown below is printed after the 1st transmission, and ② as shown below is printed after the 2nd transmission.

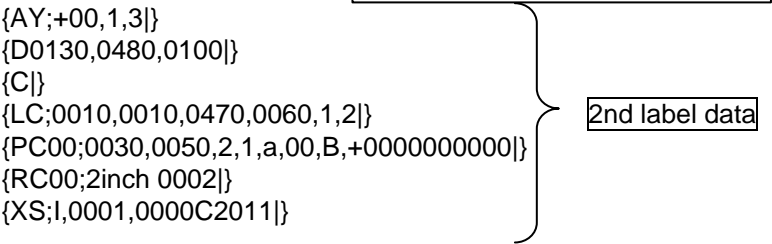


(4) When interrupting communication while the 2nd label command is running, and then retransmitting the 2nd label data from the beginning,

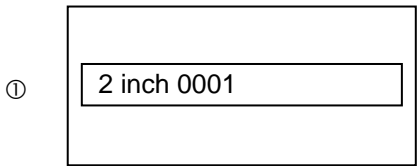
1st transmission:



2nd transmission:

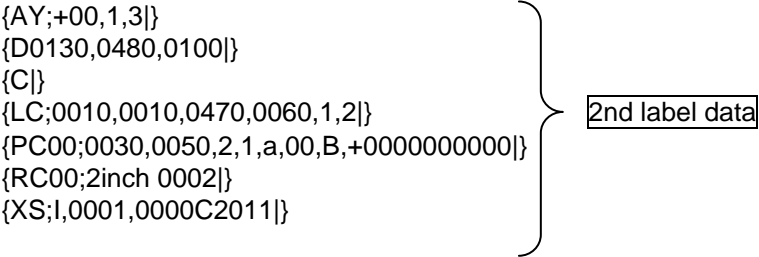
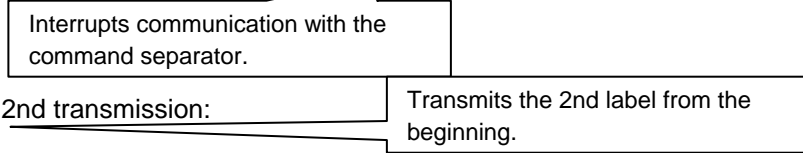
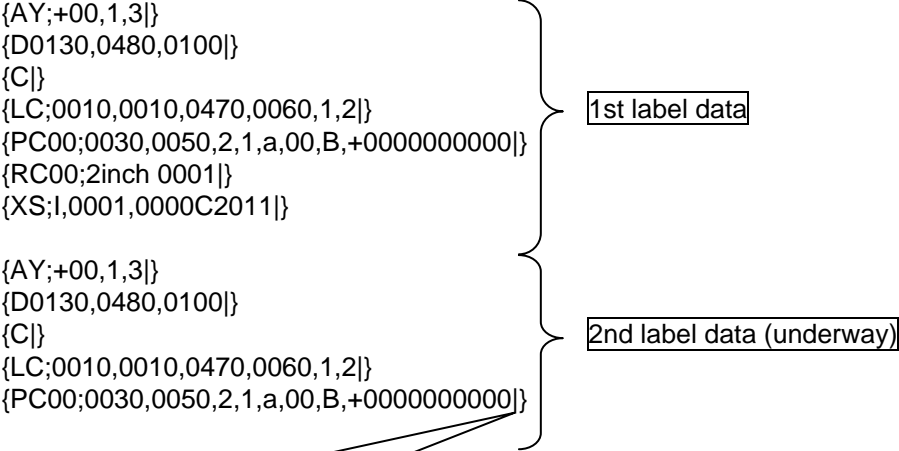


Print result: ① as shown below is printed after the 1st transmission, and a command error occurs after the 2nd transmission.

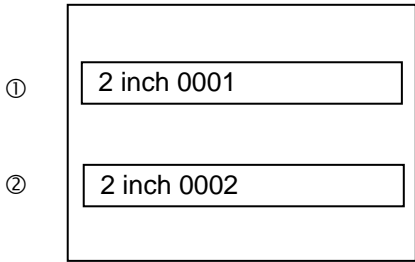


(5) When interrupting communication with the 2nd label command separator, and then retransmitting the 2nd label data from the beginning,

1st transmission:



Print result: ① as shown below is printed after the 1st transmission, and ② as shown below is printed after the 2nd transmission.



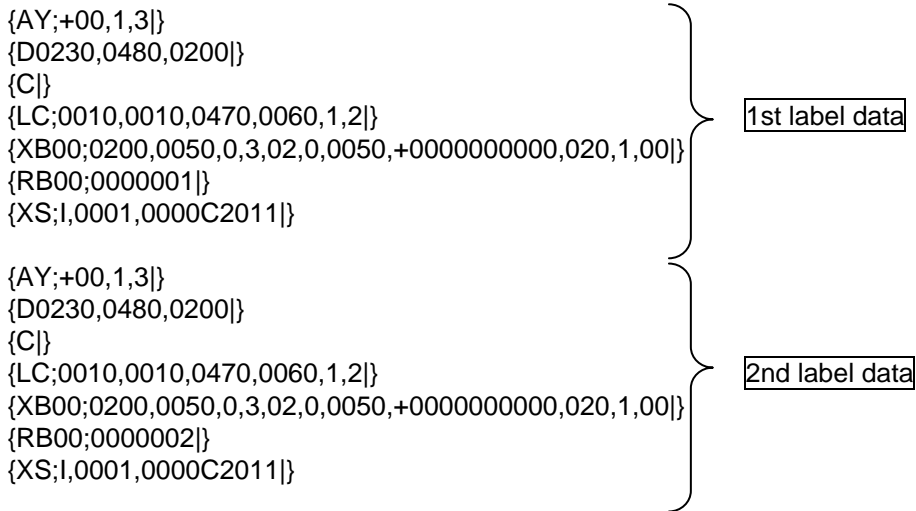
4.2.3.2 BARCODE/2-D CODE FORMAT COMMAND

As in the case of the Bit Map Font Format Command, if communication is interrupted while the Barcode/2-D Code Format Command is running and no subsequent data is transmitted in the next transmission, a command error occurs.

If communication is interrupted by the command separator, printing is available when the print data is retransmitted from the beginning in the next transmission.

[Command transmission and print results (Examples)]

(1) When transmitting print data for two labels as usual,



Print result: The 1st label data and 2nd label data are printed in a row.

(2) When interrupting communication while the 2nd label command is running, and then transmitting subsequent data,

1st transmission:

```
{AY;+00,1,3}  
{D0230,0480,0200}  
{C}  
{LC;0010,0010,0470,0060,1,2}  
{XB00;0200,0050,0,3,02,0,0050,+0000000000,020,1,00}  
{RB00;0000001}  
{XS;l,0001,0000C2011}
```

1st label data

```
{AY;+00,1,3}  
{D0230,0480,0200}  
{C}  
{LC;0010,0010,0470,0060,1,2}  
{XB00;0200,0050,0,3,02,0,0050,+0
```

2nd label data

Interrupts communication while the command is running.

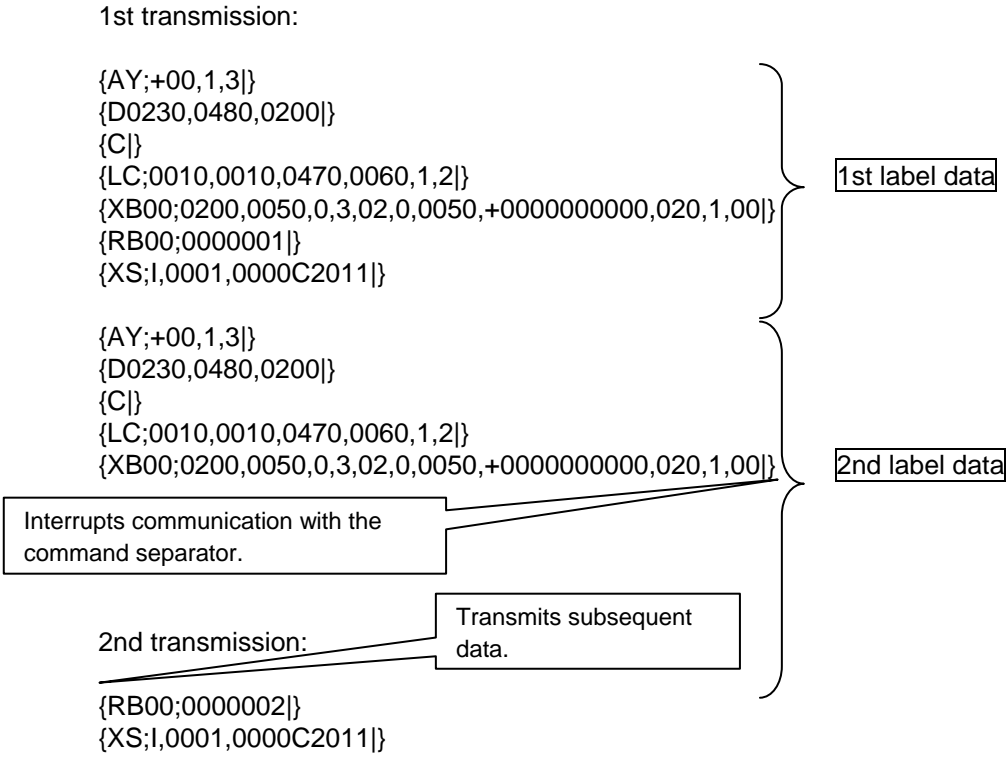
2nd transmission:

Transmits subsequent data.

```
000000000,020,1,00}  
{RB00;0000002}  
{XS;l,0001,0000C2011}
```

Print result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

(3) When interrupting communication with the 2nd label command separator, and then transmitting subsequent data,



Print result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

(4) When interrupting communication while the 2nd label command is running, and then retransmitting the 2nd label data from the beginning,

1st transmission:

```
{AY;+00,1,3}
{D0130,0480,0100}
{C}
{LC;0010,0010,0470,0060,1,2}
{PC00;0030,0050,2,1,a,00,B,+0000000000}
{RC00;2inch 0001}
{XS;l,0001,0000C2011}
```

1st label data

```
{AY;+00,1,3}
{D0130,0480,0100}
{C}
{LC;0010,0010,0470,0060,1,2}
{XB00;0200,0050,0,3,02,0,0050,+0
```

2nd label data (underway)

Interrupts communication while the command is running.

2nd transmission:

Transmits the 2nd label from the beginning.

```
{AY;+00,1,3}
{D0230,0480,0200}
{C}
{LC;0010,0010,0470,0060,1,2}
{XB00;0200,0050,0,3,02,0,0050,+0000000000,020,1,00}
{RB00;0000002}
{XS;l,0001,0000C2011}
```

2nd label data

Print result: The 1st label data is printed after the 1st transmission, and a command error occurs after the 2nd transmission.

(5) When interrupting communication with the 2nd label command separator, and then retransmitting the 2nd label data from the beginning,

1st transmission:

```
{AY;+00,1,3}  
{D0130,0480,0100}  
{C}  
{LC;0010,0010,0470,0060,1,2}  
{PC00;0030,0050,2,1,a,00,B,+0000000000}  
{RC00;2inch 0001}  
{XS;l,0001,0000C2011}
```

1st label data

```
{AY;+00,1,3}  
{D0130,0480,0100}  
{C}  
{LC;0010,0010,0470,0060,1,2}  
{PC00;0030,0050,2,1,a,00,B,+0000000000}
```

2nd label data (underway)

Interrupts communication with the command separator.

2nd transmission:

Transmits the 2nd label from the beginning.

```
{AY;+00,1,3}  
{D0230,0480,0200}  
{C}  
{LC;0010,0010,0470,0060,1,2}  
{XB00;0200,0050,0,3,02,0,0050,+0000000000,020,1,00}  
{RB00;0000002}  
{XS;l,0001,0000C2011}
```

2nd label data

Print result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

4.2.3.3 GRAPHIC COMMAND

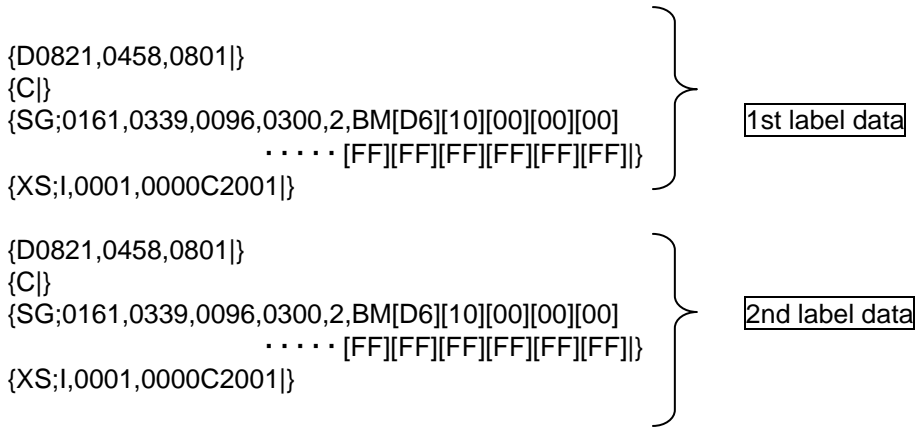
When transmission is cancelled while graphic data is transmitted from the application, the data cannot be properly printed because data subsequently transmitted is recognized as a graphic command unless the graphic data has been transmitted before the transmission is cancelled.

If communication is interrupted while graphic data is transmitted, it is necessary to transmit graphic data for the number of bytes that was not transmitted as dummy data, turn off and on the power of the printer, or reset the printer.

[Command transmission and print results (Examples)]

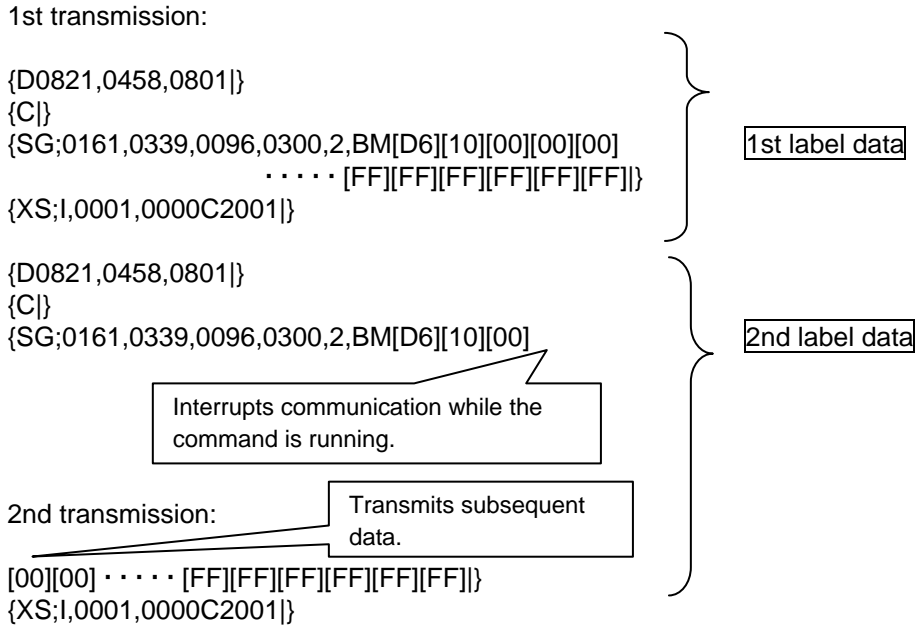
* Descriptions are provided without graphic data omitted.

(1) When transmitting print data for two labels as usual,



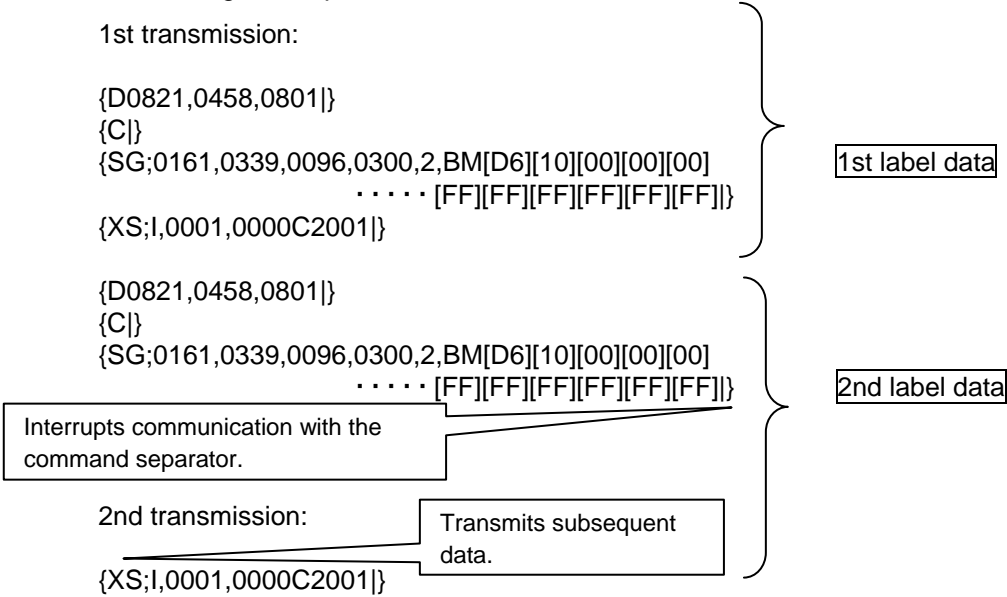
Print result: The 1st label data and 2nd label data are printed in a row.

(2) When interrupting communication while the 2nd label command is running, and then transmitting subsequent data,



Print result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

(3) When interrupting communication with the 2nd label command separator, and then transmitting subsequent data,

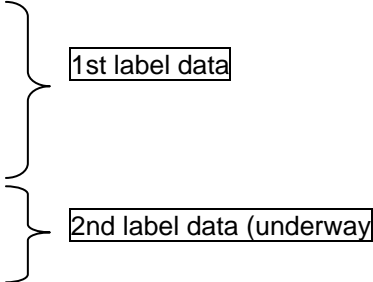


Print result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

(4) When interrupting communication while the 2nd label command is running, and then retransmitting the 2nd label data from the beginning,

1st transmission:

```
{D0821,0458,0801}  
{C}  
{SG;0161,0339,0096,0300,2,BM[D6][10][00][00]  
..... [FF][FF][FF][FF][FF][FF]}  
{XS;l,0001,0000C2001}
```

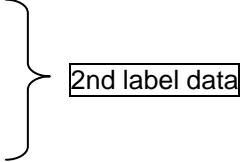


Interrupts communication while the command is running.

2nd transmission:

```
{D0821,0458,0801}  
{C}  
{SG;0161,0339,0096,0300,2,BM[D6][10][00][00]  
..... [FF][FF][FF][FF][FF][FF]}  
{XS;l,0001,0000C2001}
```

Transmits the 2nd label from the beginning.



Print result: The 1st label data is printed after the 1st transmission, and a command error occurs after the 2nd transmission. (data reception continues until the number of bytes specified by the graphic data in the initial transmission is obtained. Then, a command error occurs when the end code of the command is checked.)

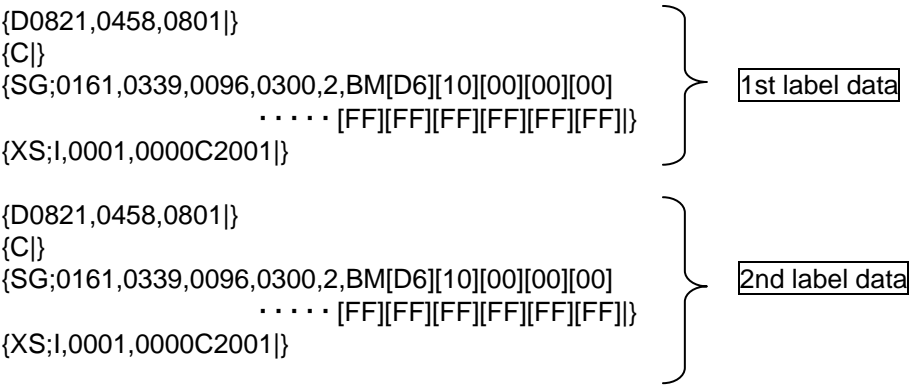
(5) When interrupting communication with the 2nd label command separator, and then retransmitting the 2nd label data from the beginning,

1st transmission:



Interrupts communication with the command separator.

2nd transmission: Transmits the 1st label from the beginning.



Print result: The 1st label data is printed after the 1st transmission, and the 1st label data and 2nd label data are printed after the 2nd transmission (3 labels in total).

4.2.3.4 PC SAVE COMMAND


When transmission is cancelled while PC saved data is transmitted from the application, the data may not be properly stored because data subsequently transmitted is saved on the PC unless the PC saved data has been transmitted before the transmission is cancelled.

If communication is interrupted while PC saved data is stored, it is necessary to issue the PC Save Terminate Command, turn off and on the power of the printer, or reset the printer.

[Command transmission and storage results (Examples)]

(1) When transmitting PC saved data as usual,

```
{XO;25,S0,1}  
{D1430,0480,1400}  
{C}  
{LC;0000,0000,0050,0000,0,1}  
{LC;0000,0001,0050,0001,0,1}  
{LC;0000,0002,0050,0002,0,1}  
{LC;0000,0003,0050,0003,0,1}  
{LC;0000,0004,0050,0004,0,1}  
{LC;0000,0005,0050,0005,0,1}  
{XS;1,0001,0000C1001}  
{XP}  
{XQ;25,S0,1,L}
```



1st label data

Storage result: Data is properly stored.

(2) When interrupting communication while the PC Save Command is running, and then transmitting subsequent data,

1st transmission:

```
{XO;25,S0,1|}  
{D1430,0480,1400}  
{C|}  
{LC;0000,0000,0050,0000,0,1|}  
{LC;0000,0001,0050,0001,0,1|}  
{LC;0000,0002,0050,0002,0,1|}  
{LC;0000,0003,0050,0003,0,1|}  
{LC;0000,000
```

Interrupts communication while the command is running.

1st label data

2nd transmission:

```
4,0050,0004,0,1|}  
{LC;0000,0005,0050,0005,0,1|}  
{XS;l,0001,0000C1001|}  
{XP|}  
{XQ;25,S0,1,L|}
```

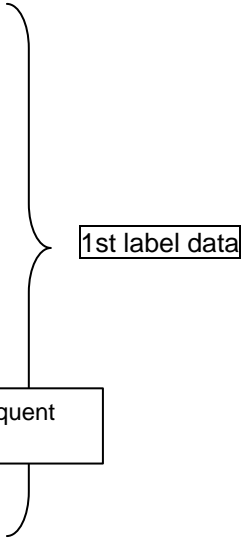
Transmits subsequent data.

Storage result: Data is properly stored.

(3) When interrupting communication with the PC Save Command separator, and then transmitting subsequent data,

1st transmission:

```
{XO;25,S0,1|}  
{D1430,0480,1400}  
{C|}  
{LC;0000,0000,0050,0000,0,1}  
{LC;0000,0001,0050,0001,0,1}  
{LC;0000,0002,0050,0002,0,1}  
{LC;0000,0003,0050,0003,0,1}  
{LC;0000,0004,0050,0004,0,1}
```



Interrupts communication with the command separator.

2nd transmission:

```
{LC;0000,0005,0050,0005,0,1}  
{XS;l,0001,0000C1001|}  
{XP|}  
{XQ;25,S0,1,L|}
```

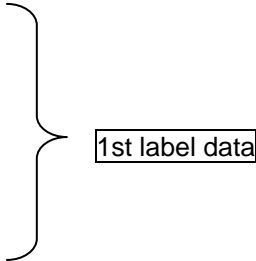
Transmits subsequent data.

Storage result: Data is properly stored.

(4) When interrupting communication while the PC Save Command is running, and then retransmitting data from the beginning,

1st transmission:

```
{XO;25,S0,1}  
{D1430,0480,1400}  
{C}  
{LC;0000,0000,0050,0000,0,1}  
{LC;0000,0001,0050,0001,0,1}  
{LC;0000,0002,0050,0002,0,1}  
{LC;0000,0003,0050,0003,0,1}  
{LC;0000,000
```

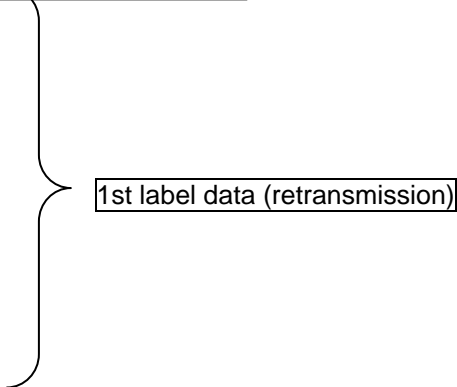


Interrupts communication while the command is running.

2nd transmission:

```
{XO;25,S0,1}  
{D1430,0480,1400}  
{C}  
{LC;0000,0000,0050,0000,0,1}  
{LC;0000,0001,0050,0001,0,1}  
{LC;0000,0002,0050,0002,0,1}  
{LC;0000,0003,0050,0003,0,1}  
{LC;0000,0004,0050,0004,0,1}  
{LC;0000,0005,0050,0005,0,1}  
{XS;l,0001,0000C1001}  
{XP}  
{XQ;25,S0,1,L}
```

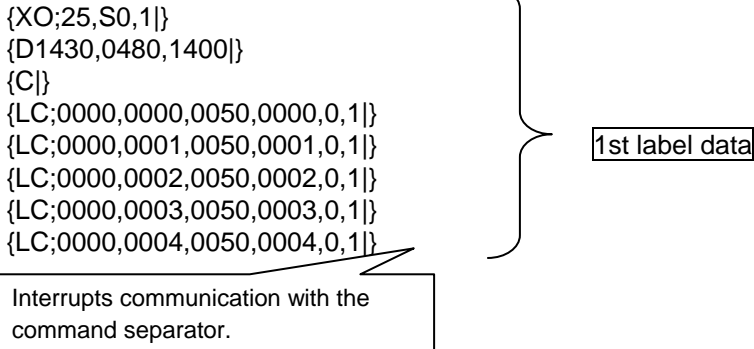
Transmits data from the beginning.



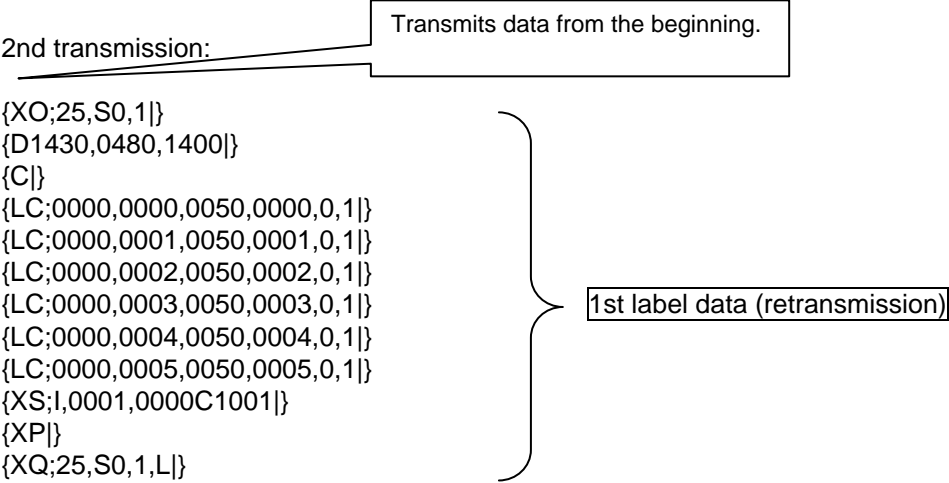
Storage result: Data is properly stored, however, when it is read, a command error occurs.

(5) When interrupting communication with the PC Save Command separator, and then retransmitting data from the beginning,

1st transmission:



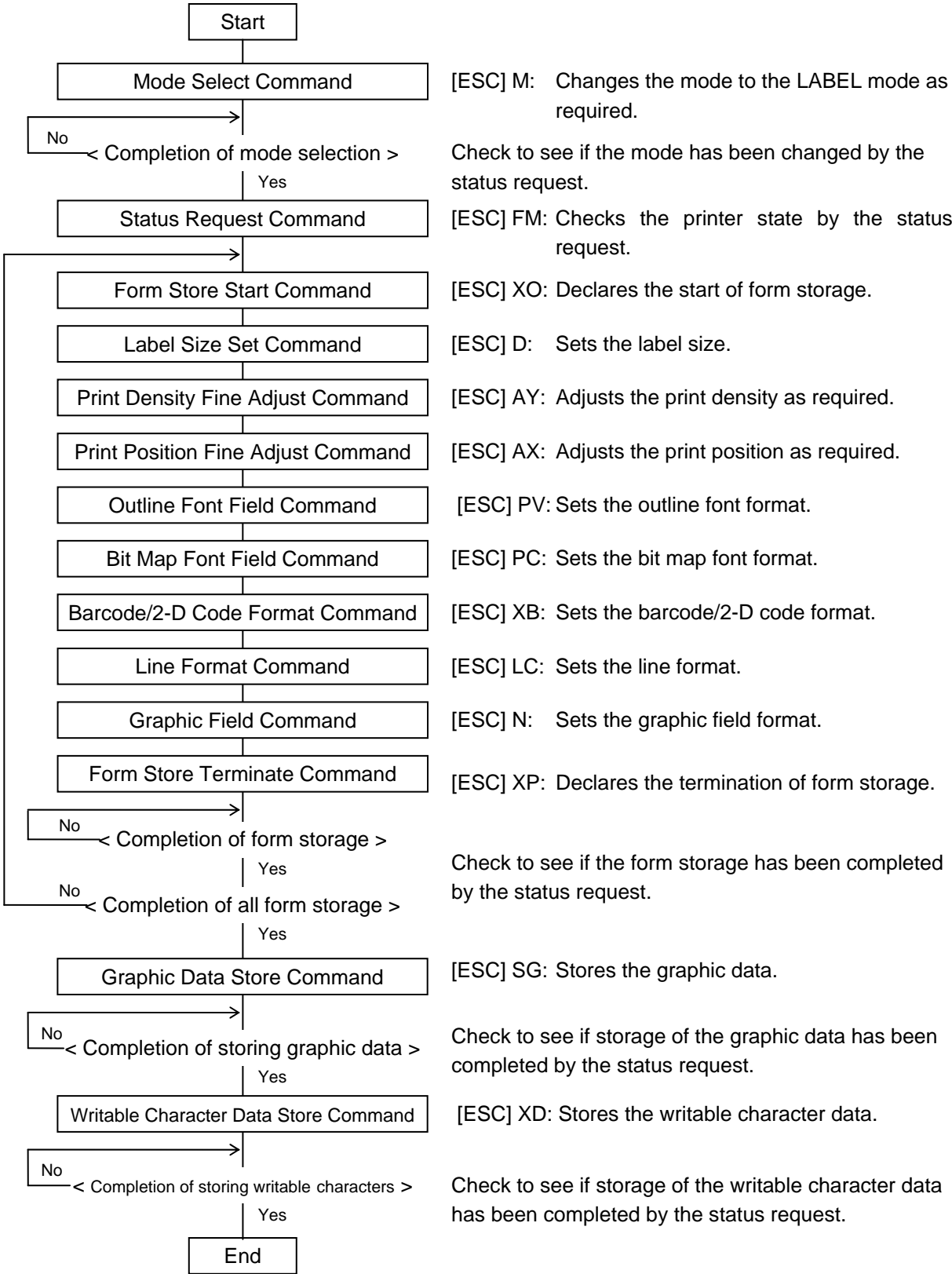
2nd transmission:



Storage result: Data is properly stored.

4.3 LABEL MODE

4.3.1 INITIAL SETTING



- NOTES:** (1) *Previously assign the form to be stored to each form No., and store it. Store writable character data and graphic data as required.*
- (2) *When a command such as the above is sent, be sure to confirm that the process is completed, before the next command is sent.*

4.3.3 HANDLING OF RECEIVED DATA BY COMMAND

4.3.3.1 COMMAND PROCESSING

If communication is interrupted while a command is running and no subsequent data is transmitted in the next transmission, a command error occurs.

[Command transmission and storage results (Examples)]

(1) When interrupting communication while the 2nd label command is running, and then transmitting subsequent data,

1st transmission:

```
[1B]XO;01,1[0A][00]
[1B]AY;+00,1[0A][00]
[1B]AX;+000[0A][00]
[1B]D0450,0480,0420[0A][00]
[1B]LC;0050,0030,0250,0030,1,1[0A][00]
[1B]LC;0050,0060,0250,0060,1,2[0A][00]
[1B]LC;0050,0090,0250,0090,1,3[0A][00]
[1B]LC;0050,0120,0250,0120,1,4[0A][00]
[1B]LC;0050,0150,0250,0150,1,5[0A][00]
[1B]XP[0A][00]
[1B]X[01][21][01][00]
```

1st label data

Interrupts communication while the command is running.

2nd transmission:

Transmits subsequent data.

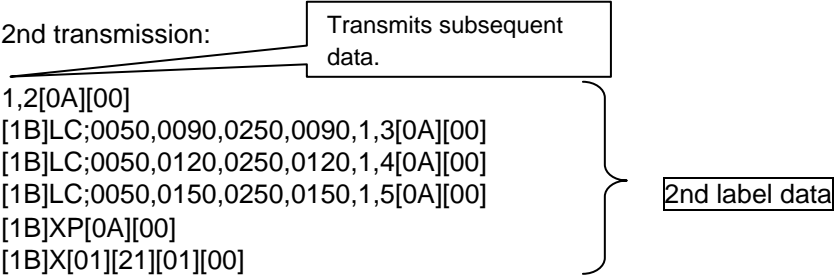
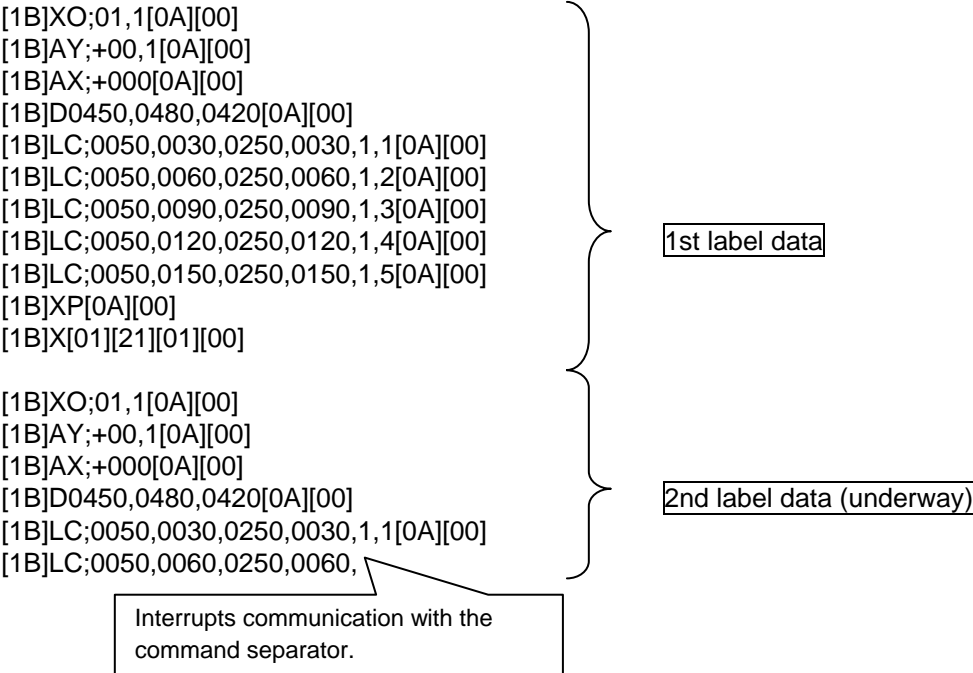
```
[1B]XO;01,1[0A][00]
[1B]AY;+00,1[0A][00]
[1B]AX;+000[0A][00]
[1B]D0450,0480,0420[0A][00]
[1B]LC;0050,0030,0250,0030,1,1[0A][00]
[1B]LC;0050,0060,0250,0060,1,2[0A][00]
[1B]LC;0050,0090,0250,0090,1,3[0A][00]
[1B]LC;0050,0120,0250,0120,1,4[0A][00]
[1B]LC;0050,0150,0250,0150,1,5[0A][00]
[1B]XP[0A][00]
[1B]X[01][21][01][00]
```

2nd label data

Storage result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

(2) When interrupting communication with the 2nd label command separator, and then transmitting subsequent data,

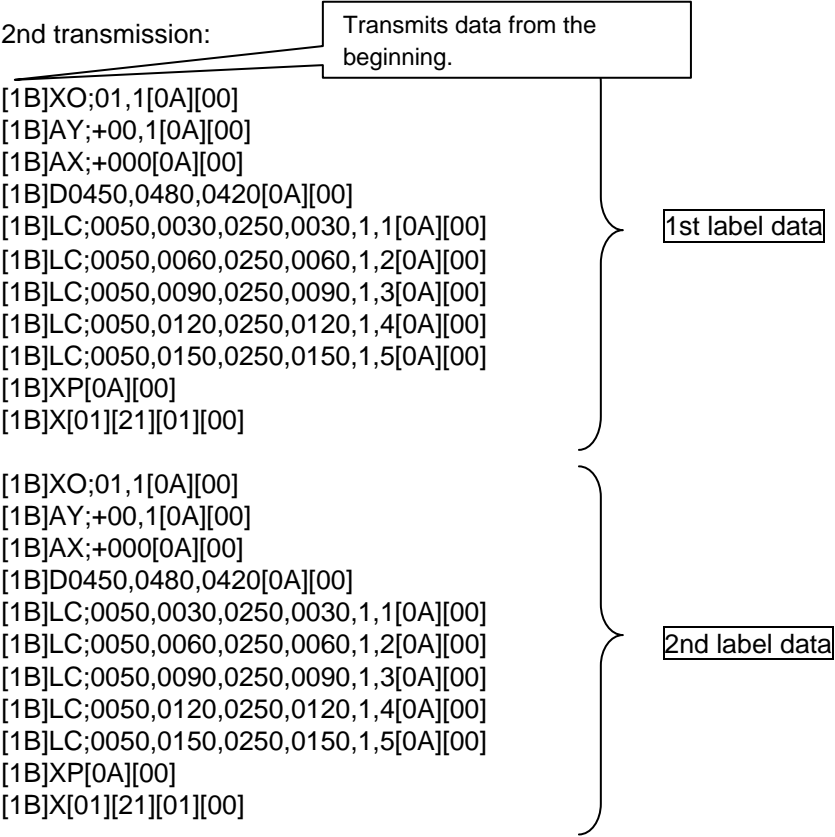
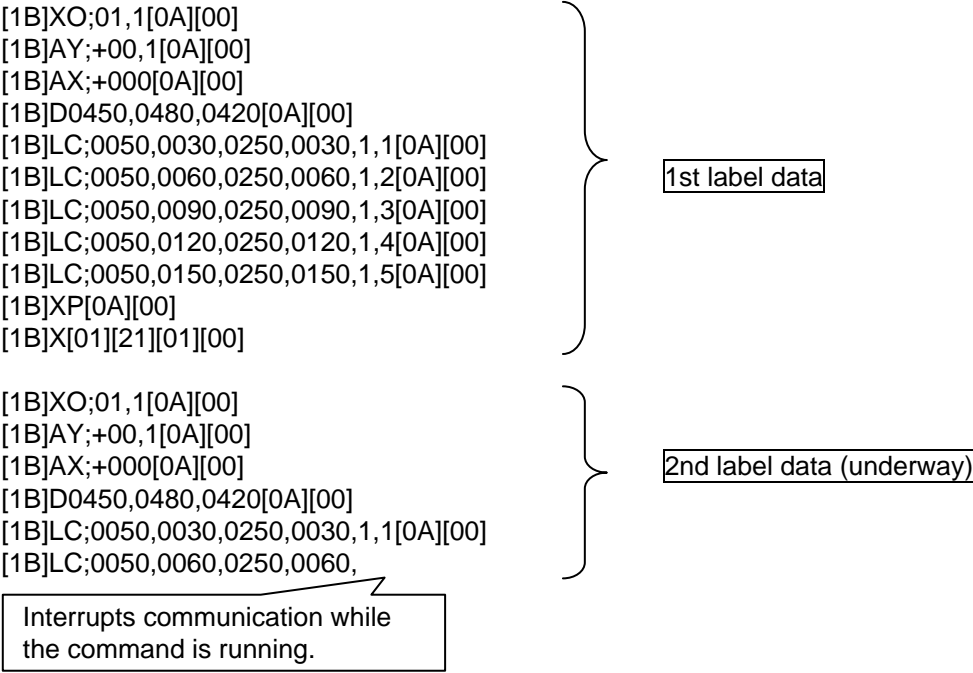
1st transmission:



Storage result: The 1st label data is printed after the 1st transmission, and the 2nd label data is printed after the 2nd transmission.

(3) When interrupting communication while the 3rd label command is running, and then retransmitting data from the beginning,

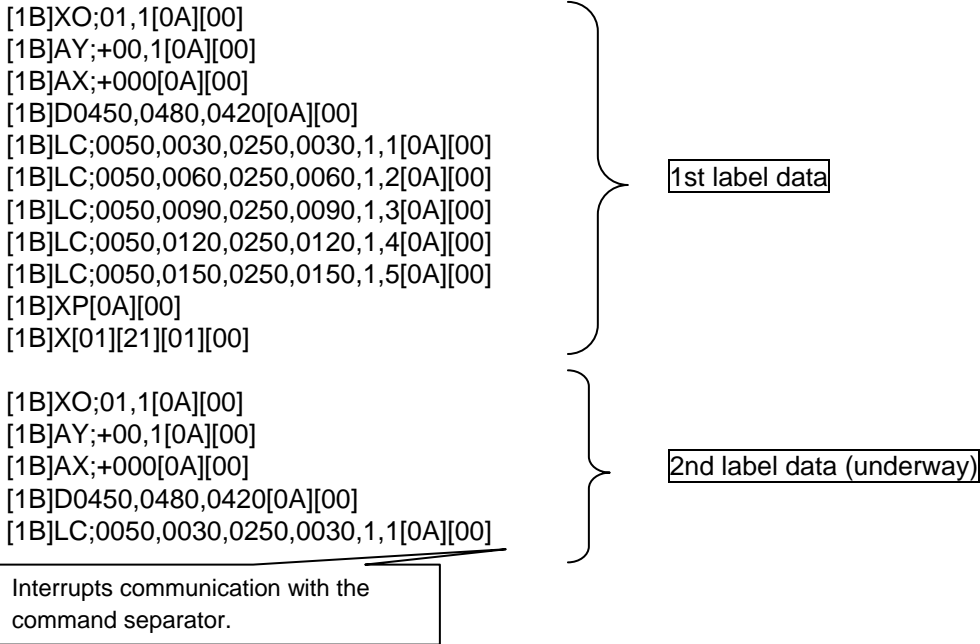
1st transmission:



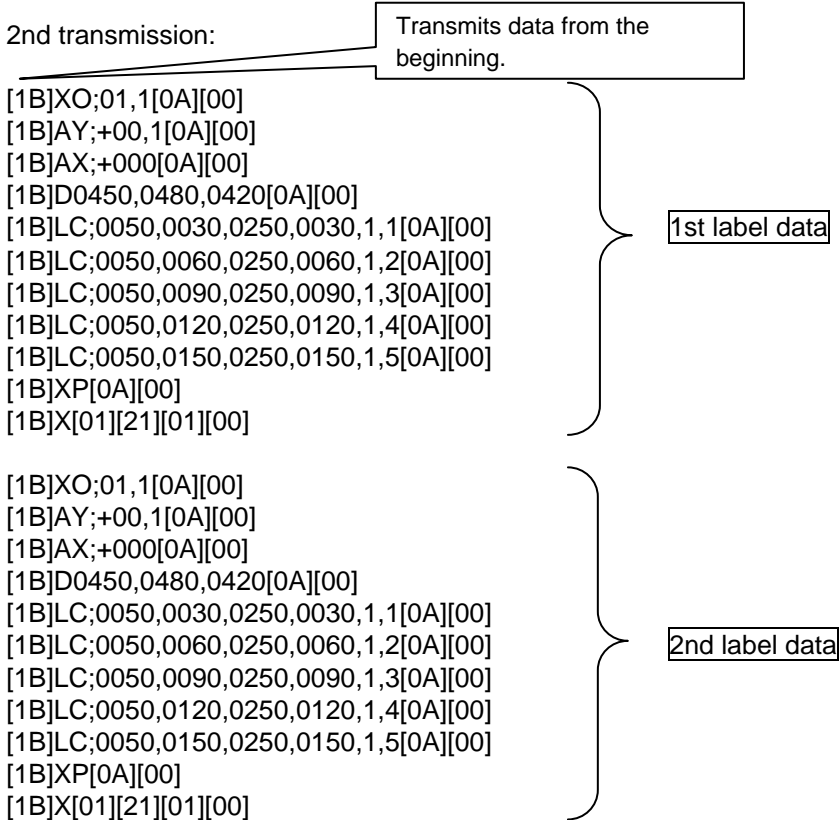
Storage result: The 1st label data is printed after the 1st transmission, and a command error occurs after the 2nd transmission.

(4) When interrupting communication with the 2nd label command separator, and then retransmitting data from the beginning,

1st transmission:



2nd transmission:



Storage result: The 1st label data is printed after the 1st transmission, and the 1st label data and 2nd label data are printed after the 2nd transmission (3 labels in total).

4.3.3.2 FORM STORE COMMAND

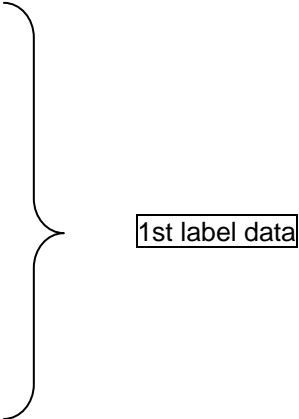
When transmission is cancelled while form storage data is transmitted from the application, the data may not be properly stored because data subsequently transmitted is stored in the form unless the Form Store Terminate Command is issued before the transmission is cancelled.

If communication is interrupted while form storage data is transmitted, it is necessary to issue the Form Store Terminate Command, turn off and on the power of the printer, or reset the printer.

[Command transmission and storage results (Examples)]

(1) When transmitting form storage data as usual,

```
[1B]XO;01,1[0A][00]
[1B]AY;+00,1[0A][00]
[1B]AX;+000[0A][00]
[1B]D0450,0480,0420[0A][00]
[1B]LC;0050,0030,0250,0030,1,1[0A][00]
[1B]LC;0050,0060,0250,0060,1,2[0A][00]
[1B]LC;0050,0090,0250,0090,1,3[0A][00]
[1B]LC;0050,0120,0250,0120,1,4[0A][00]
[1B]LC;0050,0150,0250,0150,1,5[0A][00]
[1B]LC;0050,0180,0250,0180,1,6[0A][00]
[1B]XP[0A][00]
[1B]X[01][21][01][00]
```



Storage result: Data is properly stored.

(2) When interrupting communication while the Form Store Command is running, and then transmitting subsequent data,

1st transmission:

```
[1B]XO;01,1[0A][00]  
[1B]AY;+00,1[0A][00]  
[1B]AX;+000[0A][00]  
[1B]D0450,0480,0420[0A][00]  
[1B]LC;0050,0030,0250,0030,1,1[0A][00]  
[1B]LC;0050,0060,0250,0060,1,2[0A][00]  
[1B]LC;0050,0090,0250,0090,1,3[0A][00]  
[1B]LC;0050,
```

Interrupts communication while the command is running.

1st label data

2nd transmission:

Transmits subsequent data.

```
,0120,1,4[0A][00]  
[1B]LC;0050,0150,0250,0150,1,5[0A][00]  
[1B]LC;0050,0180,0250,0180,1,6[0A][00]  
[1B]XP[0A][00]  
[1B]X[01][21][01][00]
```

Storage result: Data is properly stored.

(3) When interrupting communication with the Form Store Command separator, and then transmitting subsequent data,

1st transmission:

```
[1B]XO;01,1[0A][00]  
[1B]AY;+00,1[0A][00]  
[1B]AX;+000[0A][00]  
[1B]D0450,0480,0420[0A][00]  
[1B]LC;0050,0030,0250,0030,1,1[0A][00]  
[1B]LC;0050,0060,0250,0060,1,2[0A][00]  
[1B]LC;0050,0090,0250,0090,1,3[0A][00]  
[1B]LC;0050,,0120,1,4[0A][00]
```

Interrupts communication with the command separator.

1st label data

2nd transmission:

Transmits subsequent data.

```
[1B]LC;0050,0150,0250,0150,1,5[0A][00]  
[1B]LC;0050,0180,0250,0180,1,6[0A][00]  
[1B]XP[0A][00]  
[1B]X[01][21][01][00]
```

Storage result: Data is properly stored.

(4) When interrupting communication while the Form Store Command is running, and then retransmitting data from the beginning,

1st transmission:

```
[1B]XO;01,1[0A][00]  
[1B]AY;+00,1[0A][00]  
[1B]AX;+000[0A][00]  
[1B]D0450,0480,0420[0A][00]  
[1B]LC;0050,0030,0250,0030,1,1[0A][00]  
[1B]LC;0050,0060,0250,0060,1,2[0A][00]  
[1B]LC;0050,0090,0250,0090,1,3[0A][00]  
[1B]LC;0050,
```



1st label data (underway)

Interrupts communication while the command is running.

2nd transmission:

Transmits data from the beginning.

```
[1B]XO;01,1[0A][00]  
[1B]AY;+00,1[0A][00]  
[1B]AX;+000[0A][00]  
[1B]D0450,0480,0420[0A][00]  
[1B]LC;0050,0030,0250,0030,1,1[0A][00]  
[1B]LC;0050,0060,0250,0060,1,2[0A][00]  
[1B]LC;0050,0090,0250,0090,1,3[0A][00]  
[1B]LC;0050,0120,0250,0120,1,4[0A][00]  
[1B]LC;0050,0150,0250,0150,1,5[0A][00]  
[1B]LC;0050,0180,0250,0180,1,6[0A][00]  
[1B]XP[0A][00]  
[1B]X[01][21][01][00]
```



1st label data (retransmission)

Storage result: Data is properly stored, however, when it is read, a command error occurs.

(5) When interrupting communication with the Form Store Command separator, and retransmitting data from the beginning,

1st transmission:

```
[1B]XO;01,1[0A][00]  
[1B]AY;+00,1[0A][00]  
[1B]AX;+000[0A][00]  
[1B]D0450,0480,0420[0A][00]  
[1B]LC;0050,0030,0250,0030,1,1[0A][00]  
[1B]LC;0050,0060,0250,0060,1,2[0A][00]  
[1B]LC;0050,0090,0250,0090,1,3[0A][00]  
[1B]LC;0050,0120,0250,0120,1,4[0A][00]
```

1st label data (underway)

Interrupts communication with the command separator.

2nd transmission:

Transmits data from the beginning.

```
[1B]XO;01,1[0A][00]  
[1B]AY;+00,1[0A][00]  
[1B]AX;+000[0A][00]  
[1B]D0450,0480,0420[0A][00]  
[1B]LC;0050,0030,0250,0030,1,1[0A][00]  
[1B]LC;0050,0060,0250,0060,1,2[0A][00]  
[1B]LC;0050,0090,0250,0090,1,3[0A][00]  
[1B]LC;0050,0120,0250,0120,1,4[0A][00]  
[1B]LC;0050,0150,0250,0150,1,5[0A][00]  
[1B]LC;0050,0180,0250,0180,1,6[0A][00]  
[1B]XP[0A][00]  
[1B]X[01][21][01][00]
```

1st label data (retransmission)

Storage result: Data is properly stored.
However, if the data retransmitted is different from the one first transmitted, the printed output may be incomplete.

(2) When interrupting communication while the Graphic Data Store Command is running, and then transmitting subsequent data,

1st transmission:

```
[1B][53][47][3B][31][2C][30][30][34][30][2C][30][30][34][30]
[2C][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF],
```

Interrupts communication while the command is running.

2nd transmission:

Transmits subsequent data.

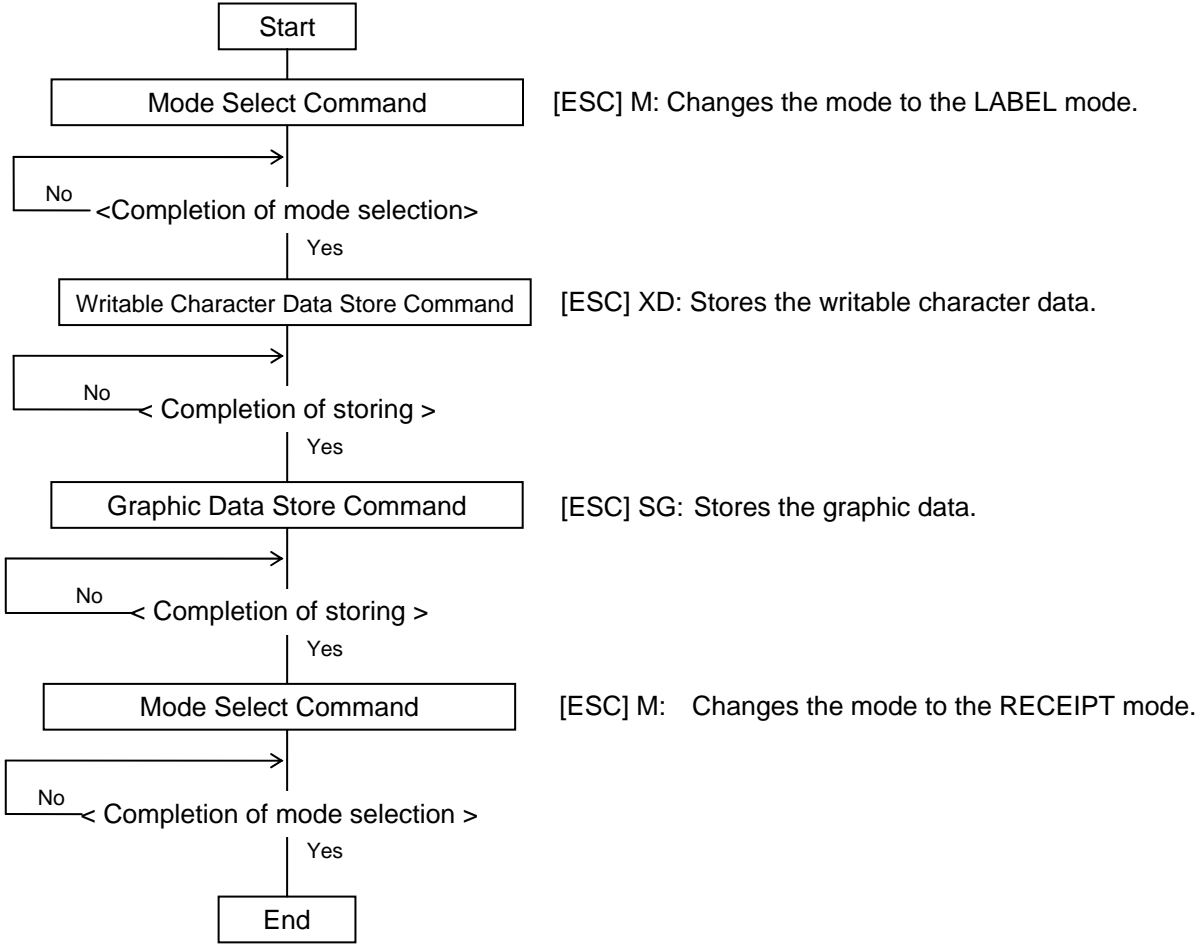
```
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF][FF]
[FF][FF][FF][FF][FF][FF][0A][00][0D][0A]
[1B]XO;01,1[0A][00]
[1B]D0630,0480,0600[0A][00]
[1B]PC00;0030,0050,2,2,A,00,B,00,1,0[0A][00]
[1B]PC00;0030,0350,2,2,A,00,B,00,1,0[0A][00]
[1B]N;1,0150,0100[0A][00]
[1B]N;2,0150,0400[0A][00]
[1B]XP[0A][00]
[1B]X[01][21][01]Graphic Data No. 1[0A]
Graphic Data No. 2[0A][00]
```

1st label data

Storage result: Data is properly stored.

4.4 RECEIPT MODE

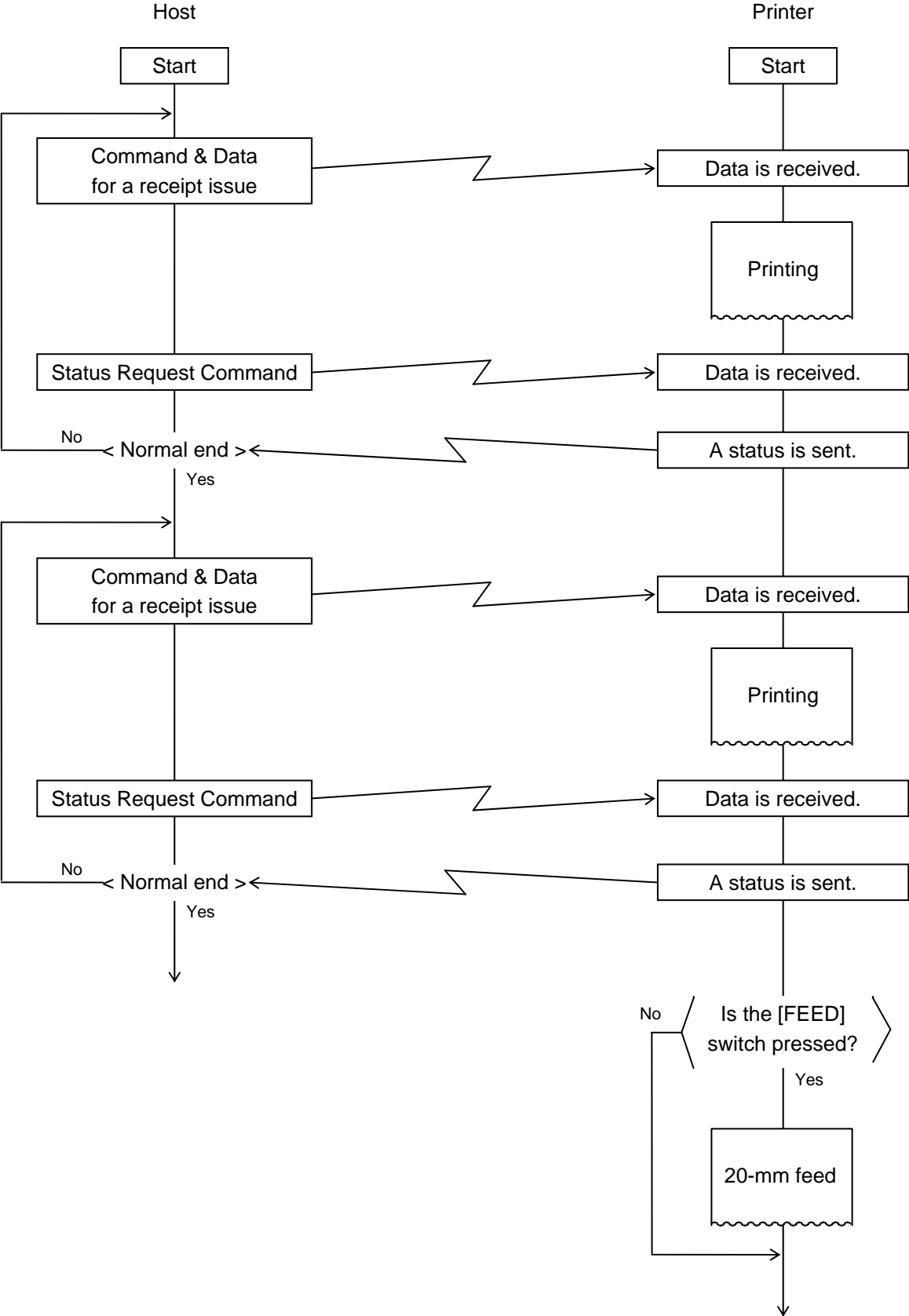
4.4.1 INITIAL SETTING



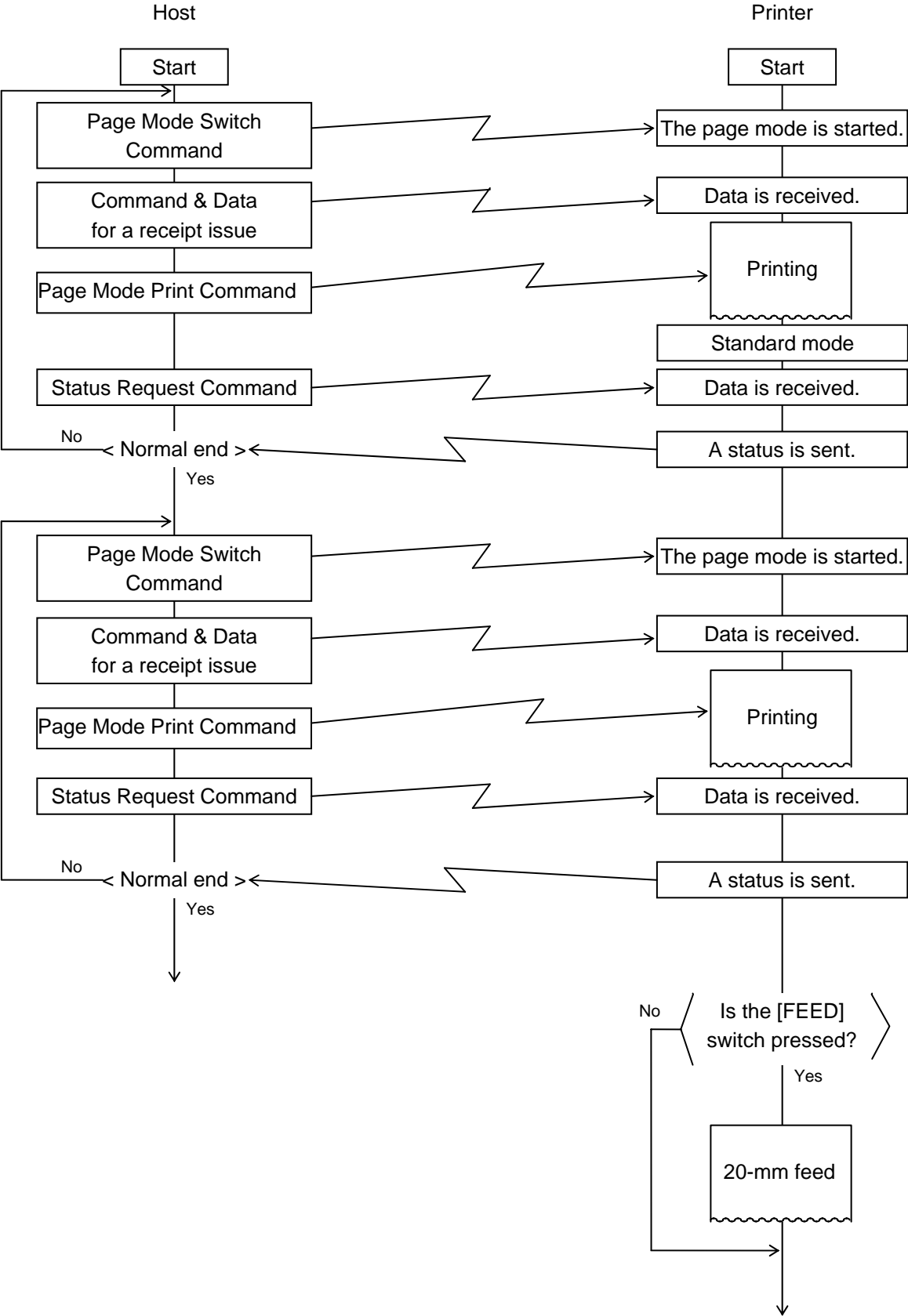
- NOTES:**
- (1) To store the writable character data, the mode should be changed to the LABEL mode. After storing is finished, the mode should be returned to the RECEIPT mode.
 - (2) When a command such as the above is sent, be sure to confirm that the process is completed, before the next command is sent.
 - (3) The graphic data store command is registerable even after changing the mode to the RECEIPT mode.

4.4.2 RECEIPT ISSUE OPERATION

4.4.2.1 STANDARD MODE



4.4.2.2 PAGE MODE



- NOTES:**
- (1) *In the RECEIPT mode, the status of issue end is not automatically sent. Before the next receipt is issued, whether or not the sent data is issued normally should be confirmed by sending the Status Request Command. When a receipt is not issued due to an error, the data should be sent again.*
 - (2) *In the RECEIPT mode, when the [FEED] switch is pressed, a 20-mm feed is performed.*
 - (3) *In the RECEIPT mode, the issue count cannot be set. If the batch/strip issue mode is set, it does not become effective.*

4.4.3 HANDLING OF RECEIVED DATA BY COMMAND

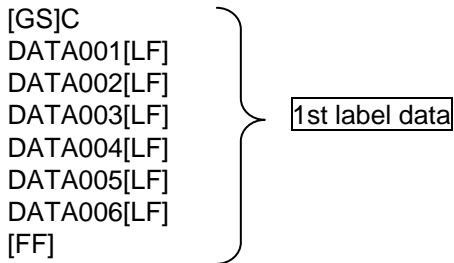
4.4.3.1 PAGE MODE PROCESSING

If communication is interrupted while data is transmitted from the application and no subsequent data is transmitted in the next transmission, a command error occurs. When transmission is cancelled while data is transmitted in page mode, the data may not be properly stored because data subsequently transmitted is processed in page mode unless the Page Mode Terminate Command [FF] or Page Mode Cancel Command [CAN] is issued before the transmission is cancelled. If communication is interrupted while data is transmitted in page mode, it is necessary to issue the Page Mode Terminate (Print) Command or Page Mode Cancel Command, turn off and on the power of the printer, or reset the printer.

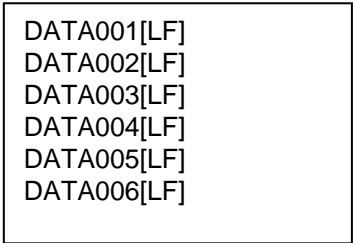
However, please note that when the Page Mode Terminate (Print) Command is issued, all previous data is erased.

[Command transmission and print results (Examples)]

(1) When transmitting data in page mode as usual,

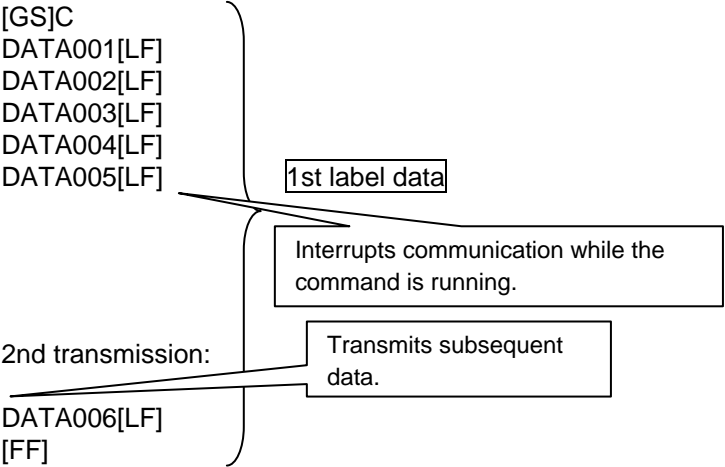


Print result: Data is properly printed (as shown below).



(2) When interrupting communication while the Page Mode Command is running, and then transmitting subsequent data,

1st transmission:

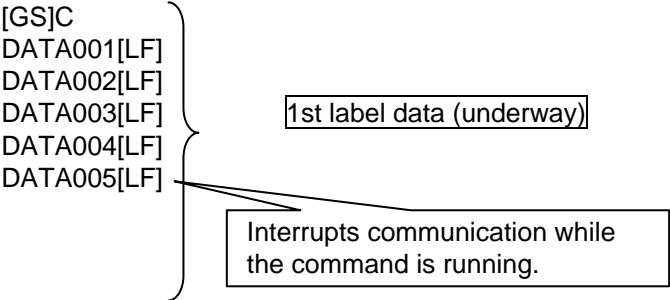


Print result: Data is properly printed (as shown below).

```
DATA001[LF]  
DATA002[LF]  
DATA003[LF]  
DATA004[LF]  
DATA005[LF]  
DATA006[LF]
```

(3) When interrupting communication while the Page Mode Command is running, and then retransmitting data from the beginning,

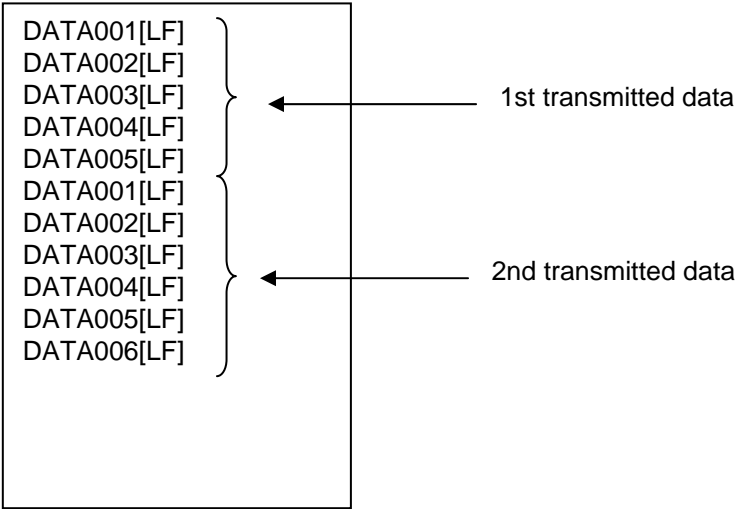
1st transmission:



2nd transmission: Transmits data from the beginning.

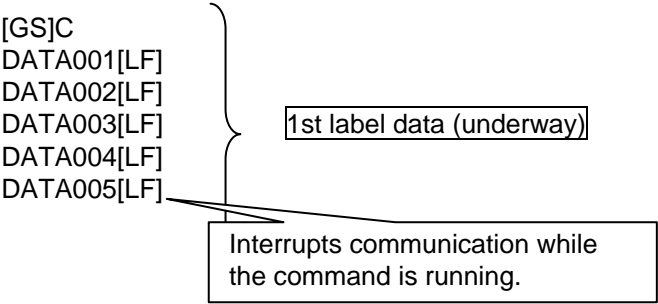


Print result: Data is printed but the printed output does not look correct (as shown below).

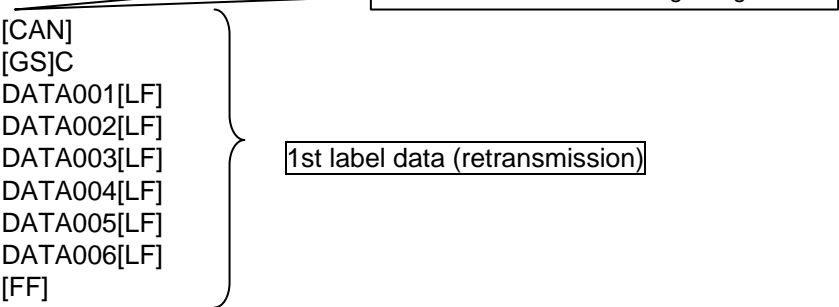


(4) When interrupting communication while the Page Mode Command is running, issuing the Cancel Command during retransmission and then retransmitting data from the beginning,

1st transmission:



2nd transmission:

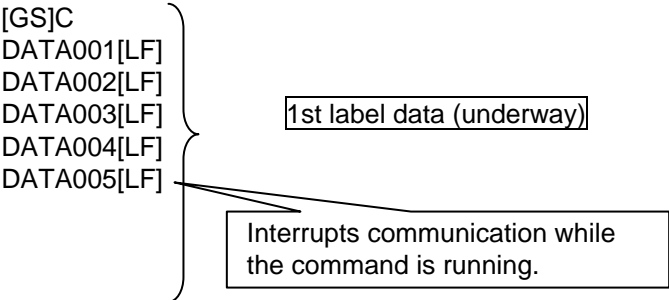


Print result: Data is properly printed (as shown below).

```
DATA001[LF]  
DATA002[LF]  
DATA003[LF]  
DATA004[LF]  
DATA005[LF]  
DATA006[LF]
```

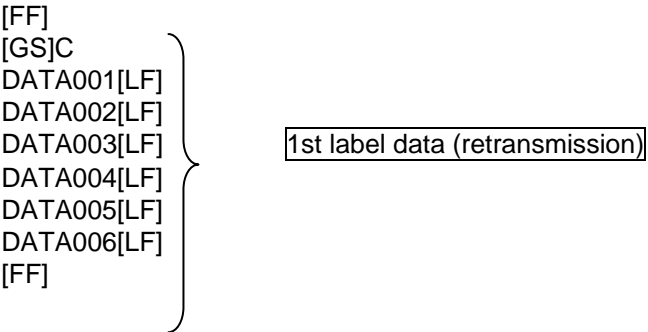

(5) When interrupting communication while the Page Mode Command is running, issuing the Page Mode Print Command during retransmission and then retransmitting data from the beginning,

1st transmission:



2nd transmission:

Issues the Page Mode Print Command and transmits data from the beginning.

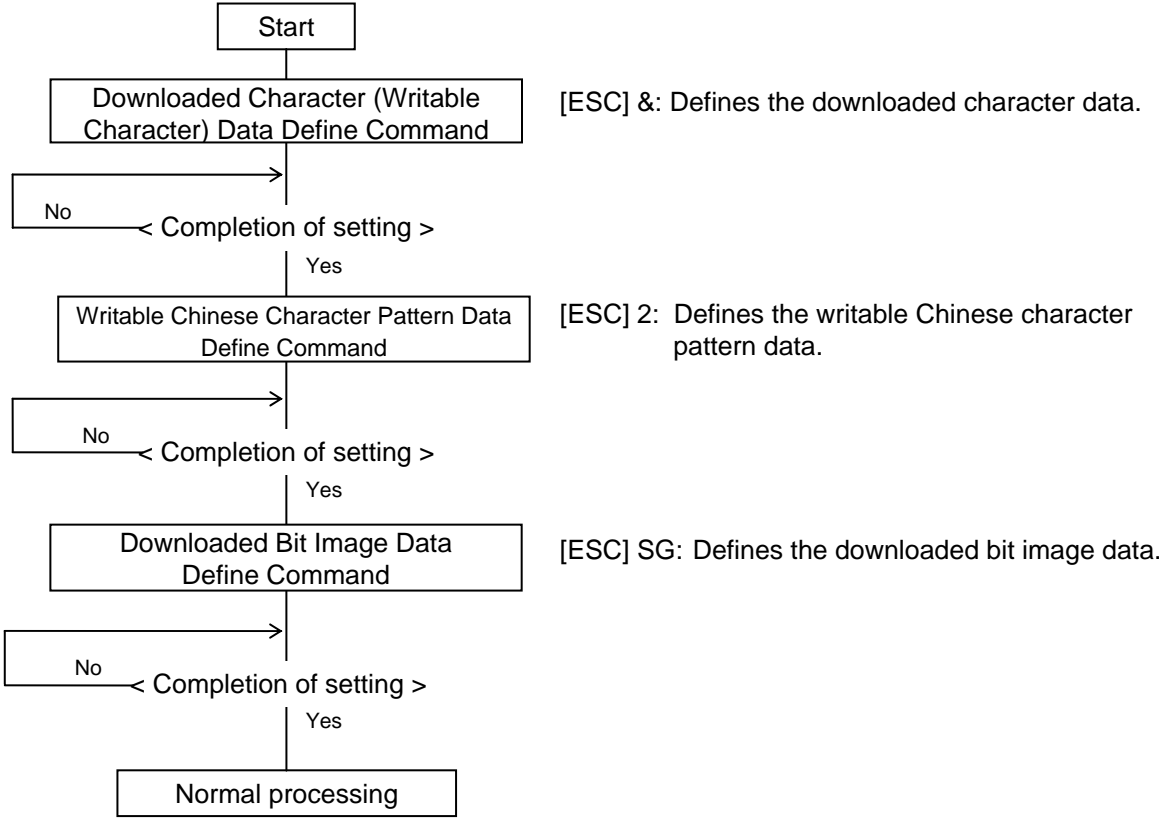


Print result: Data is properly printed (as shown below).

```
1st label:
DATA001[LF]
DATA002[LF]
DATA003[LF]
DATA004[LF]
DATA005[LF]
2nd label:
DATA001[LF]
DATA002[LF]
DATA003[LF]
DATA004[LF]
DATA005[LF]
DATA006[LF]
```

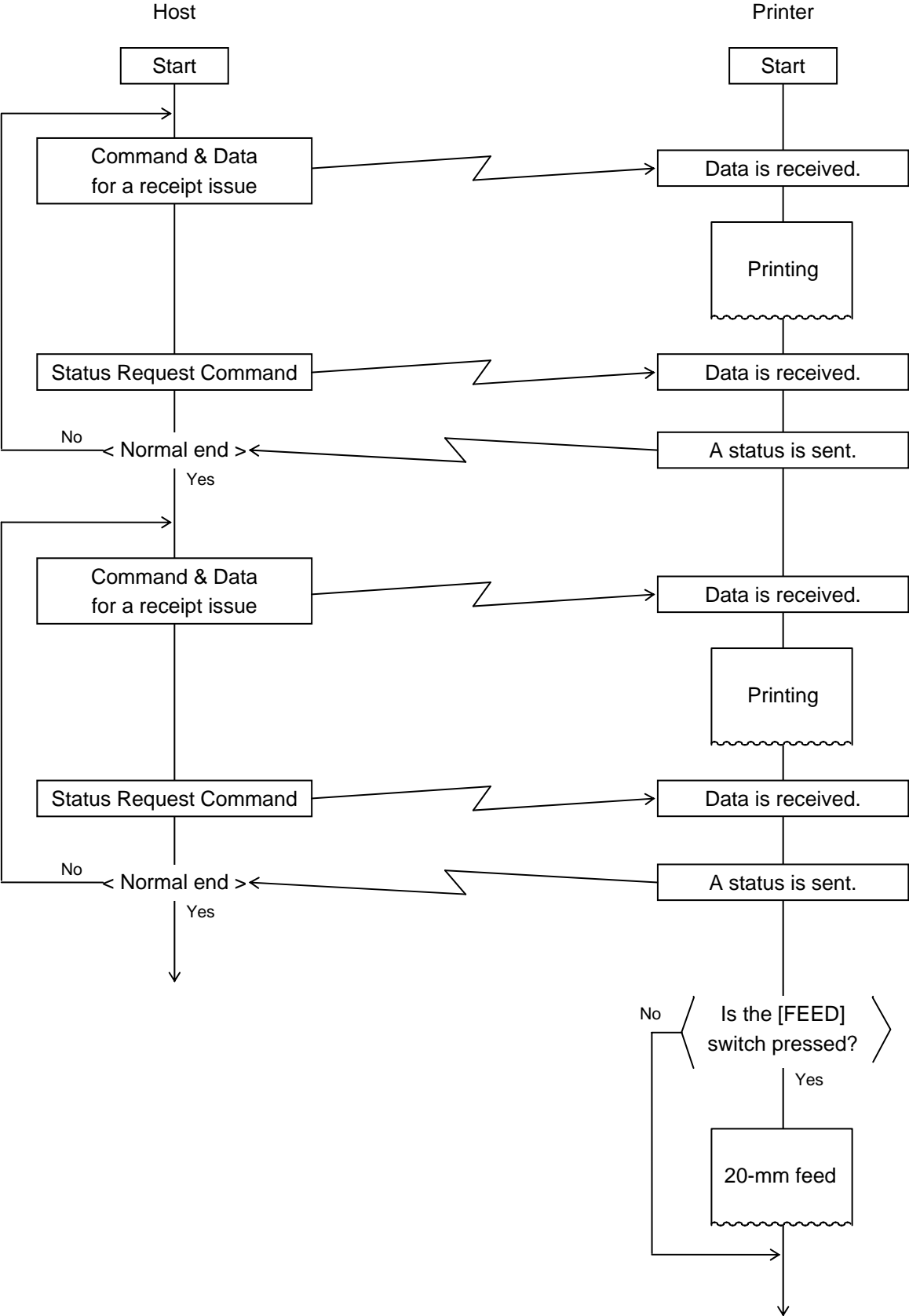
4.5 ESC/POS MODE

4.5.1 INITIAL SETTING

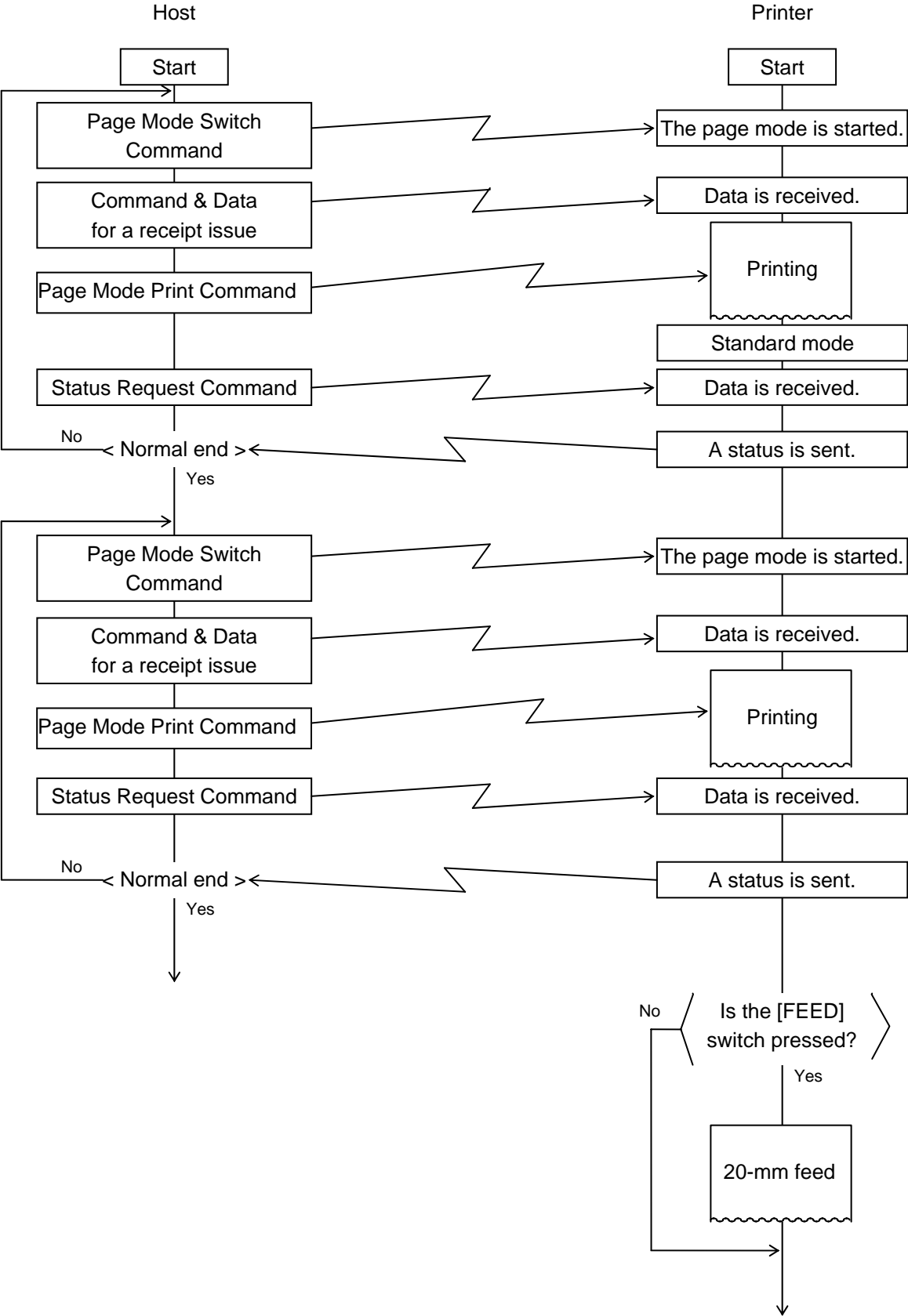


4.5.2 RECEIPT ISSUE OPERATION

4.5.2.1 STANDARD MODE



4.5.2.2 PAGE MODE



- NOTES:**
- (1) *In the ESC/POS mode, the status of issue end is not automatically sent. Before the next receipt is issued, whether or not the sent data is issued normally should be confirmed by sending the Status Request Command. When a receipt is not issued due to an error, the data should be sent again.*
 - (2) *In the ESC/POS mode, when the [FEED] switch is pressed, a 20-mm feed is performed.*
 - (3) *In the ESC/POS mode, the issue count cannot be set. If the batch/strip issue mode is set, it does not become effective.*

4.5.3 HANDLING OF RECEIVED DATA BY COMMAND

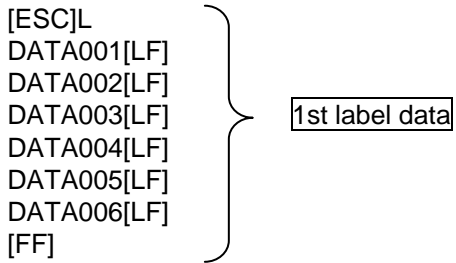
4.5.3.1 PAGE MODE PROCESSING

If communication is interrupted while data is transmitted from the application and no subsequent data is transmitted in the next transmission, a command error occurs. When transmission is cancelled while data is transmitted in page mode, the data may not be properly stored because data subsequently transmitted is processed in page mode unless the Page Mode Terminate Command [FF] or Page Mode Cancel Command [CAN] is issued before the transmission is cancelled. If communication is interrupted while data is transmitted in page mode, it is necessary to issue the Page Mode Terminate (Print) Command or Page Mode Cancel Command, turn off and on the power of the printer, or reset the printer.

However, please note that when the Page Mode Terminate (Print) Command is issued, all previous data is erased.

[Command transmission and print results (Examples)]

(1) When transmitting data in page mode as usual,

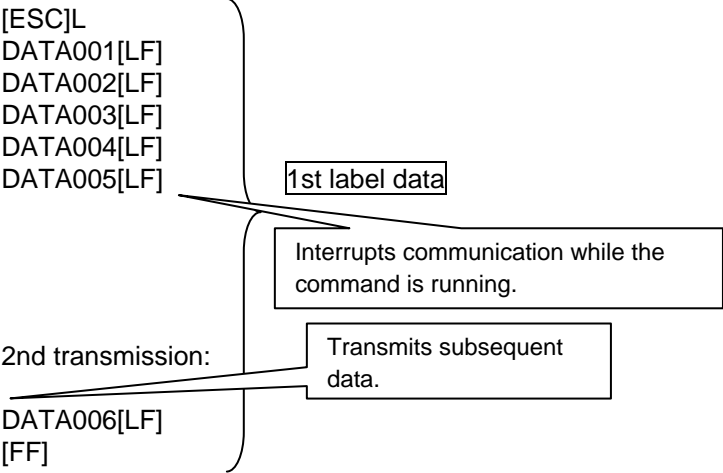


Print result: Data is properly printed (as shown below).

```
DATA001[LF]
DATA002[LF]
DATA003[LF]
DATA004[LF]
DATA005[LF]
DATA006[LF]
```

(2) When interrupting communication while the Page Mode Command is running, and then transmitting subsequent data,

1st transmission:

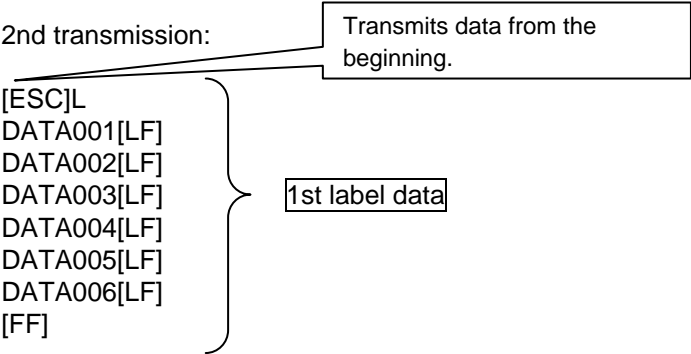
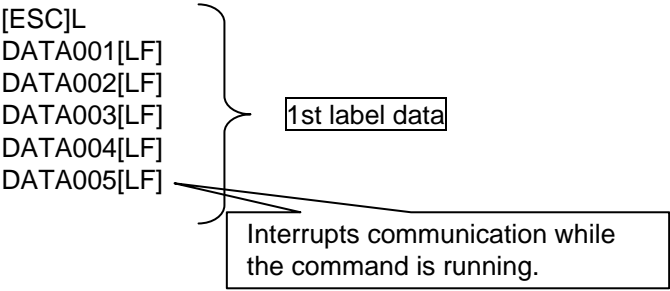


Print result: Data is properly printed (as shown below).

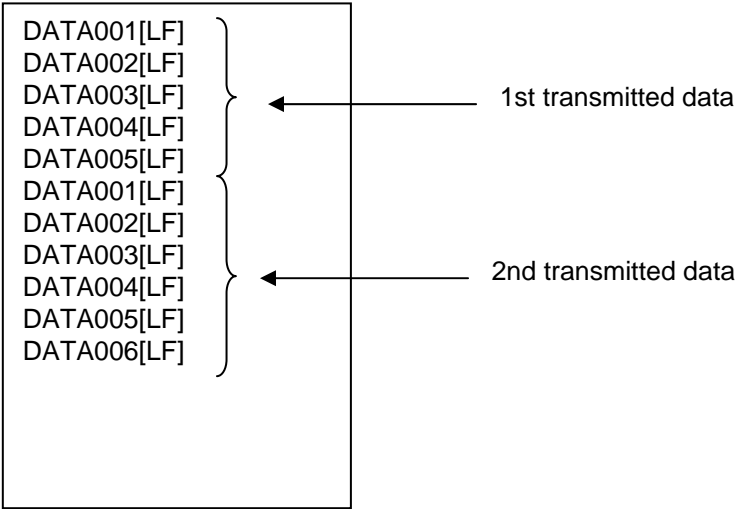
```
DATA001[LF]  
DATA002[LF]  
DATA003[LF]  
DATA004[LF]  
DATA005[LF]  
DATA006[LF]
```

(3) When interrupting communication while the Page Mode Command is running, and then retransmitting data from the beginning,

1st transmission:

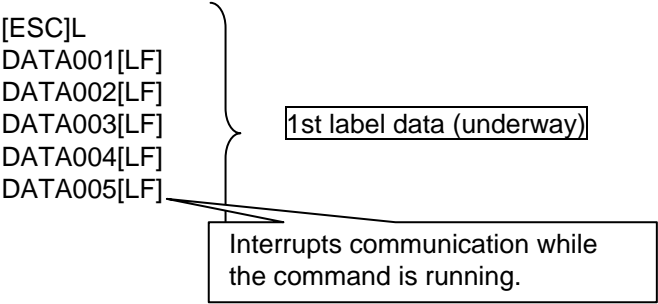


Print result: Data is printed but the printed output does not look correct (as shown below).

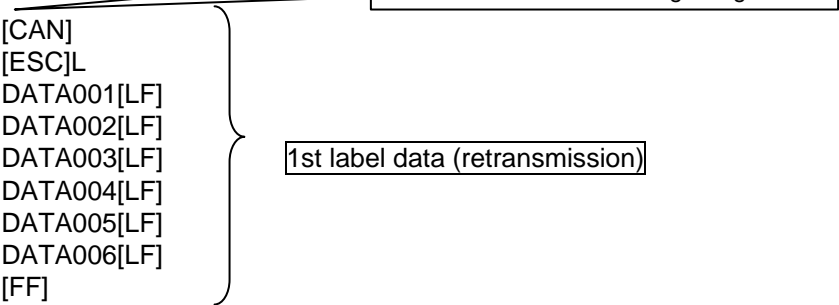


(4) When interrupting communication while the Page Mode Command is running, issuing the Cancel Command during retransmission and then retransmitting data from the beginning,

1st transmission:



2nd transmission:

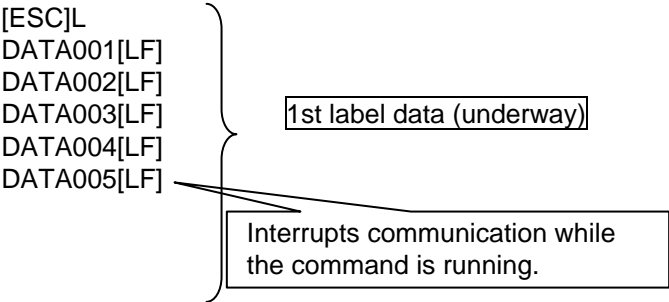


Print result: Data is properly printed (as shown below).

```
DATA001[LF]
DATA002[LF]
DATA003[LF]
DATA004[LF]
DATA005[LF]
DATA006[LF]
```

(5) When interrupting communication while the Page Mode Command is running, issuing the Page Mode Print Command during retransmission and then retransmitting data from the beginning,

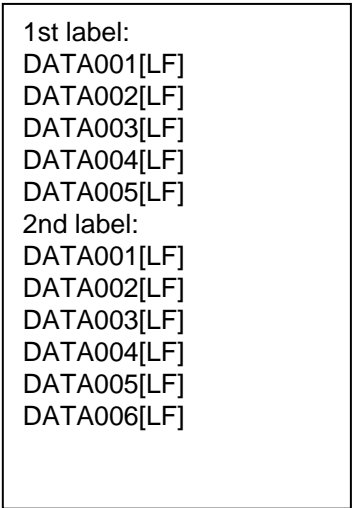
1st transmission:



2nd transmission:



Print result: Data is properly printed (as shown below).



5. TPCL MODE (INTERFACE COMMANDS)

5.1 GENERAL DESCRIPTION

This chapter describes details regarding the interface commands for the TPCL mode of the print mode.

<<Up to V1.0C>>

There are three issue types, “Batch issue,” “Strip issue” and “Linerless issue.” In batch issues, a back feed is performed before printing, regardless of the selected sensor type. No back feed is performed even in batch issue mode if there is no data to be printed within 9.3 mm from the top of the effective print length.

In strip and linerless issue modes, no back feed is performed.

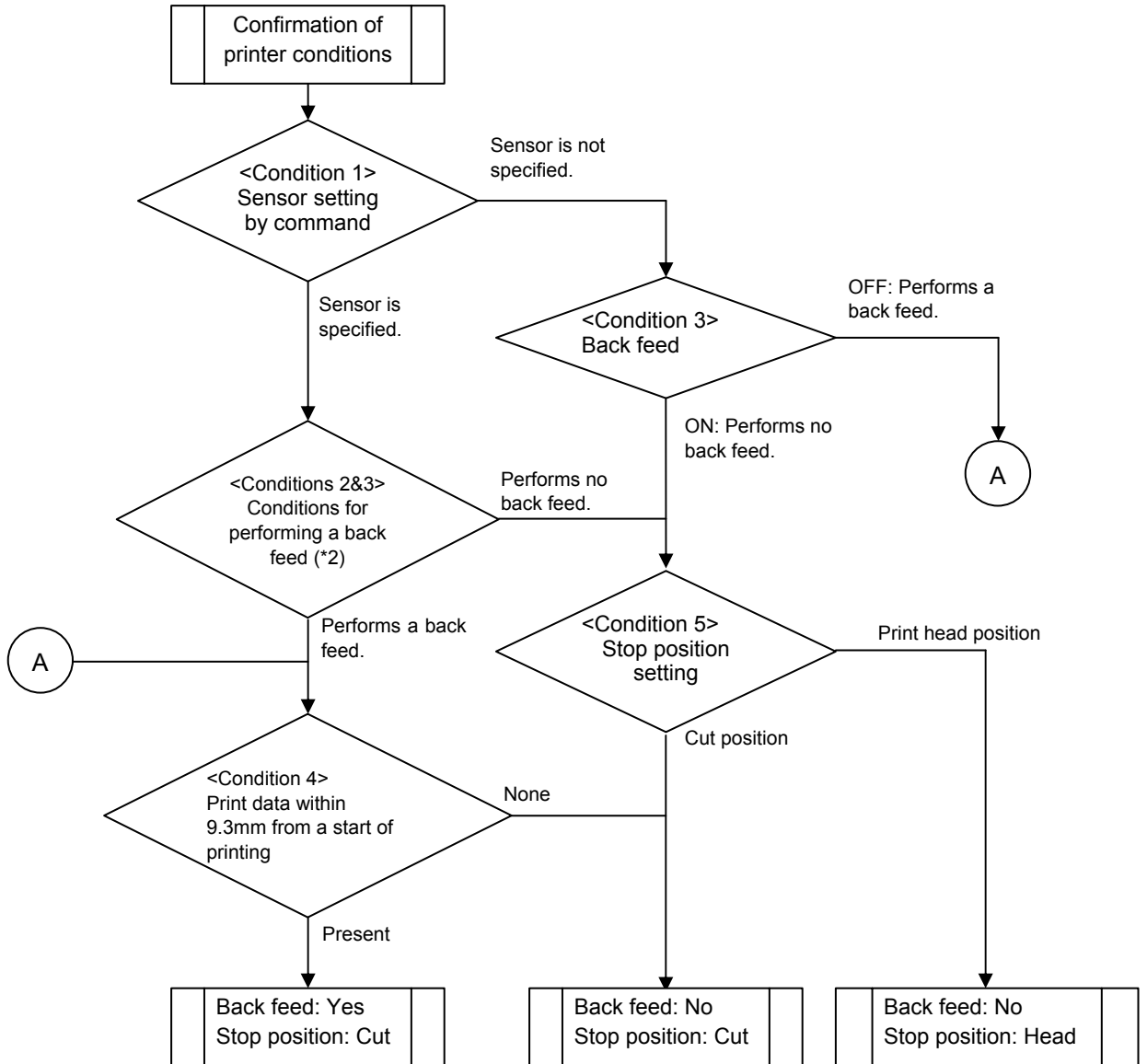
<<V1.0E or later>>

Whether or not to perform a back feed and the stop position (Cut/Print head) depend on the conditions as follows:

Mode	Linerless label issue	<Condition 1> Sensor setting by command (*1)	<Condition 2> Label pitch	<Condition 3> Back feed restriction in the system mode	<Condition 4> Print data within 9.3mm from a start of printing	<Condition 5> Stop position specified in the system mode	Printer behavior	
							Back feed	Stop position
Batch	OFF (Disabled)	Sensor is specified.	Label pitch: Less than 20.0mm	OFF (Performs a back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
				ON (Performs no back feed)	Present/None	Cut	No	Cut
					Head	No	Head	
				OFF (Performs a back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
			Label pitch: 20.0mm or above, but less than 24.0mm, and Effective print length: Less than 15.0mm	ON (Performs no back feed)	Present/None	Cut	No	Cut
					Head	No	Head	
				OFF/ON (Performs a back feed/no back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
				OFF/ON (Performs a back feed/no back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
		Label pitch: 20.0mm or above, but less than 24.0mm, and Effective print length: 15.0mm or above	OFF/ON (Performs a back feed/no back feed)	Present	Cut/Head	Yes	Cut	
				None	Cut/Head	No	Cut	
OFF/ON (Performs a back feed/no back feed)	Present		Cut/Head	Yes	Cut			
	None		Cut/Head	No	Cut			
OFF/ON (Performs a back feed/no back feed)	Present/None		Cut	No	Cut			
	Head		No	Head				
Label pitch: 24.0mm or above	OFF/ON (Performs a back feed/no back feed)	Present	Cut/Head	Yes	Cut			
		None	Cut/Head	No	Cut			
	OFF/ON (Performs a back feed/no back feed)	Present	Cut/Head	Yes	Cut			
		None	Cut/Head	No	Cut			
	OFF/ON (Performs a back feed/no back feed)	Present/None	Cut	No	Cut			
		Head	No	Head				
Label pitch set for FEED key and Feed command: 11.5mm or less	Sensor is not specified.	/	/	OFF (Performs a back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
				ON (Performs no back feed)	Present/None	Cut	No	Cut
					Head	No	Head	
				OFF (Performs a back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
ON (Enabled)	/	/	/	ON (Performs no back feed)	Present/None	Cut	No	Cut
					Head	No	Head	
				OFF (Performs a back feed)	Present	Cut/Head	Yes	Cut
					None	Cut/Head	No	Cut
	ON (Performs no back feed)	Present/None	Cut	No	Cut			
		Head	No	Head				

*1: Issue command and Feed command

[Reference] Flowchart for determining whether to perform a back feed and the stop position (Batch issue)



(*2): Whether to perform a back feed or not is determined depending on the combination of Conditions 2 and 3.

Conditions for performing a back feed		Back feed
<Condition 2> Label pitch	<Condition 3> Back feed restriction in the system mode	
Less than 20.0mm	OFF (Performed.)	Performed.
	ON (Not performed.)	Not performed.
20mm or above, but less than 24.0mm, and Effective print length: Less than 15.0mm	OFF (Performed.)	Performed.
	ON (Not performed.)	Not performed.
20mm or above, but less than 24.0mm, and Effective print length: 15.0mm or above	OFF (Performed.)	Performed.
	ON (Not performed.)	Performed.
24.0mm or above	OFF (Performed.)	Performed.
	ON (Not performed.)	Performed.
Label pitch set for FEED key and Feed command: 11.5mm or less	OFF (Performed.)	Performed.
	ON (Not performed.)	Performed.
Label pitch set for FEED key and Feed command: Over 11.5mm	OFF (Performed.)	Not performed.
	ON (Not performed.)	Not performed.

When the back feed restriction setting is on and the label pitch or effective print length conforms to the condition not to perform a back feed, a label located between the head and cutter at the first printing subsequent to an issue (one or multiple labels) cannot be printed because no back feed is performed. This waste can be prevented by switching the stop position in the SYSTEM mode from "CUT" to "HEAD." However, it is necessary to press the FEED key and move a label to the cut position to take it out because the label is not stopped at the cut position after printing has been completed.

In strip issue mode when the strip issue back feed setting is on and the strip position fine adjustment is set to – (negative), a back feed is performed to set the next label to the correct print start position. However, for labels whose label-to-label gap is 5 mm or more, no back feed is performed because adjustment of the print start position is not required.

<<Common in all versions>>

When printing is performed under the following conditions, the print position is misaligned:

In batch issues, use and issue labels shorter than 11.5 mm between the head and sensor, without setting or by omitting to set a back feed parameter of the print position fine adjust command in LABEL mode. Then, switch the mode to TPCL mode and issue labels. As a result, the print position of the second label is misaligned. When labels shorter than the distance between the head and sensor are used, before LABEL mode is switched to TPCL mode, the gap between the first label and second label has passed through the sensor before the first label is printed. Therefore, the third and later labels are printed at the proper position.

Either of the language types, Kanji, Chinese and Korean, can be implemented. Any font other than the on-board fonts is selectable.

5.2 OUTLINE OF COMMANDS

5.2.1 FORMAT OF INTERFACE COMMAND

ESC	Command & Data	LF	NUL
-----	----------------	----	-----

- The length from [ESC] to [LF] [NUL] must be as specified by each command.
- There are the following two kinds of control codes:
 - ① ESC (1BH), LF (0AH), NUL (00H)
 - ② { (7BH), | (7CH), } (7DH)

5.2.2 HOW TO USE REFERENCE

Function	Describes the outline of the function of the command.
Format	Shows the format of the command. The format designation method should conform to the following rules: <ul style="list-style-type: none"> ● Each set of small letters (such as aa, bbbb) indicates a parameter item. ● Parenthesized items may be omitted. ● “---” indicates the repetition of an item. ● Brackets and parentheses are used only in coding, and must not be transmitted in practice. ● Other symbols must always be inserted at designated positions before being transmitted.
Term	Explains the term(s) used in the format. * “0 to 999” described in the entry range indicates that up to 3-digit variable-length entry is allowed. (Entry of “001” or “009” is also possible.) “000 to 999” indicates that the entry must be fixed at 3 digits.
I/F	Indicates the interface that the command functions. All interfaces are available when not described.
Explanation	Explains the command in detail.
Note	Supplementary explanation of the command.
Refer to	Related commands
Examples	Explains the command examples.

[ESC] T20C30 [LF] [NUL]

The above corresponds to the transfer of the following:

1B 54 32 30 43 33 30 0A 00
[ESC] T 2 0 C 3 0 [LF] [NUL]

5.2.3 PRECAUTIONS

The commands and parameters described in this specification must always be used. If any command or parameter other than those covered in this specification is used, the printer's operation will not be guaranteed. When a command is transmitted in the SYSTEM mode, no operation is performed. However, only the reset command is operable.

5.3 COMMANDS RELATED TO SETTING

5.3.1 LABEL SIZE SET COMMAND

[ESC] D

Function	Sets the size of a label or tag paper.
Format	[ESC] Daaaa, bbbb, cccc (, dddd) [LF] [NUL]
Term	<p>aaaa: Pitch length of the label or tag 4 and 5 digits (in 0.1 mm units) 4 digits: 0100 (10.0 mm) to 9999 (999.9 mm) 5 digits: 00100 (10.0 mm) to 09999 (999.9 mm)</p> <p>bbbb: Effective print width Fixed at 4 digits (in 0.1 mm units) 0100 (10.0 mm) to 1057 (105.7 mm)</p> <p>cccc: Effective print length 4 and 5 digits (in 0.1 mm units) 4 digits: 0070 (7.0 mm) to 9970 (997.0 mm) 5 digits: 00070 (7.0 mm) to 09970 (997.0 mm)</p> <p>dddd: Reserved area (Omissible) Fixed at 4 digits 0300 to 1120</p>

The size varies according to the type of thermal head.

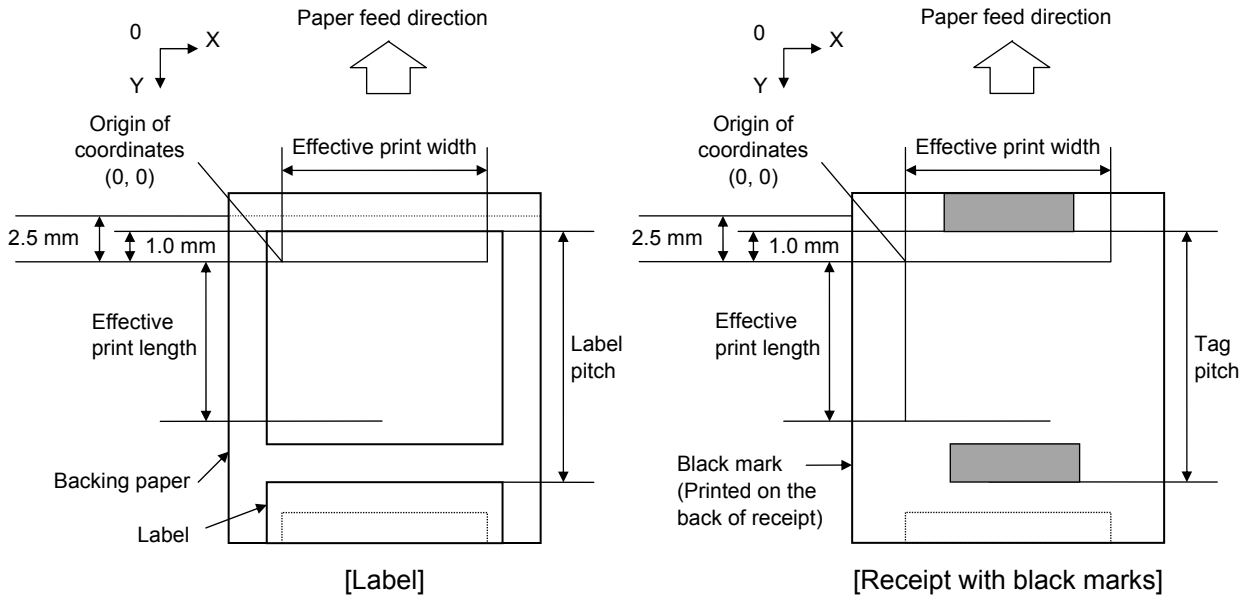
	B-EP2DL-GHxx	B-EP4DL-GHxx
Label pitch/tag pitch	10 x 999.9 mm	10 x 999.9 mm
Effective print width	48.0 mm	104.0 mm
Effective print length	997.0 mm	997.0 mm

Explanation

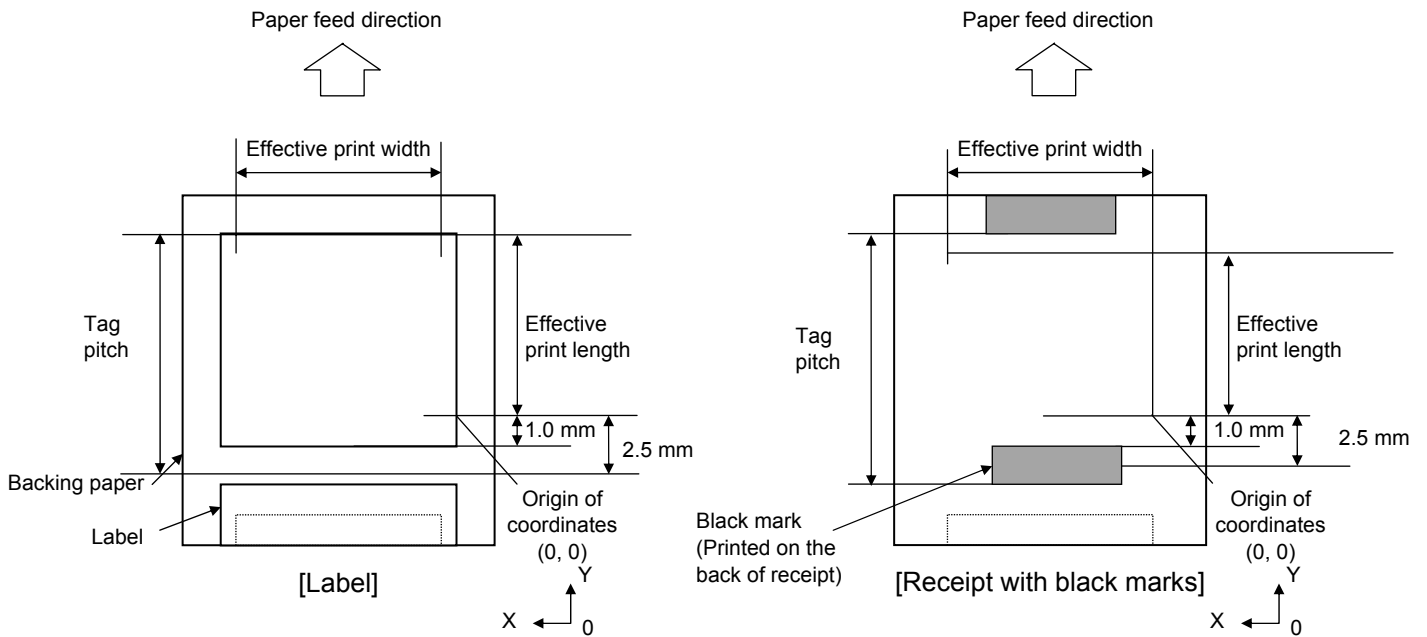
- (1) When the value exceeds the maximum value, it should be changed to the maximum value. When the effective print width exceeds the maximum width of each thermal head, it should be changed to the maximum width of the thermal head.
- (2) When the value is the minimum value or less, it should be changed to the minimum value.
- (3) The reserved area is not checked. However, only the values within the above range should be applied.
- (4) In the compatible mode for the B-SP series, the effective print width is fixed at 48.0 mm.

When the compatible mode for the B-SP series is off

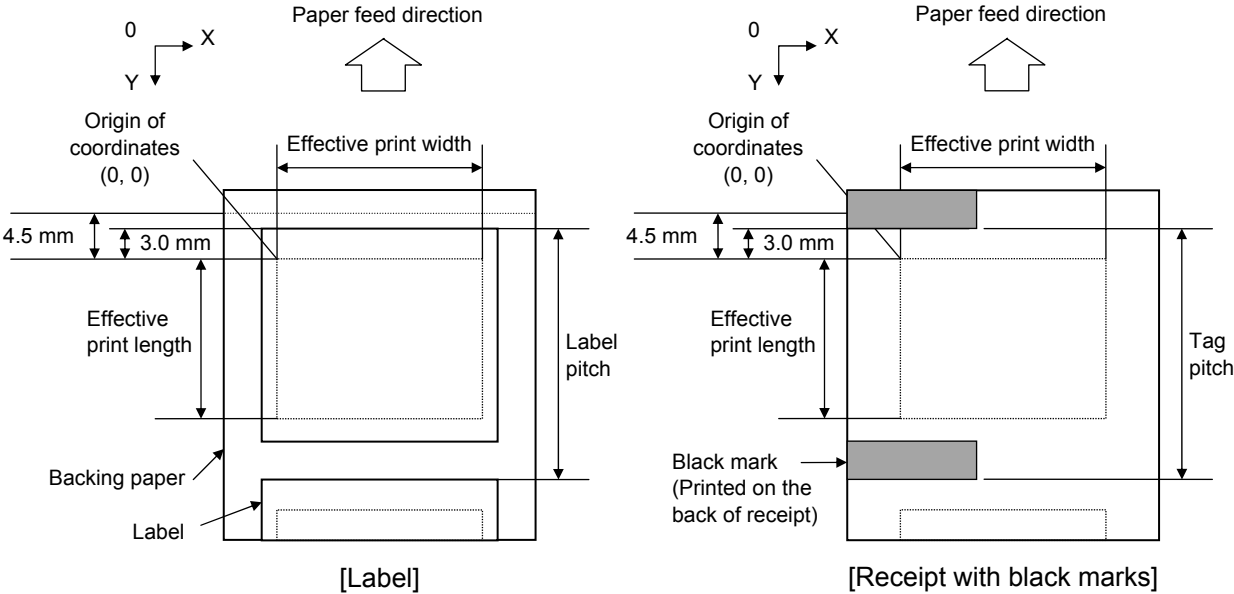
<Top first printing>



<Bottom first printing>



When the compatible mode for the B-SP series is on
* Top first printing only



Programmable value range by the software

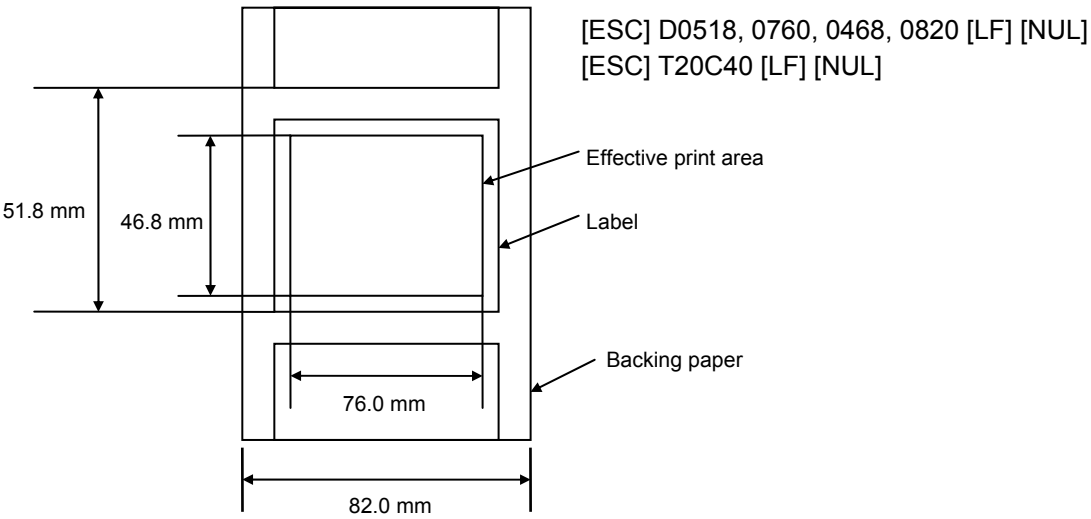
[mm]

Item		Model	B-EP2DL		B-EP4DL	
			203 dpi		203 dpi	
		Mode	Batch	Strip	Batch	Strip
Thermal head dot density			8 dots/mm		8 dots/mm	
Thermal head width			48.0 mm		104.0 mm	
Pitch	Label	Max.	10.0	13.0	10.0	13.0
		Min.	999.9	67.0	999.9	67.0
	Tag	Max.	10.0	-	10.0	-
		Min.	999.9	-	999.9	-
Label length		Max.	7.0	10.0	7.0	10.0
		Min.	997.0	60.0	997.0	60.0
Paper length	Backing paper	Max.	16.0		50.0	
		Min.	58.0		115.0	
	Tag	Max.	16.0	-	50.0	-
		Min.	58.0	-	115.0	-
Label width		Max.	13.0		47.0	
		Min.	55.0		112.0	
Label-to-label gap		Max.	3.0		3.0	
		Min.	7.0		7.0	
Black mark length		Max.	3.0		3.0	
		Min.	7.0		7.0	
Effective print width		Max.	10.0		10.0	
		Min.	48.0		104.0	
Effective print length	Label	Max.	7.0	10.0	7.0	10.0
		Min.	997.0	60.0	997.0	60.0
	Tag	Max.	7.0	-	7.0	-
		Min.	997.0	-	997.0	-
Slow-up/down interval	Slow up	1.0		1.0		
	Slow down	1.0		1.0		
Paper thickness	Label	100 μm to 120 μm				
	Tag	120 μm				
	Receipt	65 μm to 75 μm				
Max. effective print length for on-the-fly issuing			997.0		499.0	

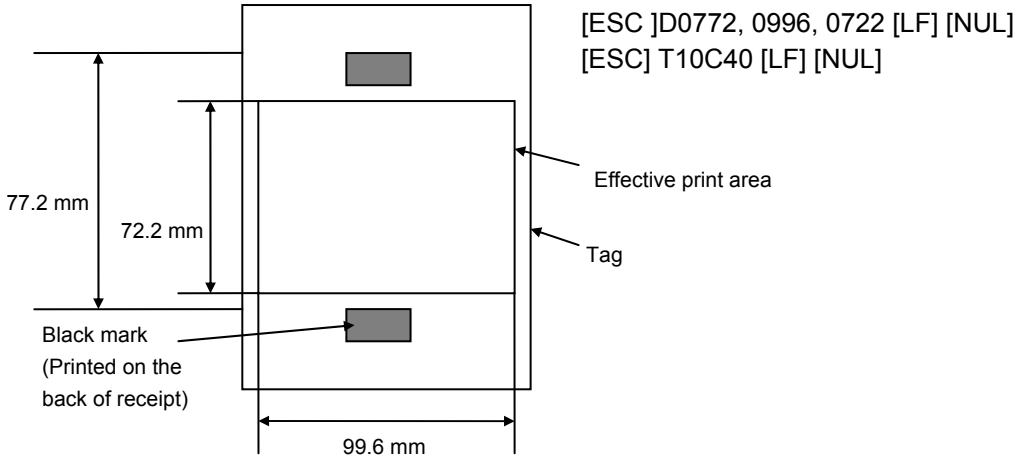
Notes

- (1) When the label size or type of sensor is changed, the Label Size Set Command must first be transmitted.
- (2) The label pitch length is backed up in memory (retained even if the power is turned off).
- (3) After sending the Label Size Set Command, one sheet of paper must be fed by the Feed Command ([ESC] T), to align the paper with the first print position prior to printing.
- (4) The origin of drawing coordinates is determined according to the parameters of the Label Size Set Command as shown in Figure 4.
Refer to PRINT POSITION FINE ADJUST COMMAND for the print stop position in strip issues.
- (5) Printing cannot be performed in the slow up (1 mm) and slow down (1 mm) areas. Consequently, [A: Label, tag pitch] – [H: Effective print length] ≥ 2 mm must be assumed.
- (6) The origin of drawing coordinates and the print stop position (print head position when printing stops) are adjustable by the Fine Adjust Commands and according to the fine adjustment value settings in the SYSTEM mode.
- (7) When label paper is used to align the top first and bottom first print positions, (Effective print length = Label pitch – Gap – 2 mm (slow up (1 mm), slow down (1 mm) areas) should be specified.
- (8) The parameters should be as shown in the figure and table. When any parameter or paper out of the range is specified, printing is not properly performed or an error occurs.
- (9) When a gap or a black mark cannot be detected within less than 150% of the label pitch length, it is assumed to be a paper jam error.
- (10) Even if a gap or a black mark is detected within less than 90% of the effective print length specified by the Label Size Set Command, it is ignored.
- (11) Where the effective print length is specified within the “max. effective print length for on-the-fly issuing,” non-stop batch printing is possible even if the data to be printed is different from each other because printing and drawing of the next label are processed at the same time. [On-the fly issue]
However, printing may stop every label depending on the volume of drawing data.
- (12) After transmitting this command, the image buffer must be cleared using the Image Buffer Clear Command.
- (13) When the print position is changed or the gap between the labels is not 3 mm, the Print Position Fine Adjust Command should be used as required. (When the gap between the labels is 3 mm, the standard print start position is 1 mm from the top of the label. = When the compatible mode for the B-SP series is off.)
(When the gap between the labels is 3 mm, the standard print start position is 3 mm from the top of the label. = When the compatible mode for the B-SP series is on.)

Examples (1) Label



(2) Tag



Refer to • Image Buffer Clear Command ([ESC]C)

5.3.2 PRINTER ID SET COMMAND

[ESC] ID

Function	Sets the ID for the printer.
Format	[ESC] ID ; aa,(b) [LF] [NUL]
Term	aa: Printer ID (2-byte hex data) 0000H to FFFFH b: Reserved area (Omissible) Fixed at 0.

Explanation

- (1) The printer ID is the information required for the host, such as IrDA: TEC Protocol, to identify each printer.
- (2) When any value other than 0 is specified in the reserved area, an error occurs.

Notes

- (1) The set printer ID is backed up in memory (retained even if the Reset Command ([ESC] WR) is executed or the power is turned off).
- (2) The last 5 digits of the printer's serial number have been set as the printer ID, at the time of shipment from the factory.
- (3) In IrDA: TEC Protocol, the printer checks the set ID against the ID in the received command packet. If they do not match, the printer discards the command packet. However, when the ID in the command packet is "0," the printer accepts the command packet without checking the set IDs.

Example

To set "03H 51H" as the ID of the printer:

[ESC] ID; [03H] [51H] [LF] [NUL]

In this case, the printer ID in status printing is "00849."

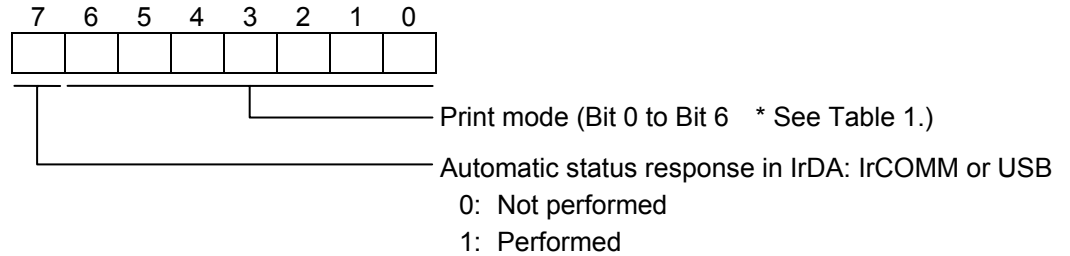
5.3.3 MODE SELECT COMMAND

[ESC] M

Function Changes the print mode.

Format [ESC] M; a (,b) [LF] [NUL]

Term a: Print mode designation



* Table 1 Print mode

HEX	Mode	How to deal with the received data after an error is cleared
30H	LABEL	Discards
31H	RECEIPT	Discards
32H	RECEIPT1	Continues printing
34H	ESC/POS	Continues printing
41H	TPCL	Continues printing
42H	TPCL1	Continues printing

b: Print position detection feed (Omissible. If omitted, the print position detection feed is not performed.)

0: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is not performed after the mode is changed.

1: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is performed after the mode is changed.

Explanation

- (1) There are 4 types of the print mode: "LABEL," "RECEIPT," "TPCL" and "ESC/POS."
- (2) "Automatic status response in IrDA: IrCOMM" or USB is the function for the specifications which do not allow the printer to spontaneously send the status through IrDA; IrCOMM or USB. This function enables the printer to forcefully send the status to the host, if the link between the printer and the host is established. However, if the link between the printer and the host is not established upon the status transmission, the printer cannot send the status. Therefore, the status is discarded. (In the next connection to the host, the printer does not send the status to the host.)
- (3) The sensor is not used in the RECEIPT, RECEIPT1 or ESC/POS mode. When sensor detectable paper is used for receipts and labels, print position detection feed cannot be done in the LABEL, TPCL or TPCL1 mode. By setting the print position detection feed parameter to 1, print position detection feed is carried out after the mode is changed to LABEL, TPCL or TPCL1.
- (4) In the TPCL1 mode, it is possible to re-print the last print data by pressing the FEED button.

Notes

- (1) The print mode designation (the specified print mode and the automatic status response in IrDA: IrCOMM or USB) is backed up in memory (retained even if the power is turned off).
- (2) The factory default is "TPCL mode" and "Automatic status response in IrDA: IrCOMM or USB is not performed." (The IrDA protocol is "IrCOMM.")
- (3) When the print mode is changed, the type of sensor is automatically changed.

LABEL mode (0):	The previously backed up sensor is designated.
TPCL mode (A):	The previously backed up sensor is designated.
TPCL1 mode (B):	The previously backed up sensor is designated.
RECEIPT mode (1):	No sensor is designated.
RECEIPT1 mode (2):	No sensor is designated.
ESC/POS mode (4):	No sensor is designated.
- (4) If the RECEIPT or ESC/POS mode is selected or no sensor is designated in the LABEL or TPCL mode, an initial feed is not performed when the cover is closed (when the key operation or Set Command ([ESC]ZM03) is used to enable the print position detection feed setting after closing the cover.)
- (5) When the mode change is finished, the printer sends the normal end status or an ACK to the host. However, when the mode is changed to the TPCL mode, the printer does not send the status. In IrDA: IrCOMM or USB, only when bit 7 of the print mode designation is set to "1," the printer sends the status.
- (6) The print mode can be changed by the printer itself. However, since the setting for the automatic status response in IrDA: IrCOMM or USB cannot be changed, the setting remains as the same.
- (7) The print position detection feed is performed according to the conditions, such as, label pitch, fine adjustment, and sensor selection, which were set in the LABEL or TPCL mode before the printer is operated in the RECEIPT, RECEIPT1 or ESC/POS mode. If no sensor is selected, the print position detection feed will not be performed.
- (8) After performing a print position detection feed, the printer does not send a process end status. If an error occurs during the print position detection feed, the print position detection feed is performed after the error is cleared by using the PAUSE key (when the key operation or Set Command ([ESC]ZM03) is used to enable the print position detection feed setting after closing the cover.)
- (9) When changing the print mode by the printer itself, the print position detection feed parameter cannot be set.
- (10) When the mode select command is designated with the print position detection feed at the end of a print data issued in the RECEIPT1 or ESC/POS mode, and if an error occurs while printing, the printing will restart after the error is cleared and then, the print mode will be changed to the LABEL or TPCL mode and a print position detection feed is performed. When the print position detection feed is omitted, the print mode will not be changed to the LABEL or TPCL mode. (The mode select command is discarded.)
- (11) When the LABEL or TPCL mode is selected in the mode select command and the print position detection feed parameter is set 0 (not performed), and if an error occurs while the printer issues in the RECEIPT1 or ESC/POS mode, the print mode is changed to the LABEL or TPCL mode after the error is cleared. (The mode select command is executed.)

5.4 COMMANDS RELATED TO FINE ADJUSTMENT

5.4.1 PRINT START POSITION FINE ADJUST COMMAND [ESC] AX

Function	Adjusts the feed value so that the label will be shifted forward or backward from the automatically positioned print start position.
Format	[ESC] AX; abbb, cddd, eff (, ghhh) [LF] [NUL]
Term	<p>a: Indicates the direction of the print position, forward or backward, in which a fine adjustment is to be made. +: Backward -: Forward</p> <p>bbb: Fine adjustment value for print position 000 to 500 (in 0.1 mm units)</p> <p>c: Indicates the direction of the strip position, forward or backward, in which a fine adjustment is to be made. +: Backward -: Forward</p> <p>ddd: Fine adjustment value for strip position 000 to 030 (in 0.1 mm units) * In - (Forward) a fine adjustment is to be made between 000 and 020.</p> <p>e: Reserved area Fixed at +.</p> <p>ff: Reserved area Fixed at 00.</p> <p>g: Reserved area (Omissible)</p> <p>hhh: Reserved area (Omissible)</p>

[Compatible mode for the B-SP series]

a:	Indicates the direction of the print position, forward or backward, in which a fine adjustment is to be made. +: Backward -: Forward
bbb:	Fine adjustment value for print position 000 to 500 (in 0.1 mm units)
c:	Reserved area Fixed at +.
ddd:	Reserved area Fixed at 000.
e:	Reserved area Fixed at +.
ff:	Reserved area Fixed at 00.

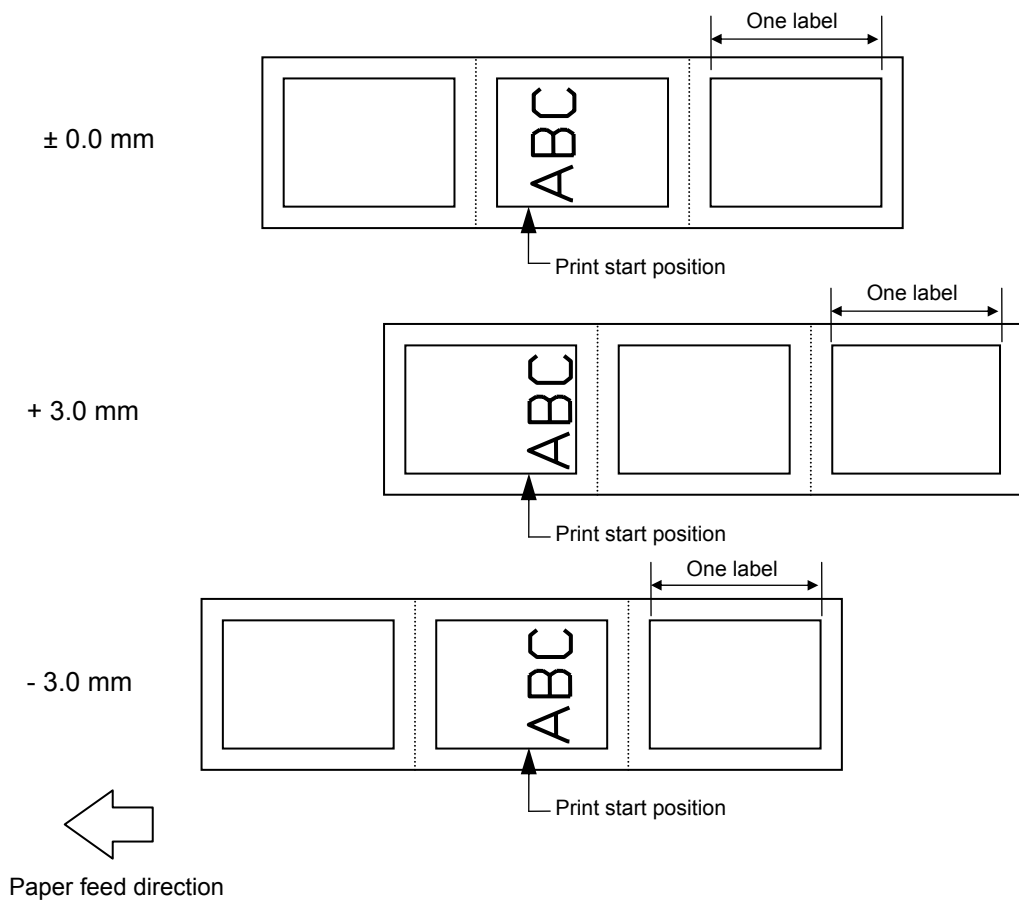
- g: Reserved area (Omissible)
- hhh: Reserved area (Omissible)

Explanation

- (1) When the parameter “a” is set to any value other than “+” or “-,” a command error occurs.
- (2) If any value out of the above range is specified for the fine adjustment value for print position, a command error occurs.
- (3) When any value above + 10.5 mm (- 1 mm distance between the head and sensor) is specified for the fine adjustment value for print position, it should be changed to + 10.5 mm before printing.
- (4) The reserved area is not checked.
- (5) The fine adjustment value for strip position is valid only when “the compatible mode for the B-SP series” is turned off (disabled) in the SYSTEM mode. When the parameter “a” is set to any value other than “+” or “-,” a command error occurs. When the parameter “a” is set to any value other than “+” or “-,” a command error occurs. When the “compatible mode for the B-SP series” is turned on (enabled), the value is ignored.

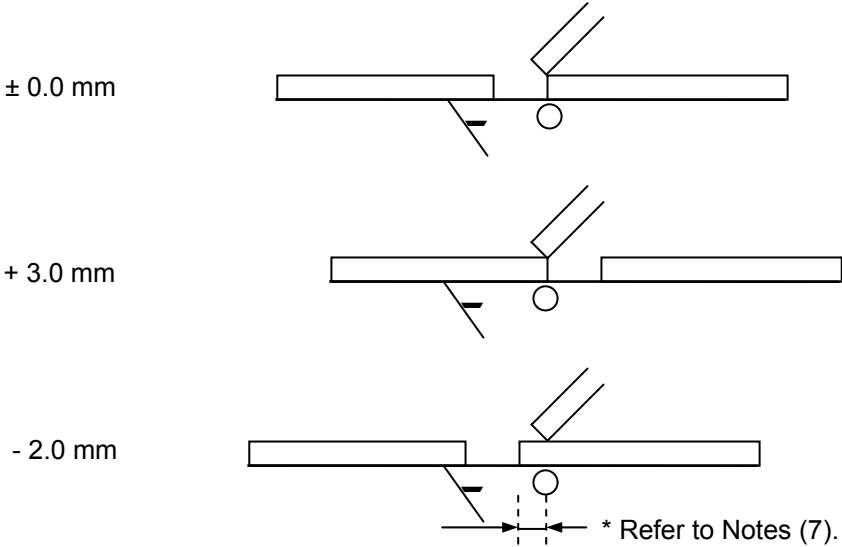
[Print position (feed value) fine adjustment]

(To finely adjust the print position so that it shifts backward or forward)

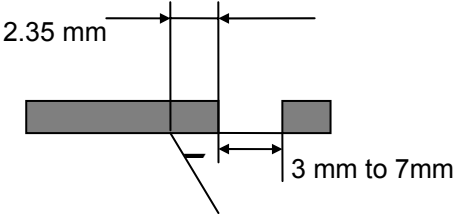
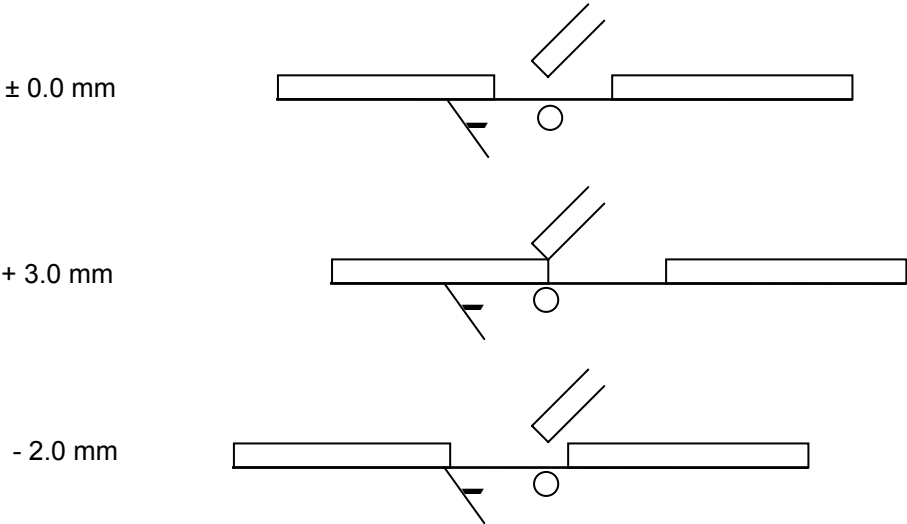


[Strip position fine adjustment]

When the label-to-label gap is 3 mm,



When the label-to-label gap is 7 mm,



- In strip issue mode, a label is stopped at the position where the distance between the leading edge of the strip shaft and the trailing edge of the label is 2.35 mm, regardless of the label-to-label gap. However, only when the fine adjustment value for print position is not selected (up to V1.0C).
- When the stop position is not proper, it should be adjusted using the strip position fine adjustment function.

Notes

- (1) The fine adjustment values are backed up in memory (retained even if the power is turned off).
- (2) The factory default value is 0.0 mm.
- (3) The fine adjustment values (print position, strip position) changed by the Print Position Fine Adjust Command in the LABEL mode, are also effective in the TPCL mode.
- (4) When print position and strip position fine adjustment is selected in the SYSTEM mode (through key operations on the printer), the fine adjustment value is a sum of the value in the fine adjustment command and the system mode fine adjustment value.

Note that the maximum fine adjustment value is as follows:

Print position fine adjustment:	± 50.0 mm
Strip position fine adjustment:	- 2.0 mm to + 3.0 mm

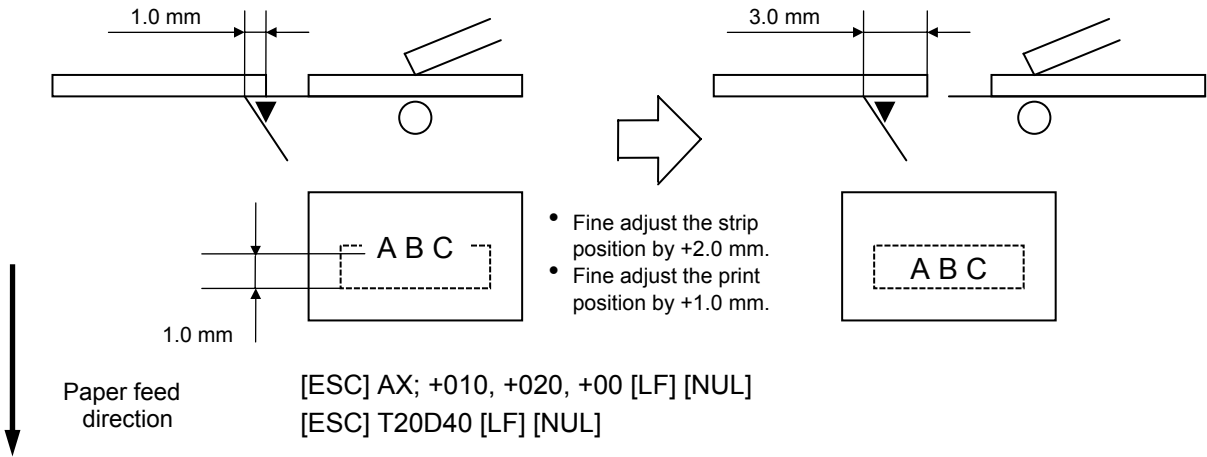
When the sum of the values exceeds ± 50.0 mm, the fine adjustment value for print position should be changed to ± 50.0 mm before printing.

When the sum of the values exceeds + 3.0 mm in the positive direction or falls below - 2.0 mm in the negative direction, the fine adjustment value for strip position should be changed to + 3.0 mm or - 2.0 mm before printing.

- (5) The fine adjustment for strip position is effective only in strip issues.
- (6) The fine adjustment value for strip position up to V1.0C is valid only when the fine adjustment value for print position is not selected (fine adjustment value = 0).
- (7) The fine adjustment value for strip position is selected in the negative direction, a label is stopped backward against the print start position. However, the print start position is misaligned by the set value because no back feed is performed in strip issue mode. (When the label-to-label gap is less than 5 mm) * Refer to the arrows for - 2.0 mm when the label-to-label gap is 3 mm in P.5-15.
- (8) When the label pitch length is 20.0 mm or more but less than 24.0 mm and the effective print length is 15.0 mm or more or the label pitch length is 24.0 mm or more, a back feed is performed before printing.

Examples

Strip issue



5.4.2 PRINT DENSITY FINE ADJUST COMMAND

[ESC] AY

Function	Adjusts the print density which was automatically set.
Format	[ESC] AY ; abb, c (, d) [LF] [NUL]
Term	<p>a: Indicates whether to increase or decrease the density +: Increase (darker) -: Decrease (lighter)</p> <p>bb: Fine adjustment value for print density 00 to 30 (in units of 1 step)</p> <p>c: Print mode 0: Reserved 1: Direct thermal</p> <p>d: Head output division designation (Omissible. If omitted, the backed up setting in memory is used.) 2-inch head width 0: Auto (Divided by 2 or 3) 1: Reserved (If specified, auto (Divided by 2 or 3)) 2: Fixed at Divided by 3 3: Auto1 (Not divided/Divided by 2 or 3)/Print quality oriented 4: Reserved (If specified, fixed at Divided by 3) 5: Auto2 (Not divided/Divided by 2 or 3)/Print speed oriented (supported in V1.0E or later)</p> <p>4-inch head width 0: Auto (Divided by 2, 3 or 6) 1: Reserved (If specified, auto (Divided by 2, 3 or 6)) 2: Reserved (If specified, auto (Divided by 2, 3 or 6)) 3: Auto1 (Not divided/Divided by 2, 3 or 6) 4: Fixed at Divided by 6</p>

Explanation

- (1) The standard density is finely adjusted to increase or decrease.
- (2) When any fine adjustment value for print density out of the range is set, a command error occurs.
- (3) If the print mode is set to any value other than "1: Direct thermal," it should be changed to "1."
- (4) The default value for the head output division designation is "3: Auto1 (Not divided, Divided by 2 or 3)" when the 2-inch print head is used and "3: Auto1 (Not divided, Divided by 2, 3 or 6)" when the 4-inch print head is used.
- (5) When "0: Auto" is designated for the 2-inch print head, "Divided by 3" or "Divided by 2" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching between "Divided by 2" and "Divided by 3." Therefore, do not designate "0: Auto" when a serial barcode is printed.
- (6) When "3: Auto1" or "5: Auto2" is designated for the 2-inch print head, "Not divided," "Divided by 3" or "Divided by 2" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among "Not divided," "Divided by 2" and "Divided by 3." Therefore, do not designate "3: Auto1" or "5: Auto2" when a serial barcode is printed.

The difference between Auto1 and Auto2 is while Auto1 is print quality oriented, Auto2 is print speed oriented. Auto2 is designated to increase the print speed although the print is slightly faded.

- (7) When "0: Auto" is designated for the 4-inch print head, "Divided by 6," "Divided by 3" or "Divided by 2" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among "Divided by 2," "Divided by 3" and "Divided by 6." Therefore, do not designate "0: Auto" when a serial barcode is printed.
- (8) When "3: Auto1" is designated for the 4-inch print head, "Not divided," "Divided by 6," "Divided by 3" or "Divided by 2" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among "Not divided," "Divided by 2" and "Divided by 3" and "Divided by 6." Therefore, do not designate "3: Auto1" when a serial barcode is printed.

Notes

- (1) The set fine adjustment value for print density and the head output division designation are backed up in memory (retained even if the power is turned off).
- (2) The fine adjustment values changed by the Print Density Fine Adjust Command in the TPCL mode, are also effective in the LABEL, RECEIPT or ESC/POS mode.
- (3) When the head output division designation is omitted, the backed up value in memory is used.
- (4) When print density fine adjustment is selected in the SYSTEM mode (through key operations on the printer), the fine adjustment value is a sum of the value in the fine adjustment command and the system mode fine adjustment value. Note that the maximum fine adjustment value is ± 30.0 mm

Examples

To set the density to - 2:

```
[ESC] AY; -02, 1 [LF] [NUL]
```

To set the density to + 3:

```
[ESC] AY; +03, 1 [LF] [NUL]
```

5.4.3 STRIP SENSOR ADJUST COMMAND

[ESC] AH

Function	Sets the sensor threshold value to switch the mode between strip and batch.
----------	---

Format	[ESC] AH; a [LF] [NUL]
--------	------------------------

Term	a: Setting 0: Operation in conformance with the strip sensor 1: Operation in conformance with the strip sensor 2: Fixed at the batch mode 3: Fixed at the strip mode 4: Reserved
------	---

Notes

- (1) The set parameter is backed up and kept until a parameter is set using this command. When the power is turned on, the backed up value is retrieved and set
- (2) "0: Operation in conformance with the strip sensor" has been set as the default at the time of shipment from the factory.
- (3) When either "2: Fixed at the batch mode" or "3: Fixed at the strip mode" for parameter "a," is selected, the printer operates in the specified mode, without automatically switching between the batch and strip modes.
- (4) When "4: Reserved" for parameter "a" is selected, this command is ignored.

5.5 COMMANDS RELATED TO CLEAR

5.5.1 IMAGE BUFFER CLEAR COMMAND

[ESC] C

Function	Clears the image buffer for drawing characters, lines, barcodes, and graphics.
----------	--

Format	[ESC] C [LF] [NUL]
--------	--------------------

Explanation

- (1) After changing the label size using the Label Size Set Command ([ESC] D), the image buffer must be cleared using this command.
(Unless this command is transmitted, the data drawn before changing the label size remains in the image buffer.)
- (2) The increment/decrement designation is effective until the Image Buffer Clear Command is transmitted.
- (3) The link field designation is effective until the Image Buffer Clear Command is transmitted.

Examples

[ESC] D0508, 0760, 0468 [LF] [NUL]

[ESC] T20C41 [LF] [NUL]

[ESC] C [LF] [NUL]

[ESC] PC000; 0080, 0065, 1, 1, A, +00, 00, B, J0000, M0, +0000000000, Z00, P1 [LF] [NUL]

[ESC] PC001; 0250, 0150, 1, 1, G, +00, 00, B, J0000, M0, +0000000000, Z00, P1 [LF] [NUL]

[ESC] RC000; ABC [LF] [NUL]

[ESC] RC001; DEF [LF] [NUL]

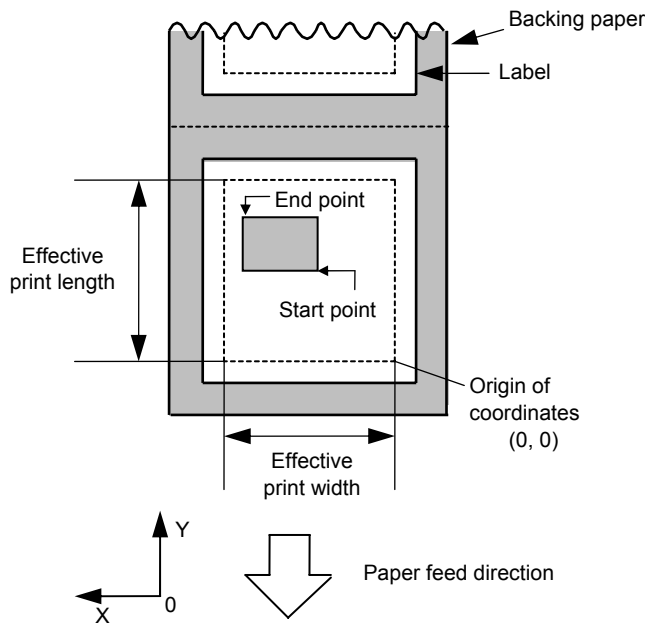
[ESC] XS; I, 0001, 0002C1000 [LF] [NUL]

5.5.2 CLEAR AREA COMMAND

[ESC] XR

Function	Clears the designated area or reverses the white/black dot pattern in the designated area in the drawing area.
Format	[ESC] XR; aaaa, bbbb, cccc, dddd, e [LF] [NUL]
Term	<p>aaaa: X-coordinate of the designated area start point Fixed at 4 digits (in 0.1 mm units)</p> <p>bbbb: Y-coordinate of the designated area start point 4 or 5 digits (in 0.1 mm units)</p> <p>cccc: X-coordinate of the designated area end point Fixed at 4 digits (in 0.1 mm units)</p> <p>dddd: Y-coordinate of the designated area end point 4 or 5 digits (in 0.1 mm units)</p> <p>e: Type of how to clear A: Clears the contents in the designated area to zeros. B: Reverses the white/black dot pattern in the designated area.</p>

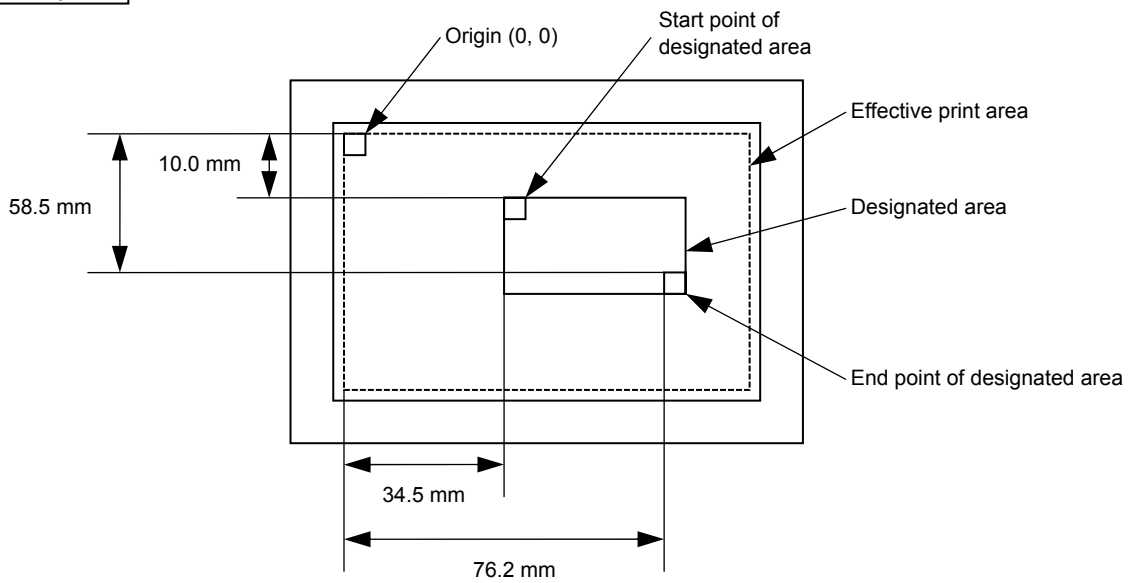
Explanation



Notes

- (1) The result is the same even if the start and end point coordinates are reversed.
- (2) The result is the same even if the start point is set to the upper right and the end point is set to the lower left, respectively.
- (3) The start and end point coordinates of the designated area must be set within the effective print area set by the Label Size Set Command ([ESC] D).
- (4) Only numerals are available in the coordinate input area.
- (5) When any type other than A and B is selected for how to clear, an error occurs.
- (6) If the print ratio of one line (the print head width) is higher than defined, printing may become poor, or the printer may reset. When "Reverses the white/black dot pattern in the designated area" is selected for how to clear and the black dot pattern is increased, be careful about the print ratio.

Examples



```
[ESC] XR; 0345, 0100, 0762, 0585, A [LF] [NUL]  
[ESC] XS; I, 0001, 0002C4000 [LF] [NUL]
```

5.6 COMMANDS RELATED TO DRAWING FORMAT

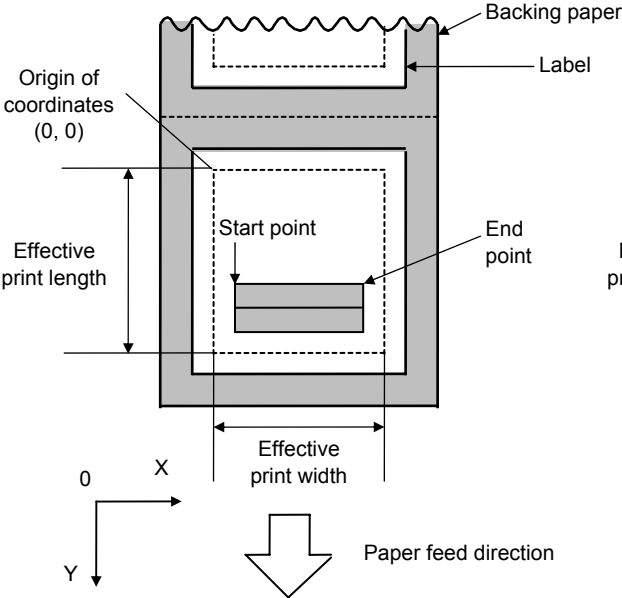
5.6.1 LINE FORMAT COMMAND

[ESC] LC

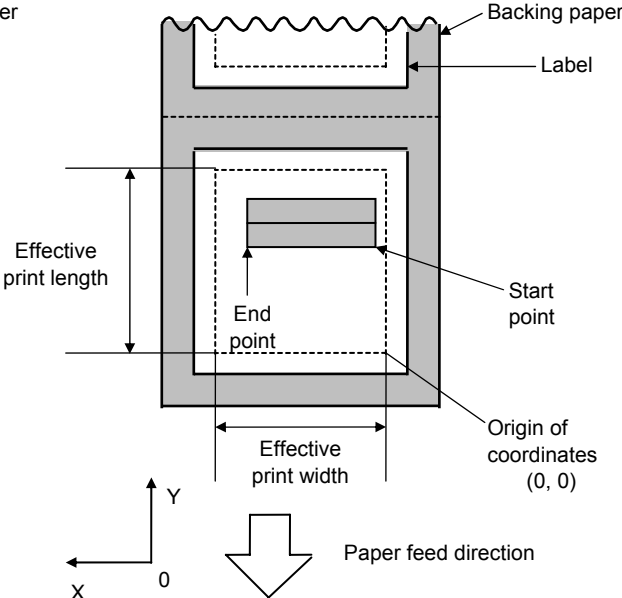
Function	Sets the line format and draws the line.
Format	[ESC] LC; aaaa, bbbb, cccc, dddd, e, f (, ggg) [LF] [NUL]
Term	<p>aaaa: X-coordinate of the start point Fixed at 4 digits (in 0.1 mm units)</p> <p>bbbb: Y-coordinate of the start point 4 or 5 digits (in 0.1 mm units)</p> <p>cccc: X-coordinate of the end point Fixed at 4 digits (in 0.1 mm units)</p> <p>dddd: Y-coordinate of the end point 4 or 5 digits (in 0.1 mm units)</p> <p>e: Type of line 0: Line (horizontal, vertical) 1: Rectangle 2: Line with dots skipped (horizontal line, vertical line) * Reserved in the case of the compatible mode for the B-SP series (If specified, it is processed as "0.") 3: Rectangle with dots skipped * Reserved in the case of the compatible mode for the B-SP series (If specified, it is processed as "1.") 4: Reserved (If specified, it is processed as "1.") 5: Reserved (If specified, it is processed as "0.") 6: Reserved (If specified, it is processed as "1.")</p> <p>f: No. of line width dots 1 to 9 or 01 to 99 (in 0.1 mm units)</p> <p>ggg: Radius of rounded corners of a rectangle (Omissible. If omitted, the chamfering process for rectangle corners is not performed.) Fixed at 3 digits (in 0.1 mm units) * Reserved in the case of the compatible mode for the B-SP series</p>

Explanation

- (1) When the set values for the X- and Y- coordinates of the start point and X- and Y- coordinates of the end point are not within the image (frame) buffer, the line is not drawn.
- (2) When the type of line is set to any value other than the range from 0 to 6, a command error occurs.
- (3) When the number of line width dots is set to "0," a command error occurs.
- (4) The reserved parameter (omissible) is not performed.
- (5) If the print ratio of one line (the print head width) is higher than defined, printing may become poor, or the printer may be reset. When a horizontal line is printed, be careful about the print ratio.



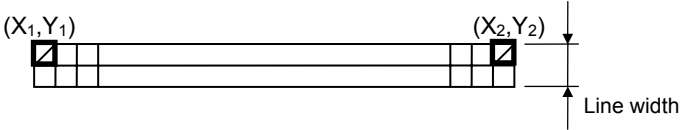
[Printing direction: Bottom first]



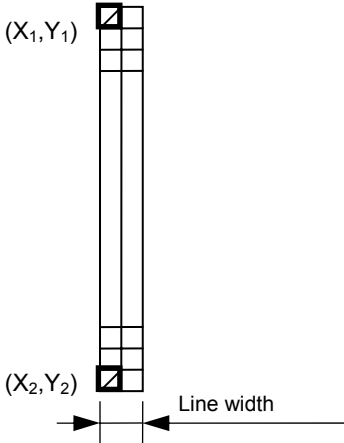
[Printing direction: Top first]

[Line]

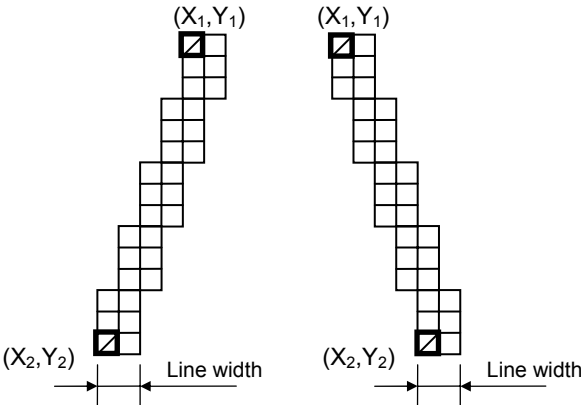
(1) Horizontal line (In the case of $|Y_2 - Y_1| = 0$)



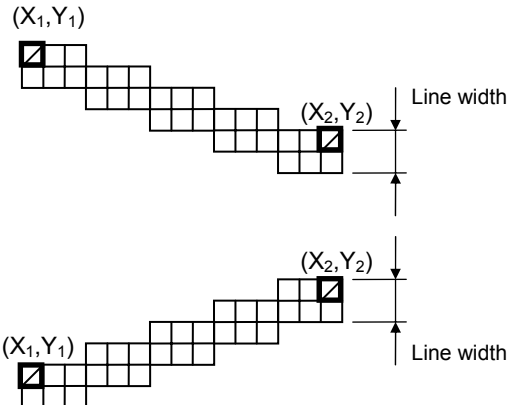
(2) Vertical line (In the case of $|X_2 - X_1| = 0$)



(3) Slant line A ($|X_2 - X_1| \leq |Y_2 - Y_1|$)

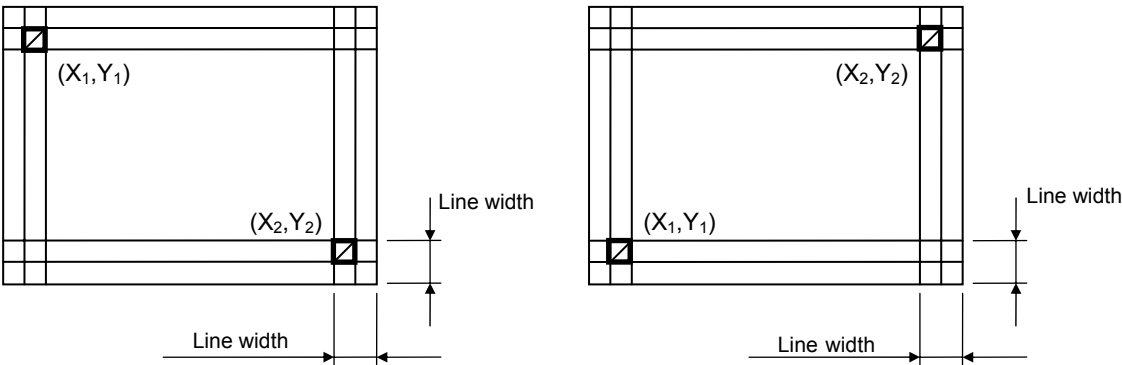


(4) Slant line B ($|X_2 - X_1| > |Y_2 - Y_1|$)

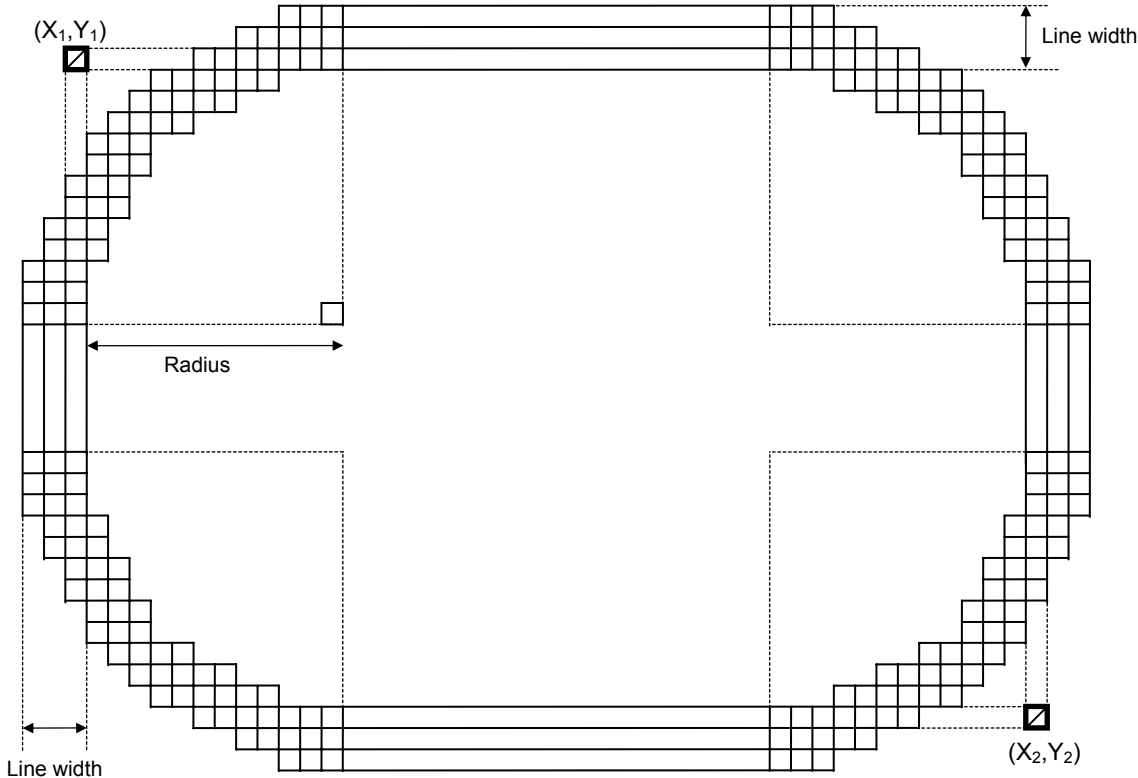


[Rectangle]

(1) Radius of rounded corners = 000, or parameter is omitted

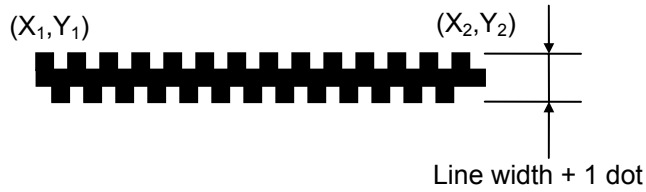


(2) Radius of rounded corners $\neq 000$



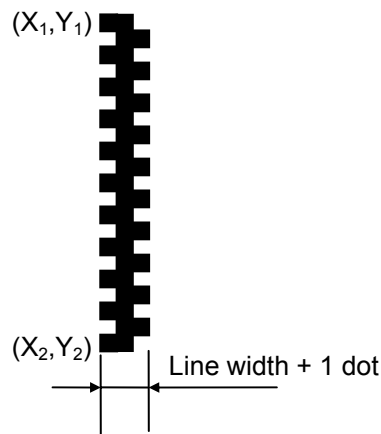
[Line with some dots skipped]

- (1) Horizontal line



Dots are skipped at the top and bottom areas only, which means that the thicker the line width is, the thicker the middle area of the line is.

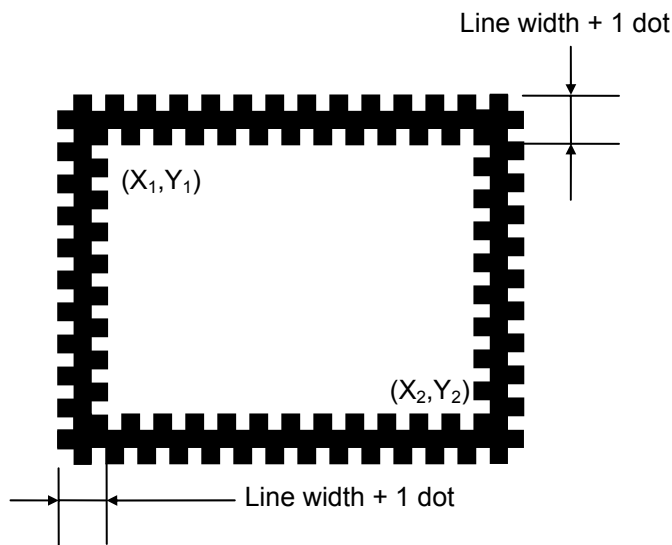
- (2) Vertical line



Dots are skipped at the leftmost and rightmost areas only, which means that the thicker the line width is, the thicker the middle area of the line is.

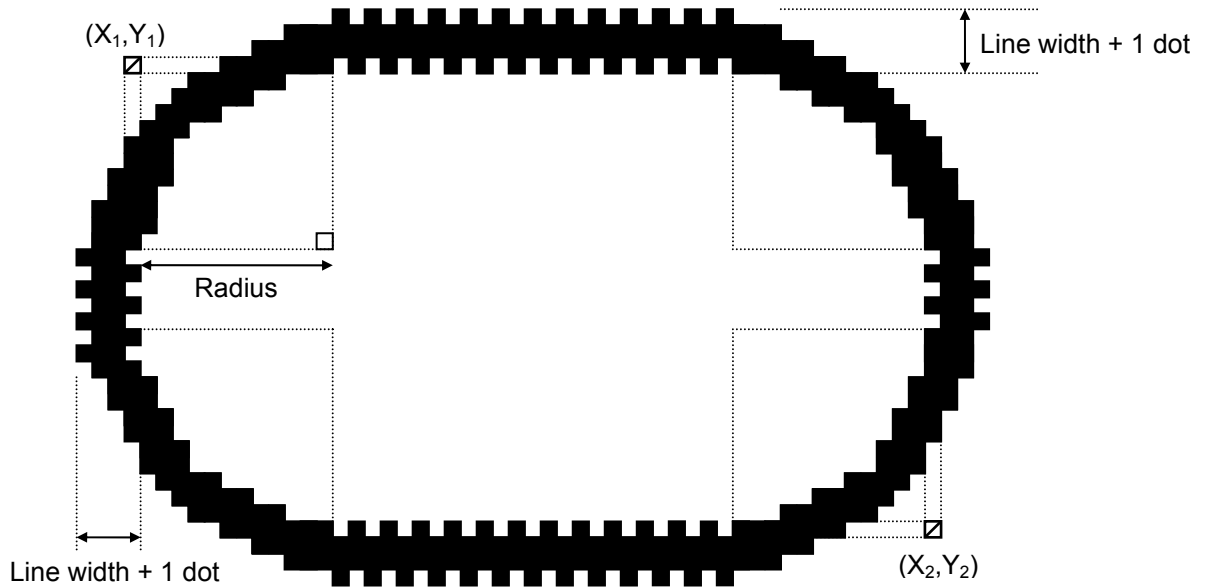
[Rectangle]

- (1) Radius of rounded corners = 000, or parameter is omitted



Dots are skipped at the top, bottom, leftmost and rightmost areas only, which means that the thicker the line width is, the thicker the middle area of the line is.

(2) Rounded corners of a rectangle ≠ 000



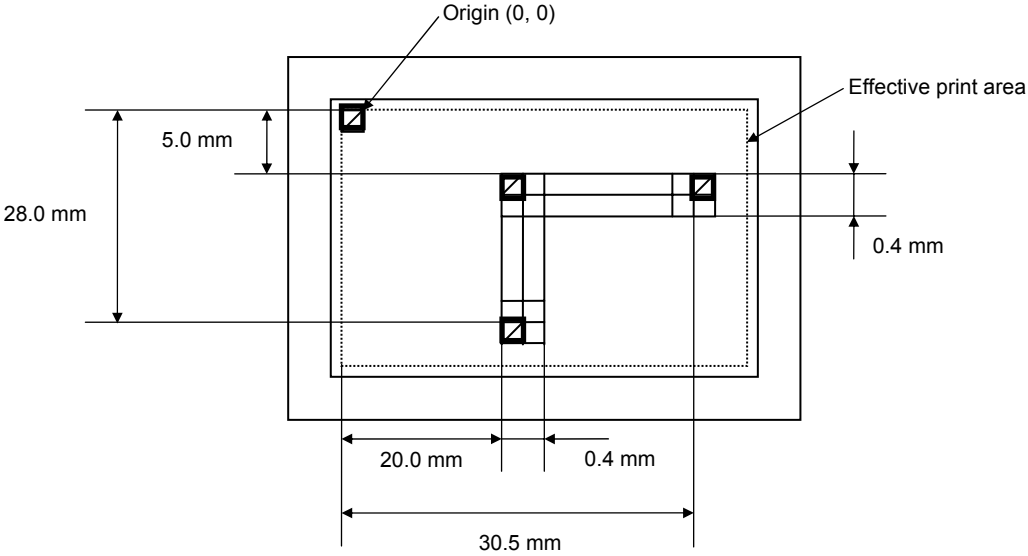
Notes

- (1) In line designation, a horizontal line, vertical line, or slant line A or B is drawn according to the start and end point coordinates. However, in the case of the compatible mode for the B-SP series, when the coordinates which make a slanted line are specified, a rectangle is drawn.
- (2) The result is the same even if the start and end point coordinates are reversed.
- (3) The start and end point coordinates must be set so that the result of line drawing will be within the effective print area set by the Label Size Set Command ([ESC] D).
- (4) Designation of the radius of the rounded corner is effective only when the type of line is set to 1 (rectangle) or 3 (rectangle with dots skipped). When the type of line is set to 0 or 2, designation of the radius is ignored.
- (5) When the type of line is set to 1 or 3 and the radius of the rounded corner is set to 000 or omitted, a normal rectangle is drawn.
- (6) On the following condition, a circle is supposed to be drawn:

$$\frac{|X_2 - X_1|}{2} = \frac{|Y_2 - Y_1|}{2} \leq [\text{Radius of rounded corners}]$$

- (7) Only numerals are available in the coordinate input area.

Example



```
[ESC] C [LF] [NUL]  
[ESC] LC; 0200, 0050, 0305, 0050, 0, 4 [LF] [NUL]  
[ESC] LC; 0200, 0050, 0200, 0280, 0, 4 [LF] [NUL]  
[ESC] XS; I, 0001, 0002C4000 [LF] [NUL]
```


M:	Presentation (Bold)	27 points
N:	Letter Gothic (Medium)	14.3 points
O:	Prestige Elite (Medium)	10.5 points
P:	Prestige Elite (Bold)	15 points
Q:	Courier (Medium)	15 points
R:	Courier (Bold)	18 points
S:	OCR-A	12 points
T:	OCR-B	12 points
U (a):	Kanji	(16 × 16 dots) Writable character 41
V (a):	Kanji	(24 × 24 dots) Writable character 42
W (a):	Reserved	
a:	Standard character	(12 × 24 dots)
b:	Bold character	(48 × 96 dots)
c:	Reserved)	
d:	Price Font 1	(16 × 40 dots)
e:	Price Font 2	(32 × 48 dots)
f:	Reserved	
g:	Reserved	
h:	Reserved	
i:	Reserved	
j:	Reserved	
k:	Reserved	
l:	Reserved	
m:	Reserved	
n:	Reserved	
o:	Gothic725 Black	6 points
p:	Reserved	
q:	Gothic725 Black	6 points
r:	Chinese	(24 × 24 dots) Writable character 42
s:	Korean	(24 × 24 dots) Writable character 42
t:	Reserved	
u:	Reserved	
v:	Reserved	
w:	Kanji (Ming type)	(32 × 32 dots) Writable character 43
01 (a):	Writable character 1 (1 × 1 dot to 720 × 720 dots)	
	⇕	
40 (a):	Writable character 40 (1 × 1 dot to 720 × 720 dots)	
51 (a):	2-byte code set writable character (1 × 1 dot to 720 × 720 dots)	
52 (a):	Reserved	
	⇕	
55 (a):	Reserved	
	a: Reserved area 0 to 2 (Omissible)	
	* The following fonts are proportional.	
	A, B, C, D, E, F, G, H, I, J, K, L, o, q	
ghh:	Fine adjustment of character-to-character space (Omissible. If omitted, space is adjusted according to the designated font.)	
	g: Designates whether to increase or decrease the character-to-character space.	
	+: Increase	
	-: Decrease	
hh:	No. of space dots between characters	

00 to 99 (in units of dots)

ii: Rotational angles of a character and character string

- 00: 0° (char.) 0° (char.-string)
- 11: 90° (char.) 90° (char.-string)
- 22: 180° (char.) 180° (char.-string)
- 33: 270° (char.) 270° (char.-string)
- 01: 0° (char.) 90° (char.-string)
- 12: 90° (char.) 180° (char.-string)
- 23: 180° (char.) 270° (char.-string)
- 30: 270° (char.) 0° (char.-string)

} Font types: U, V, r and w only

j: Character attribution

B: Black character

W (aabb): Reverse character

aa: No. of dots from the character string to the end of the black background in the horizontal direction

bb: No. of dots from the character string to the end of the black background in the vertical direction

aa: 01 to 99 (in units of dots)

bb: 01 to 99 (in units of dots)

F (aabb): Boxed character

aa: No. of dots from the character string to the box in the horizontal direction

bb: No. of dots from the character string to the box in the vertical direction

aa: 01 to 99 (in units of dots)

bb: 01 to 99 (in units of dots)

* Reserved in the case of the compatible mode for the B-SP series
(If specified, it is processed as "B.")

C (aa): Strike-through character

aa: No. of dots from the character string to the end of a strike-through in the horizontal direction

aa: 01 to 99 (in units of dots)

* Reserved in the case of the compatible mode for the B-SP series
(If specified, it is processed as "B.")

* Descriptions in parentheses are omissible.

(If omitted, it is character magnification (horizontal or vertical magnifications, whichever is larger) × 6 dots.)

Jkkll: Bold character designation

(Omissible. If omitted, this process is not performed.)

kk: No. of horizontal shift dots

00 to 16 (in units of dots)

ll: No. of vertical shift dots

00 to 16 (in units of dots)

* Reserved in the case of the compatible mode for the B-SP series

- Mm: Type of check digits to be attached
(Omissible. If omitted, no check digit is drawn.)
m: Type of check digit
0: Modulus 10 (draws data and check digit.)
1: Modulus 43 (draws data and check digit.)
2: DBP Modulus 10 (Draws check digit only.)

* Reserved in the case of the compatible mode for the B-SP series
- noooooooooo: Increment and decrement
(Omissible. If omitted, increment/decrement is not performed.)
n: Designates whether to increment or decrement.
+: Increment
-: Decrement
- oooooooooooo: Skip value
0000000000 to 9999999999
- Zpp: Zero suppress (Omissible. If omitted, zero suppression is not performed.)
pp: No. of digits after zero suppression
00 to 20

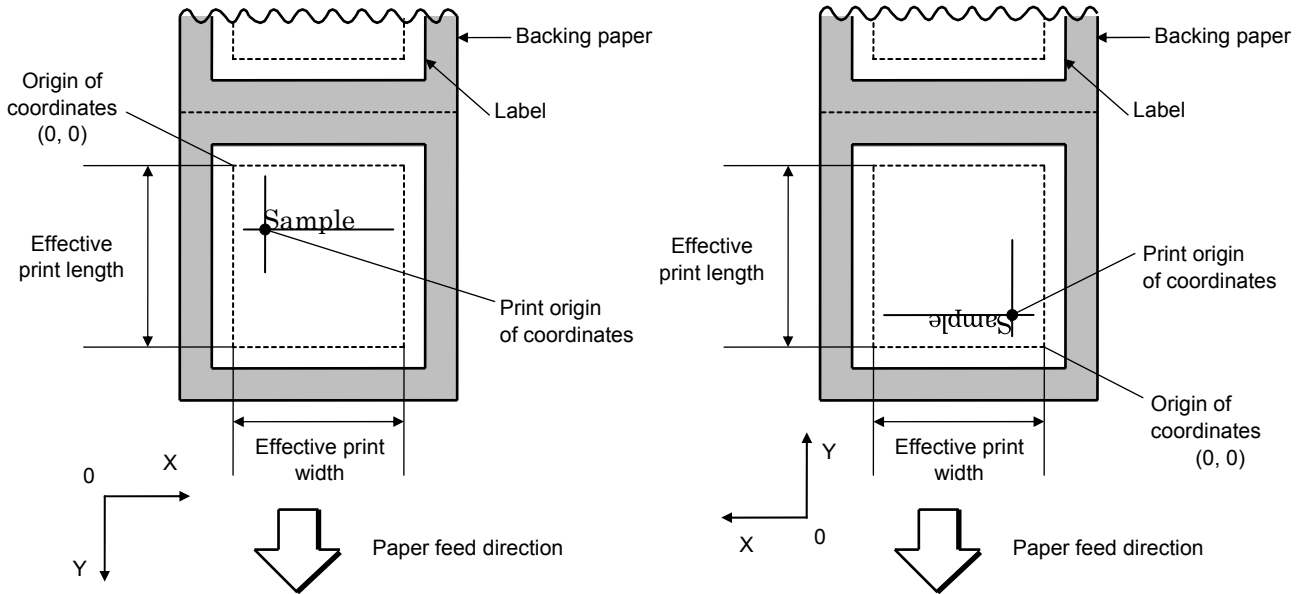
* Reserved in the case of the compatible mode for the B-SP series
- Pq: Alignment (Omissible. If omitted, the alignment is set to the left.)
q: Designates the character position
1: Left
2: Center
3: Right
4aaa: Justification
aaa: Character string in the X direction
0050 to 1040 (in 0.1 mm units)
5aaaabbcc: Automatic line feed
aaa: Character string in the X direction
0050 to 1040 (in 0.1 mm units)
bbb: Line feed spacing
010 to 500 (in 0.1 mm units)
cc: No. of lines
01 to 99
- rrr ----- rrr: Data string to be printed (Omissible)
Max. 255 digits
- ss₁, ss₂, ss₃ ----- , ss₂₀: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

Explanation

- (1) Character string number

When drawing by the Data Command ([ESC] RC), the format designated by the character string number is selected.

- (2) Print origin of coordinates

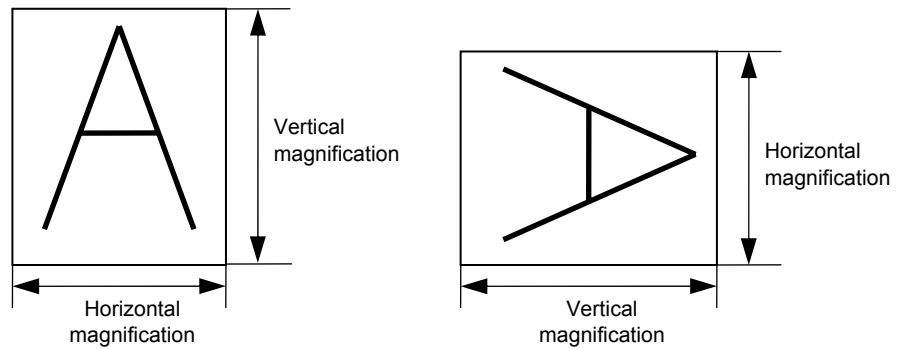


[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the character drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

- (3) Horizontal magnification and vertical magnification



Chinese CG is required to print the character type: r.

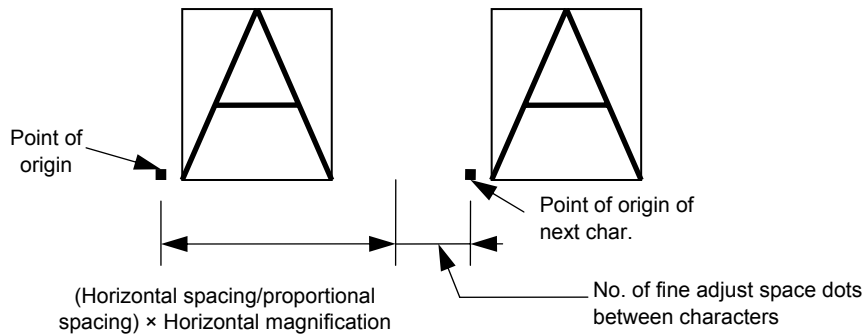
Korean CG is required to print the character type: s.

When any character type of 52 to 55 is specified, it is invalid. However, an error does not occur, instead a blank is printed.

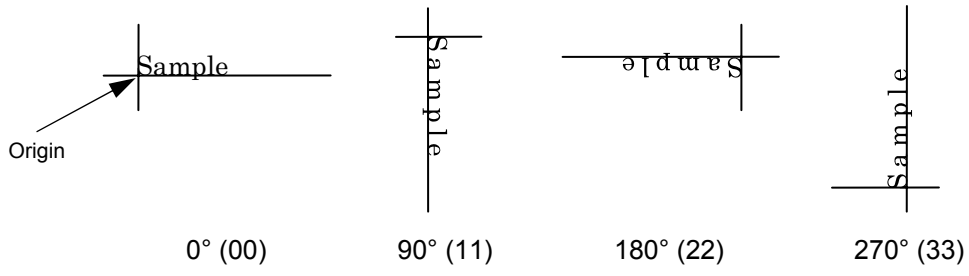
If any character type out of the range is specified, a command error occurs.

(5) Fine adjustment of character-to-character space

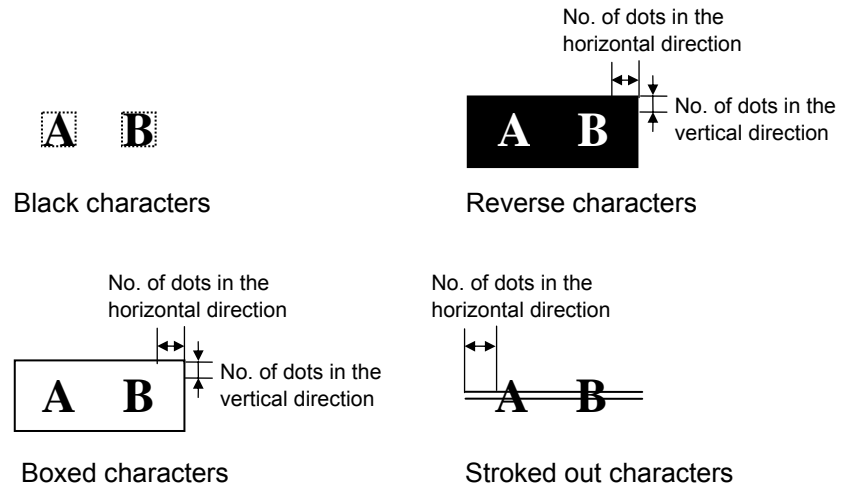
If no character-to-character space is specified or the number of space dots between characters is 0, drawing will take place according to the horizontal spacing/proportional spacing determined for each character. If character-to-character space is specified, drawing will take place according to the value obtained by adding the character spacing/proportional spacing to the specified value.



(6) Rotational angles of a character and character string

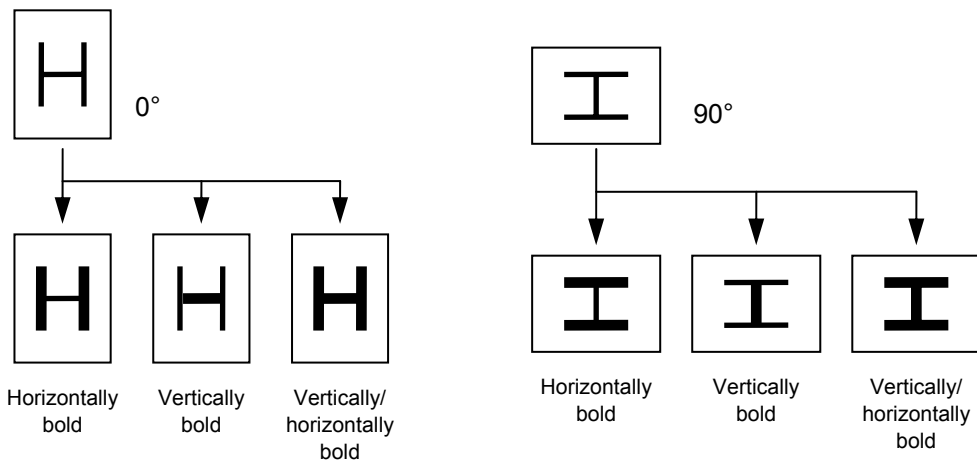


(7) Selection of character attribution



If the print ratio of one line (the print head width) is higher than defined, printing may become poor, or the printer may be reset. When "Reverse character" is selected for how to clear and the black dot pattern is increased, be careful about the print ratio.

(8) Bold character designation



(9) Check digit to be attached

When Modulus 10 or Modulus 43 is selected, the check digit of a data row is calculated and attached to the data row for drawing. In case of Modulus 10, when the data includes any data other than numerals, drawing is not performed. In case of Modulus 43, when the data includes any data other than CODE39, drawing is not performed, either.

When DBP Modulus 10 is selected, the check digit of a data row is calculated and only the check digit is drawn. When the data includes any data other than numerals, drawing is not performed.

When the font type is U, V, r, s or w, the check digit cannot be designated.

(Even if it is designated, it is ignored.)

* DBP Modulus 10 is Modulus 10 for Deutsche Bundespost Postdienst only.

(10) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

When the font type is U, V, r, s, w, a (for JA type only), 41, 42, 43 or 51, increment/decrement cannot be designated.

(Even if it is designated, it is ignored.)

Initial value	0000	0000	0000	0000	999999
INC/DEC	+10	+10	+10	+10	+1
Zero suppression	Not designated	5	3	0	3
1st label	0000	0000	└000	0000	999999
2nd label	0010	0010	└010	0010	└└└000
3rd label	0020	0020	└020	0020	└└└001
4th label	0030	0030	└030	0030	└└└002
5th label	0040	0040	└040	0040	└└└003

Letters and numerals for increment/decrement

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(11) Zero suppression

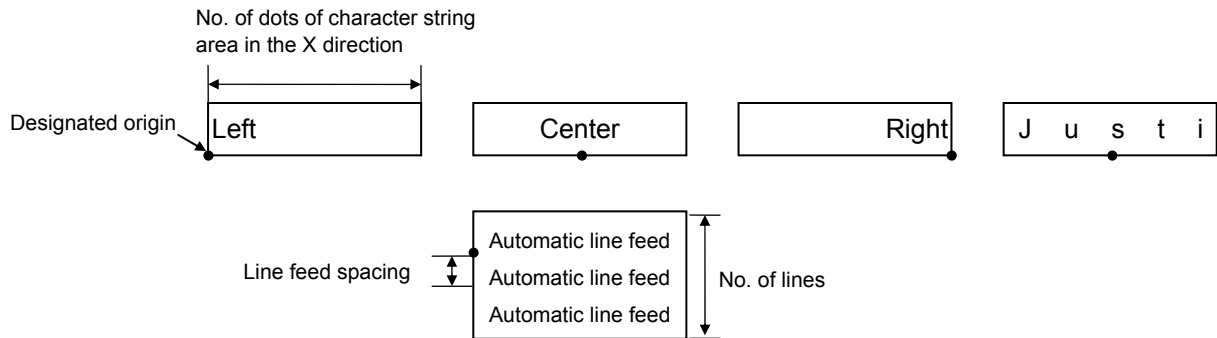
No. of digits after zero suppression	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	└└└0	└└00	└A12	└123	0123	0123

Zero(s) in a data row is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data row, the data row will be drawn without performing zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

When the font type is U, V, r, s, w, a (for JA type only), 41, 42, 43 or 51, zero suppression is not designated.

(Even if it is designated, it is ignored.)

(12) Alignment



If characters are not placed on one line when justification and automatic line feed are designated, the following steps are performed.

Decrease the value of the character-to-character space. When characters are not placed on one line even if the value is set to 0, return the value to its default, and then reduce the horizontal magnification for a character by 0.5. If characters are still not placed on one line, repeatedly decrease the value of the character-to-character space, and then reduce the horizontal magnification. When characters are not placed on one line if the character magnification is set to 0.5 and the character-to-character space is set to 0, the field is not drawn.

When Rotational angles of a character and character string is set to 01, 12, 23 or 30, the designation of center, right, justification and automatic line feed is ignored.

(13) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=.” Up to 255 digits of characters can be printed. However, when the font type is U, V, r, s, w or 51, the maximum number of characters is 127. When it is r as a 4-byte code, the maximum number of characters is 64.

When the number of characters exceeds the maximum number of digits, the excess data will be discarded.

For the character code table, refer to the character code table mentioned later.

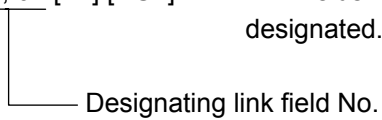
(14) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”
After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.
Up to 20 fields can be linked.
If the link field exceeds 20 fields, an error occurs.
The following shows an example of linked fields on the two continuous labels.

[Format Command]

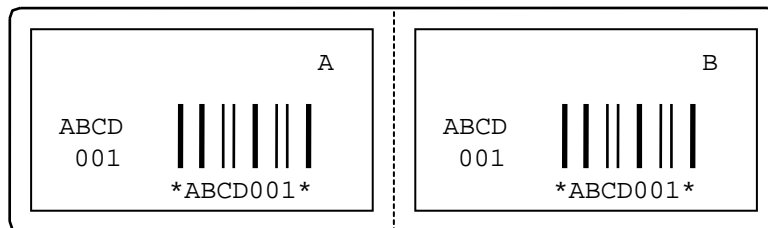
[ESC] PC01; ; 01 [LF] [NUL] : Link field No. 1 is designated.
[ESC] PC02; ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC03; ; 04 [LF] [NUL] : Link field No. 4 is designated.
[ESC] XB01; ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[ESC] PC04; ; 02 [LF] [NUL] : Link field No. 2 is designated.
[ESC] PC05; ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC06; ; 04 [LF] [NUL] : Link field No. 4 is designated.
[ESC] XB02; ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.



[Data Command]

[ESC] RC; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]



Notes

- (1) The check digit attachment, increment/decrement and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

For example, the zero(s) is replaced with a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.
Increment/decrement > zero suppression > attachment of check digit

- (2) Up to 32 fields for which increment/decrement has been designated can be drawn. If the total of bit map font, outline font and barcode increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Example]

- 1) Format Command (Incrementing character string No. 001 (+1))
- 2) Format Command (No incrementing character string No. 002)
- 3) Format Command (Incrementing character string No. 003 (+2))
- 4) Image Buffer Clear Command
- 5) Data Command (Character string No. 001 "0001")
- 6) Data Command (Character string No. 002 "AB-")
- 7) Data Command (Character string No. 003 "0100")
- 8) Issue Command (2 labels)

0001
AB-0100

0002
AB-0102

- 9) Issue Command (1 label)

0003
AB-0104

- 10) Image Buffer Clear Command

- 11) Data Command (Character string No. 02 "00000")

- 12) Issue Command (1 label)

00000

- (3) The Bit Map Font Format Command may be connected to the Outline Font Format Command when transmitted.

```
[ESC] P C001; 0100, 0150, 1, 1, A, 00, B [LF]
        C002; 0350, 0180, 1, 1, A, 00, B [LF]
        C005; 0200, 0300, 25, 2, C, +05, 00, B, +0000000001 [LF]
        V01; 0500, 0400, 0100, 0100, A, 00, B [LF] [NUL]
```

- (4) When the drawing data differs for every label, the field of the drawing data for the previous label is automatically cleared using the character string number, then the next drawing data is printed. Therefore, the character string number should be designated so that they differ according to the drawing fields.

Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same character string number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same character string number are automatically cleared until the Clear Command is sent.)

- (5) The link field designation is cleared by omitting the link field designation using the same character string No. and reformatting data.

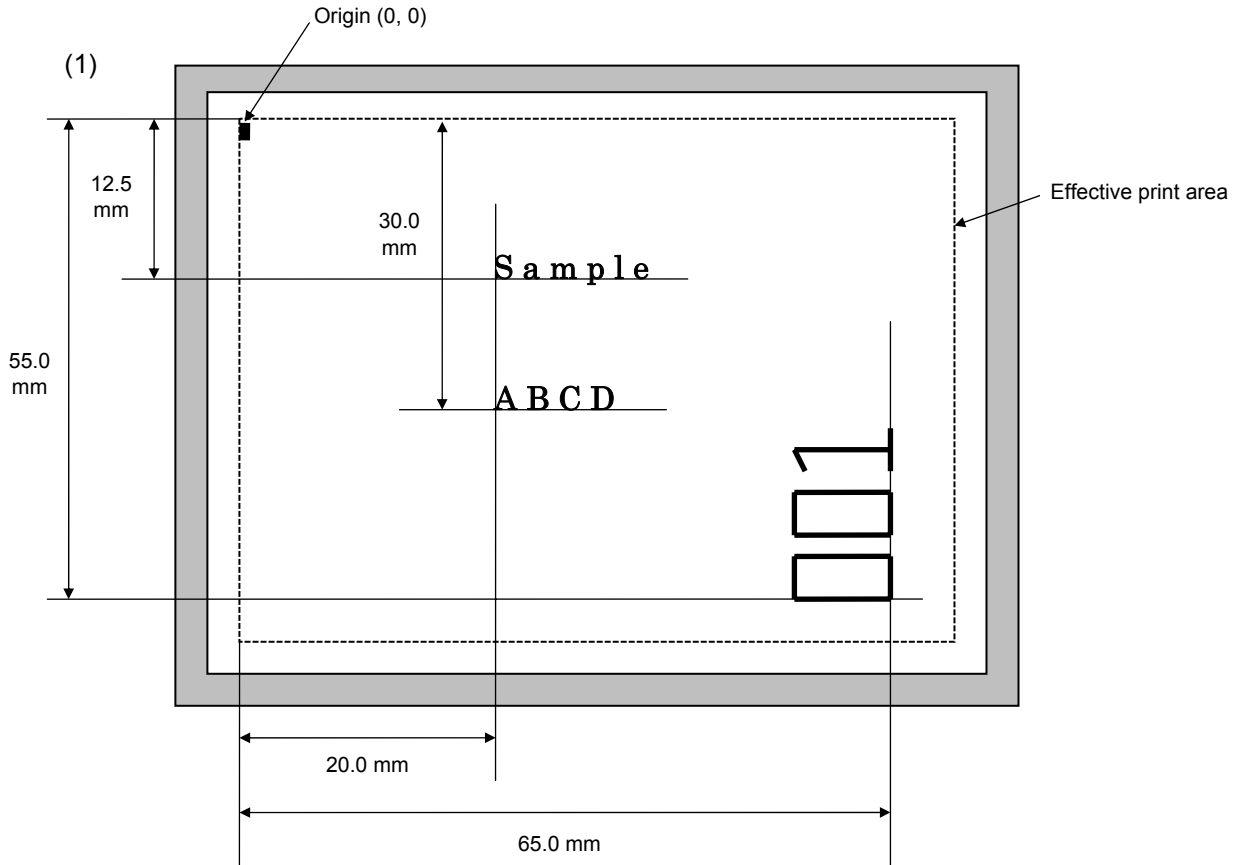
The link field designation can be also cleared by the Image Buffer Clear Command.

- (6) A print data string and link field No. cannot be programmed at the same time.
- (7) When the (reserved) area for the font type is designated, the bit map font format is not specified.
- (8) In the case of the compatible mode for the B-SP series, the reserved area is not checked.
- (9) For character sets from 41 to 43, a character code consisting of 1 byte is stored. However, when the character code is read, F0H is added to the upper digit or FFH is added to the upper digit with Chinese characters installed, and consists of 2 bytes. In this case, up to 188 characters can be stored per character set.

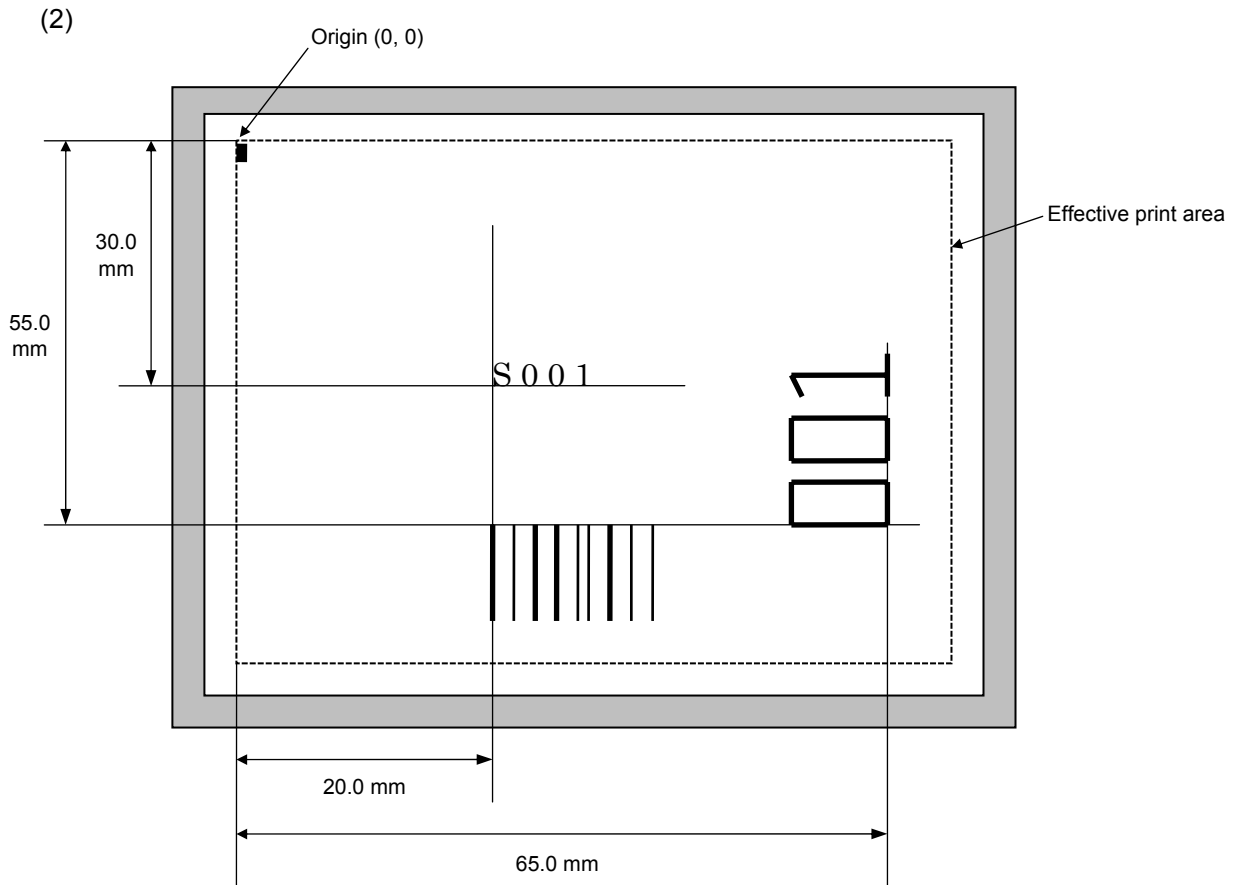
Refer to

- Bit Map Font Data Command ([ESC] RC)
- Outline Font Format Command ([ESC] PV)
- Barcode Format Command ([ESC] XB)

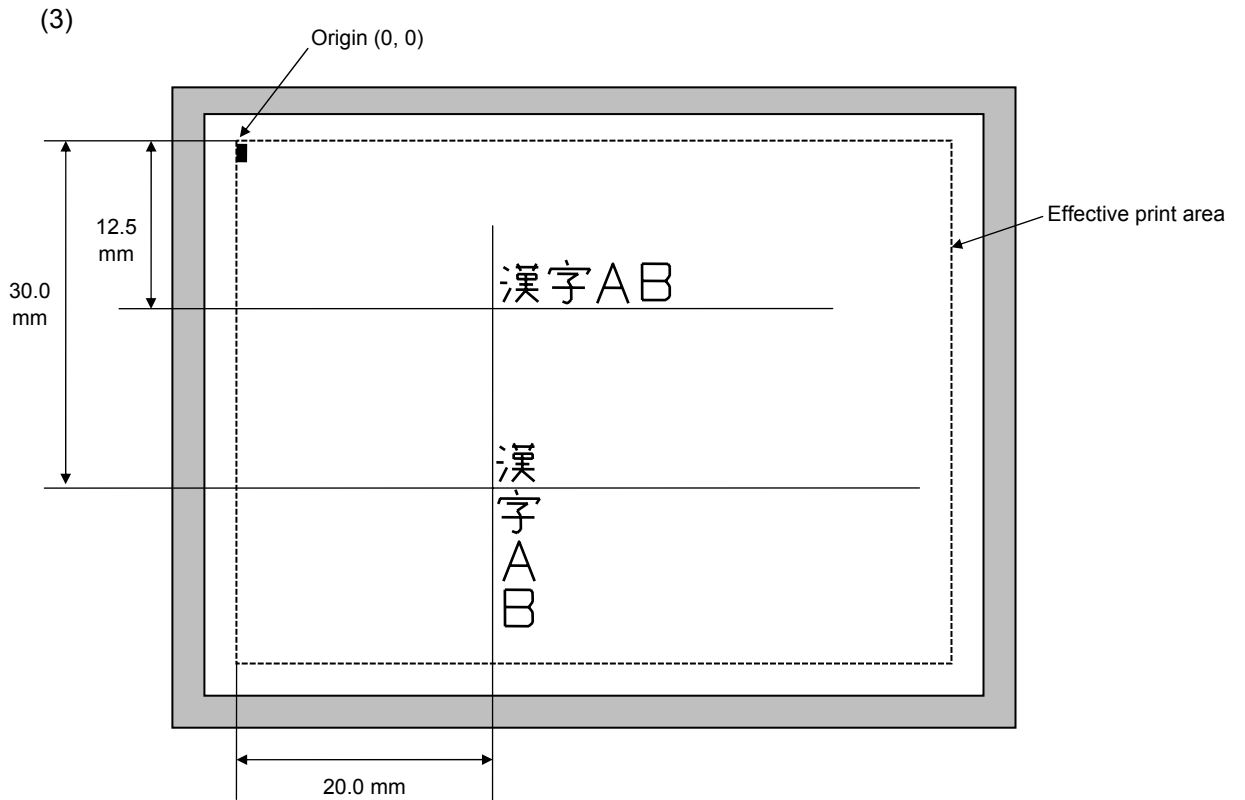
Examples



```
[ESC] C [LF] [NUL]
[ESC] PC000; 0200, 0300, 1, 1, A, 00, B=ABCD [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, C, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RC; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



```
[ESC] C [LF] [NUL]  
[ESC] PC000; 0200, 0125, 1, 1, W, 00, B [LF] [NUL]  
[ESC] PC001; 0200, 0300, 1, 1, W, 01, B [LF] [NUL]  
[ESC] RC000; 漢字 AB [LF] [NUL]  
[ESC] RC001; 漢字 AB [LF] [NUL]  
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

5.6.3 OUTLINE FONT FORMAT COMMAND

[ESC] PV

Function	Sets the format to indicate where and how the outline font is to be printed.
Format	<p>① [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (, lpp) (, Qoooo, Rpp) (= qqg ----- qqg) [LF] [NUL]</p> <p>② [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (, lpp) (, Qoooo, Rpp) (; rr₁, rr₂, rr₃, ----- , rr₂₀) [LF] [NUL]</p>
Term	<p>aa: Character string number 00 to 99</p> <p>bbbb: X-coordinate of the print origin of character string Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of character string 4 or 5 digits (in 0.1 mm units)</p> <p>dddd: Width of the character 0020 to 0850 (in 0.1 mm units)</p> <p>eeee: Height of the character 0020 to 0850 (in 0.1 mm units)</p> <p>f: Type of font A: TEC FONT1 (Helvetica [bold]) B: TEC FONT1 (Helvetica [bold], proportional) E: Print front 1 F: Price font 2 G: Price font 3 K: Reserved C, D, H, I, J: Reserved (If specified, it is processed as "B.")</p> <p>ghhh: Fine adjustment of character-to-character space (Omissible. If omitted, space is adjusted according to the designated font.) g: Designates whether to increase or decrease the character-to-character space. +: Increase -: Decrease</p> <p>hhh: No. of space dots between characters 000 to 512 (in units of dots)</p> <p>ii: Rotational angles of a character and character string 00: 0° (char.) 0° (char.-string) 11: 90° (char.) 90° (char.-string) 22: 180° (char.) 180° (char.-string) 33: 270° (char.) 270° (char.-string)</p>

- j: Character attribution
- B: Black character
 - W (aabb): Reverse character
 - aa: No. of dots from the character string to the end of the black background in the horizontal direction
 - bb: No. of dots from the character string to the end of the black background in the vertical direction
 - aa: 01 to 99 (in units of dots)
 - bb: 01 to 99 (in units of dots)
 - F (aabb): Boxed character
 - aa: No. of dots from the character string to the box in the horizontal direction
 - bb: No. of dots from the character string to the box in the vertical direction
 - aa: 01 to 99 (in units of dots)
 - bb: 01 to 99 (in units of dots)
 - * Reserved in the case of the compatible mode for the B-SP series (If specified, it is processed as "B.")
 - C (aa): Strike-through character
 - aa: No. of dots from the character string to the end of a strike-through in the horizontal direction
 - aa: 01 to 99 (in units of dots)
 - * Reserved in the case of the compatible mode for the B-SP series (If specified, it is processed as "B.")
 - * Parenthesized descriptions are omissible. (If omitted, it is character size (the character width or height, whichever is greater) ÷ 8 dots.)
- Mk: Type of the check digit to be attached
(Omissible. If omitted, no check digit is drawn.)
- k: Type of check digit
 - 0: Modulus 10 (Draws data and check digit.)
 - 1: Modulus 43 (Draws data and check digit.)
 - 2: DBP Modulus 10 (Draws check digit only.)
 - * Reserved in the case of the compatible mode for the B-SP series
- lmmmmmmmm: Increment and decrement
(Omissible. If omitted, increment/decrement is not performed.)
- l: Designates whether to increment or decrement.
- +: Increment
 - : Decrement
- mmmmmmmmmm: Skip value
0000000000 to 9999999999
- Znn: Zero suppress (Omissible. If omitted, zero suppression is not performed.)
- pp: No. of digits after zero suppression
 - 00 to 20
 - * Reserved in the case of the compatible mode for the B-SP series

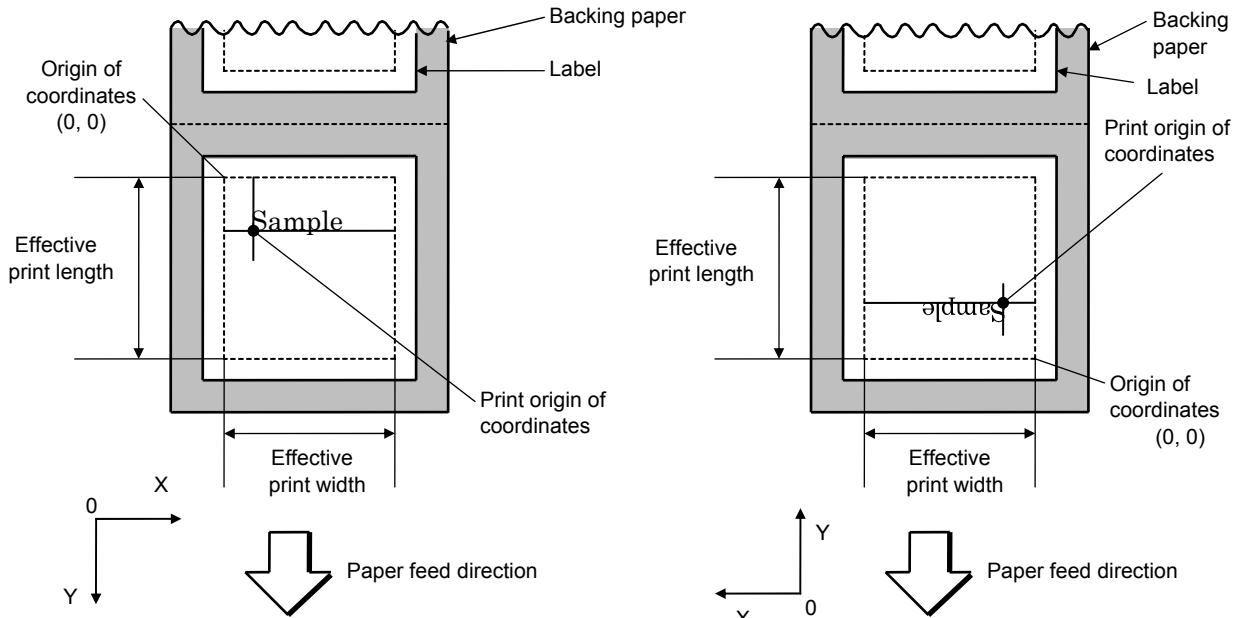
- Po: Alignment (Omissible. If omitted, the alignment is set to the left.)
o: Designates the character position.
1: Left
2: Center
3: Right
4aaaa: Justification
aaa: Character string in the X direction
0050 to 1040 (in 0.1 mm units)
* 4 is reserved in the case of the compatible mode for the B-SP series.
(If specified, it is processed as "1.")
- lpp: Italic (Omissible. If omitted, the italic is not applied. Only TEC FONT1 is supported)
pp: Angle of the italic
00 to 45 (in units of degrees)
- Qoooo: Character string width (Omissible. If omitted, it is 0000.)
0000 to 1600 (in 0.1 mm units)
- Rpp: No. of character string digits
(Omissible. If omitted, it is 00.)
00 to 99
- qqq ----- qq: Data string to be printed (Omissible)
Max. 255 digits
- rr₁, rr₂, rr₃ ----- , rr₂₀: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

Explanation

- (1) Character string number

When drawing by the Data Command ([ESC] RV), the format designated by the character string number is selected.

- (2) Print origin of coordinates

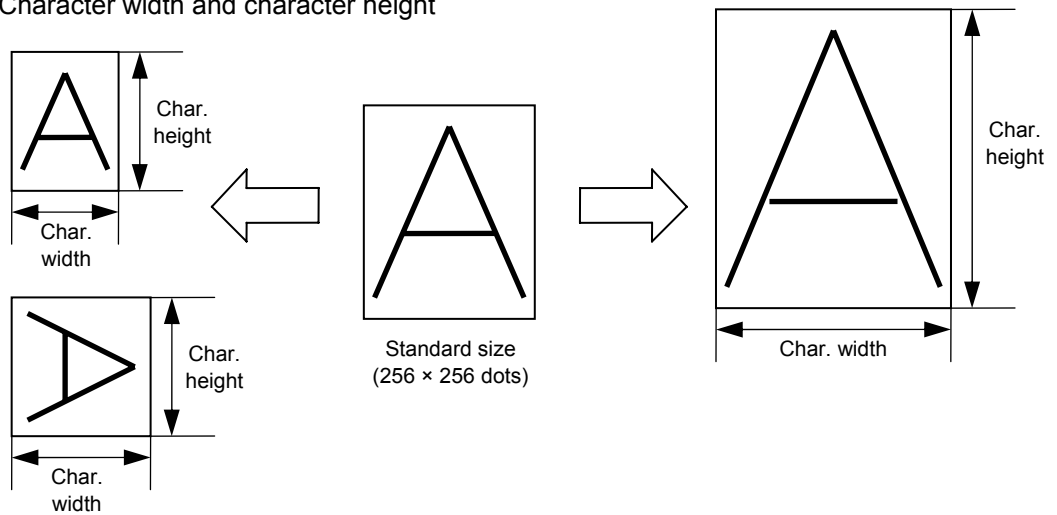


[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the character drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

- (3) Character width and character height



(4) Type of font

A: TEC FONT1 (Helvetica [bold])

! " # \$ % & ' () * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ?
@ A B C D E F G H I J K L M N O
' a b c d e f g h i j k l m n o
Ç ü é â ä à å ç ê ë è ì î ï Ì Ä Å

B: TEC FONT1 (Helvetica [bold], proportional)

! " # \$ % & ' () * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ?
@ A B C D E F G H I J K L M N O
' a b c d e f g h i j k l m n o
Ç ü é â ä à å ç ê ë è ì î ï Ì Ä Å

E: Price Font 1 (POP Font)

\$ % , - . /
0 1 2 3 4 5 6 7 8 9
円 ¥ ~

F: Price Font 2 (POP Font)

\$ % , - . /
0 1 2 3 4 5 6 7 8 9
円 ¥ ~

G: Price Font 3 (POP Font)

\$%,-. /

0123456789

円 ¥ ~

(5) Fine adjustment of character-to-character space

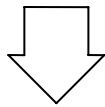
If no character-to-character space is specified or the number of space dots between characters is 0, drawing will take place according to the horizontal spacing/proportional spacing determined for each character.

If character-to-character space is specified, drawing will take place according to the value obtained by adding the character spacing/proportional spacing to the specified value.

When justify is selected for the alignment, the character-to-character space setting is invalid.

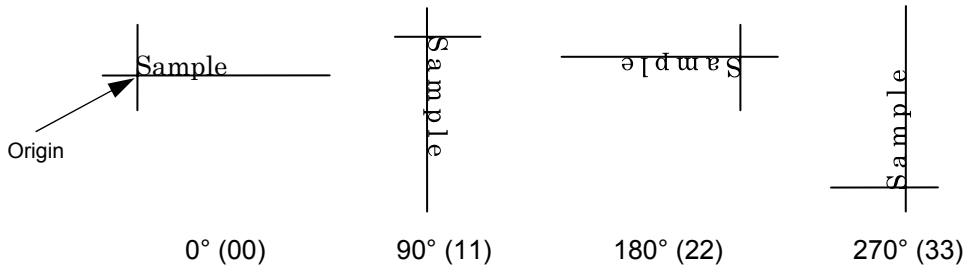
(The horizontal spacing/proportional spacing is increased or decreased depending on the character size.)

A B C

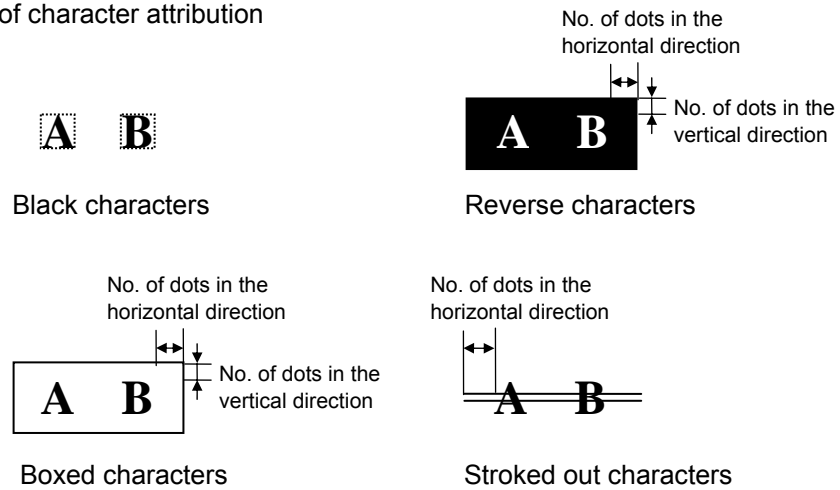


A B C

(6) Rotational angles of a character and character string



(7) Selection of character attribution



If the print ratio of one line (the print head width) is higher than defined, printing may become poor, or the printer may be reset. When Reverse character is selected for how to clear and the black dot pattern is increased, be careful about the print ratio.

(8) Check digit to be attached

When Modulus 10 or Modulus 43 is selected, the check digit of a data row is calculated and attached to the data row for drawing. In case of Modulus 10, when the data includes any data other than numerals, drawing is not performed. In case of Modulus 43, when the data includes any data other than CODE39, drawing is not performed, either.

When DBP Modulus 10 is selected, the check digit of a data row is calculated and only the check digit is drawn. When the data includes any data other than numerals, drawing is not performed.

* DBP Modulus 10 is Modulus 10 for Deutsche Bundespost Postdienst only.

(9) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

Initial value	0000	0000	0000	0000	999999
INC/DEC	+10	+10	+10	+10	+1
Zero suppression	Not designated	5	3	0	3
1st label	0000	0000	└000	0000	999999
2nd label	0010	0010	└010	0010	└└└000
3rd label	0020	0020	└020	0020	└└└001
4th label	0030	0030	└030	0030	└└└002
5th label	0040	0040	└040	0040	└└└003

Letters and numerals for increment/decrement

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

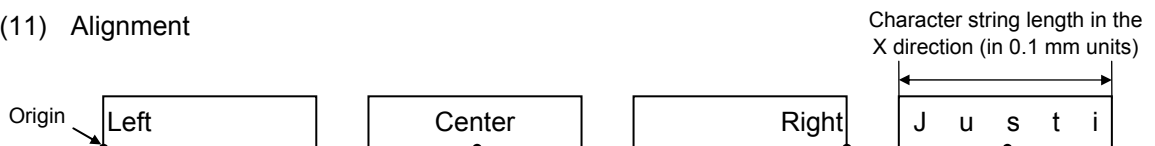
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(10) Zero suppression

No. of digits after zero suppression	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	└└└0	└└00	└A12	└123	0123	0123

Zero(s) in a data row is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data row, the data row will be drawn without performing zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

(11) Alignment



If characters are not placed on one line when justification is designated, the width is calculated automatically. When the width is less than the limit value (2 mm) for the outline font, that field will not be drawn. (The same previous field will not be drawn.)

(12) *Italic designation*

This designation allows italic printing. However, it is available only when TEC FONT1 is selected for the type of font.

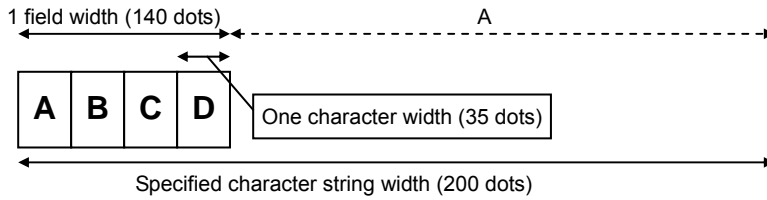
(13) Character string width and number of character string digits

Usually, one character size is determined by the character width and height. When the character string width and number of character string digits are specified, the character width will be automatically changed when printed. If the following conditions are satisfied, however, these parameter settings become ineffective, and the characters are printed in normal size.

- Conditions of ineffectiveness
 - (1) These parameters are omitted.
 - (2) The character string width is set to "0".
 - (3) No. of print data \geq No. of specified character string digits
- Conditions that these parameters become effective are described on the following pages.

- ① When one field width < specified character string width
(Space between characters = 0, Specified character string digits = 6)

- Print image when the parameter setting is omitted.

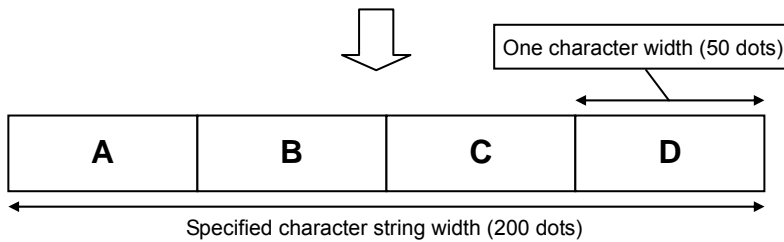


$$A = \text{Specified character string width} - 1 \text{ field width} = 200 \text{ dots} - 140 \text{ dots} = 60 \text{ dots}$$

$$B = A / \text{Data length} = 60 \text{ dots} / 4 = 15 \text{ dots}$$

$$\text{One character width} = 1 \text{ character width} + B = 35 \text{ dots} + 15 \text{ dots} = 50 \text{ dots}$$

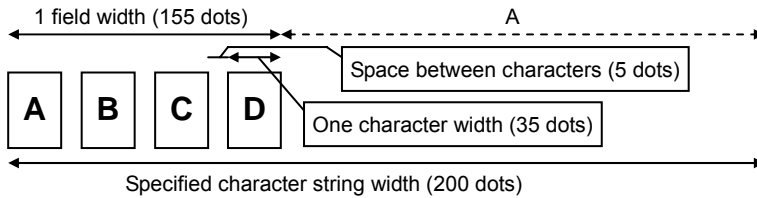
- Print image when the parameter setting is specified.



- * When the number of print data is 6 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ② When one field width < specified character string width
(Space between characters ≥ 0 , Specified character string digits = 5)

- Print image when the parameter setting is omitted.

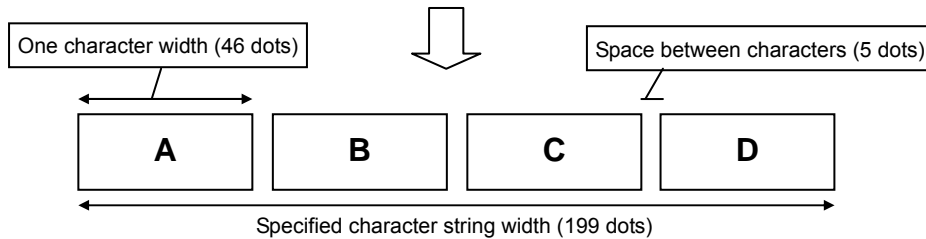


$$A = \text{Specified character string width} - 1 \text{ field width} = 200 \text{ dots} - 155 \text{ dots} = 45 \text{ dots}$$

$$B = A / \text{Data length} = 45 \text{ dots} / 4 \approx 11 \text{ dots}$$

$$\text{One character width} = 1 \text{ character width} + B = 35 \text{ dots} + 11 \text{ dots} = 46 \text{ dots}$$

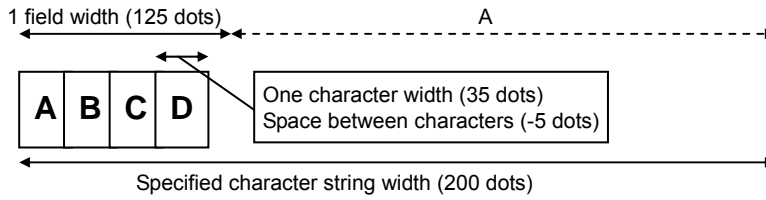
- Print image when the parameter setting is specified.



- * When the number of print data is 5 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ③ When one field width < specified character string width
(Space between characters < 0, Specified character string digits = 8)

- Print image when the parameter setting is omitted.



Corrected space between characters = ((Specified character string digits – data length)
(x 0.5 + 1) x Space between characters = -15 dots

A = Specified character string width – (1 character width x Data length
+ (corrected space between characters x (Data length – 1))
= 200 dots – 95 dots = 105 dots

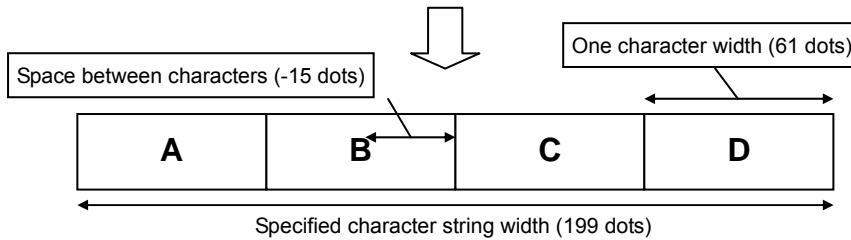
B = A/Data length = 105 dots/4 ≈ 26 dots (rounded down)

One character width = 1 character width + B = 35 dots + 26 dots = 61 dots

* The minimum. corrected space between characters is - 99 dots.

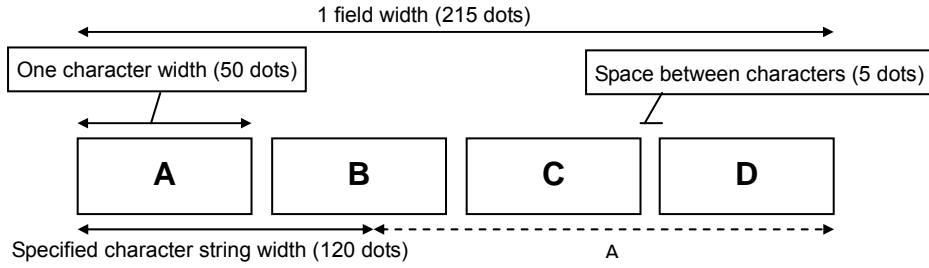
* The calculated one character width is doubled when doubled or more from the original one character width.

- Print image when the parameter setting is specified.



- * When the number of print data is 8 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ④ When one field width \geq specified character string width
(Space between characters ≥ 0 , Specified character string digits = 6)
 - Print image when the parameter setting is omitted.

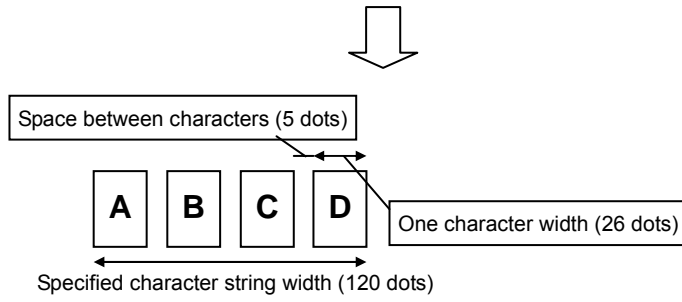


$$A = 1 \text{ field width} - \text{Specified character string width} = 215 \text{ dots} - 120 \text{ dots} = 95 \text{ dots}$$

$$B = A / \text{Data length} = 95 \text{ dots} / 4 \approx 24 \text{ dots (rounded up)}$$

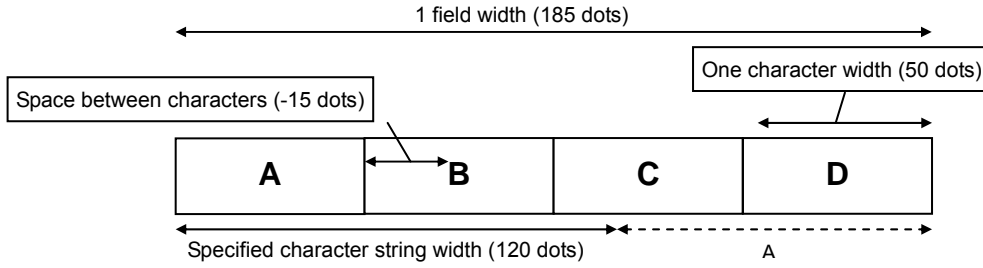
$$\text{One character width} = 1 \text{ character width} - B = 50 \text{ dots} - 24 \text{ dots} = 26 \text{ dots}$$

- Print image when the parameter setting is specified.



* When the number of print data is 6 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ⑤ When one field width \geq specified character string width
(Space between characters < 0 , Specified character string digits = 5)
 - Print image when the parameter setting is omitted.

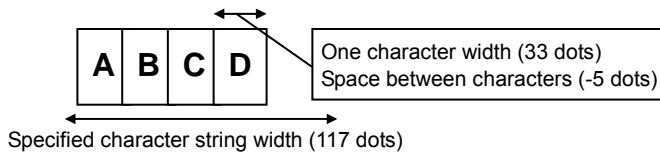


$$A = 1 \text{ field width} - \text{Specified character string width} = 185 \text{ dots} - 120 \text{ dots} = 65 \text{ dots}$$

$$B = A / \text{Data length} = 65 \text{ dots} / 4 = 17 \text{ dots (rounded up)}$$

$$\text{One character width} = 1 \text{ character width} - B = 50 \text{ dots} - 17 \text{ dots} = 33 \text{ dots}$$

- Print image when the parameter setting is specified.



- * When the number of print data is 5 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

(14) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=”.

Up to 255 digits can be printed.

When the number of digits exceeds the maximum number of characters, the excess data will be discarded.

For the character code table, refer to the character code table mentioned later.

(15) Link field No.

The link field No. can be programmed by designating it after the symbol “;”

After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.

Up to 20 fields can be linked.

If the link field exceeds 20 fields, an error occurs.

The following shows an example of linked fields on the two continuous labels.

[Format Command]

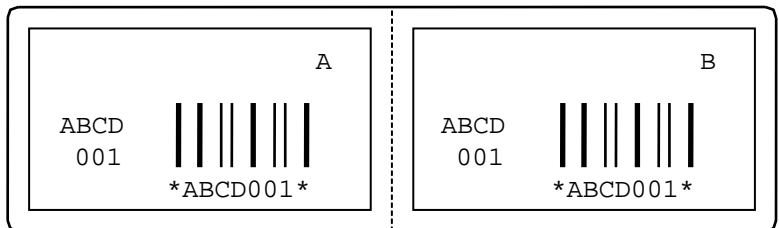
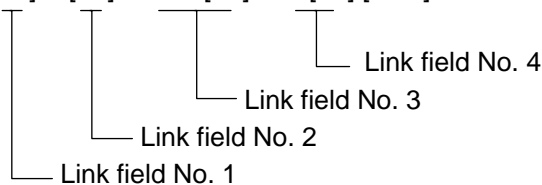
[ESC] PV01; ; 01 [LF] [NUL] : Link field No. 1 is designated.
 [ESC] PV02; ; 03 [LF] [NUL] : Link field No. 3 is designated.
 [ESC] PV03; ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB01; ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[ESC] PV04; ; 02 [LF] [NUL] : Link field No. 2 is designated.
 [ESC] PV05; ; 03 [LF] [NUL] : Link field No. 3 is designated.
 [ESC] PV06; ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB02; ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

Designating the link field No.

[Data Command]

[ESC] RV; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]



Notes

- (1) The check digit attachment, increment/decrement and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

[For example, the zero(s) is replaced by a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.]

Increment/decrement > zero suppression > attachment of check digit

- (2) Up to 32 fields for which increment/decrement has been designated can be drawn. If the total bit map font, outline font and barcode increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Examples]

- 1) Format Command (Incrementing character string No. 01 (+1))
- 2) Format Command (No incrementing character string No. 02)
- 3) Format Command (Incrementing character string No. 03 (+2))
- 4) Image Buffer Clear Command
- 5) Data Command (Character string No. 01 "0001")
- 6) Data Command (Character string No. 02 "AB-")
- 7) Data Command (Character string No. 03 "0100")
- 8) Issue Command (2 labels)

0001

AB-0100

0002

AB-0102

- 9) Issue Command (1 label)

0003

AB-0104

- 10) Image Buffer Clear Command

- 11) Data Command (Character string No. 02 "00000")

- 12) Issue Command (1 label)

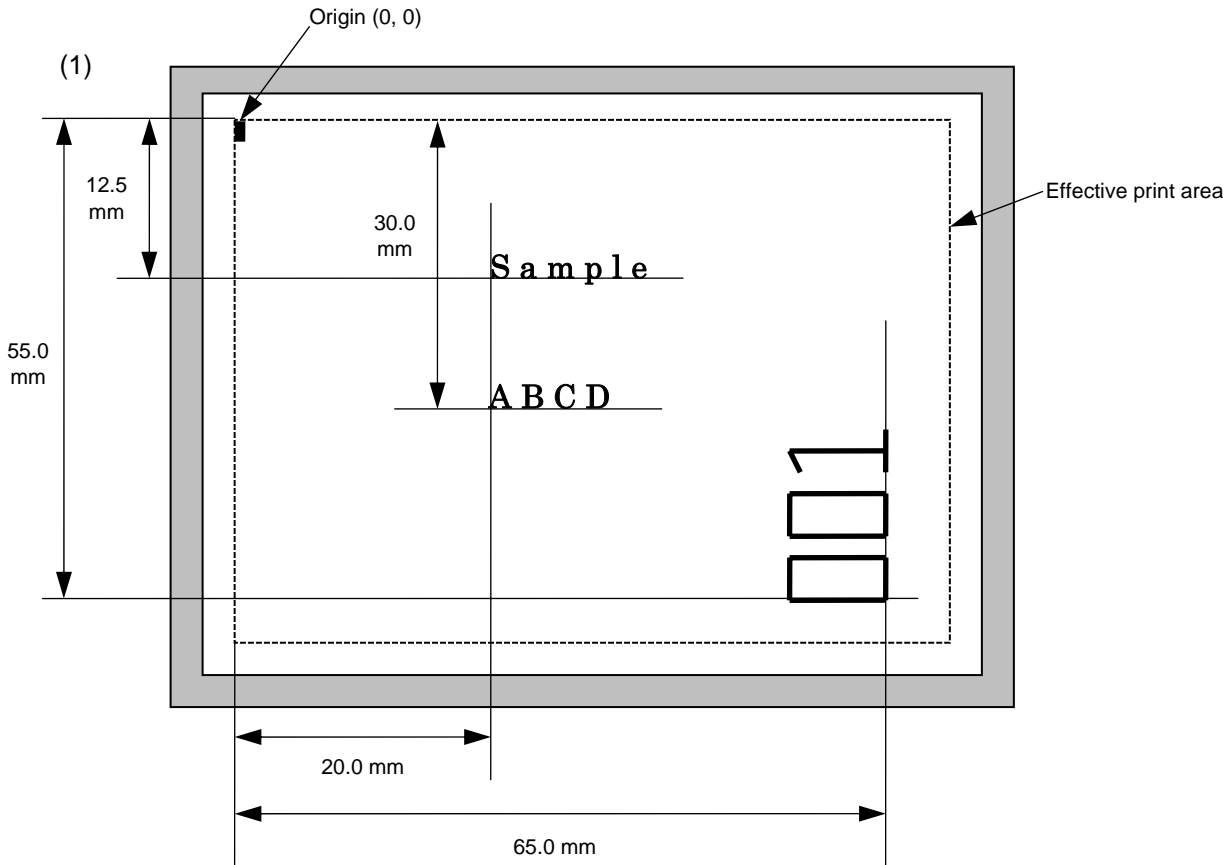
00000

- (3) The Outline Font Format Command may be connected to the Bit Map Font Format Command when transmitted.
- ```
[ESC] PC001; 0100, 0150, 1, 1, A, 00, B [LF]
 C002; 0350, 0180, 1, 1, A, 00, B [LF]
 C005; 0200, 0300, 25, 2, C, +05, 00, B, +0000000001 [LF]
 V01; 0500, 0400, 0100, 0100, A, 00, B [LF] [NUL]
```
- (4) When the drawing data differs for every label, the field of the drawing data for the previous label is automatically cleared using the character string number, then the next drawing data is printed. Therefore, the character string number should be designated so that they differ according to the drawing fields.
- (5) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same character string number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same character string number are automatically cleared until the Clear Command is sent.)
- (6) When characters overlap due to the character-to-character space fine adjustment, the outline font is not painted properly. Program the fine adjustment value so that characters will not overlap. Also, when drawings such as lines or characters are positioned over the outline font area, the outline font is not painted properly. For font types A, B and K, the fine adjustment value should be set so that other drawings do not overlap the area in which the outline font is to be drawn. For font types E, F and G, the fine adjustment value should be set so that other drawings do not overlap the area of the designated character width and height.
- (7) The link field designation can be cleared by omitting the link field designation using the same character string No. and reformatting data.
- The link field designation can also be cleared by the Image Buffer Clear Command.
- (8) A print data string and link field No. cannot be programmed at the same time.
- (9) In the case of the compatible mode for the B-SP series, the reserved area is not checked.

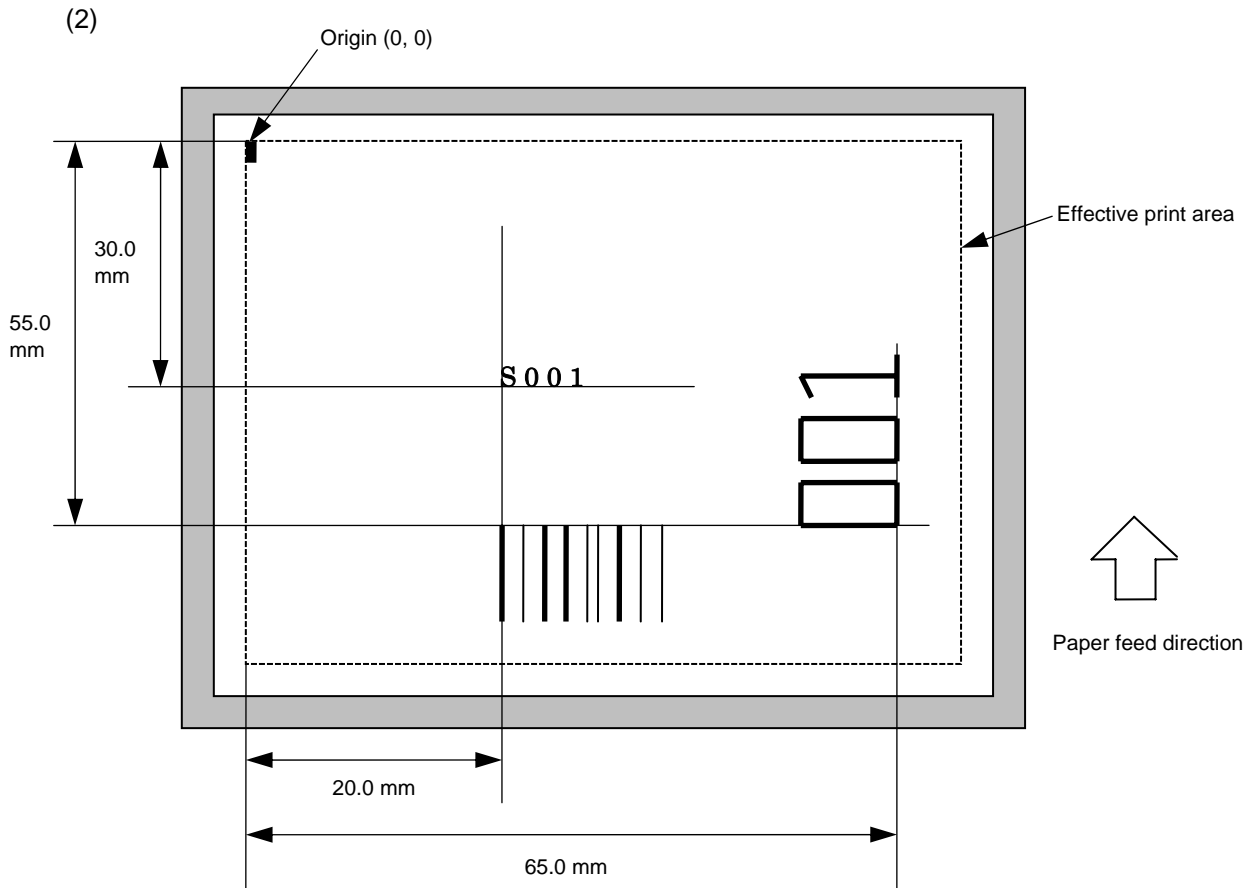
Refer to

- Outline Font Data Command ([ESC] RV)
- Bit Map Font Format Command ([ESC] PC)
- Barcode Format Command ([ESC] XB)

Examples



```
[ESC] C [LF] [NUL]
[ESC] PV00; 0200, 0300, 0080, 0080, B, 00, B=ABCD [LF] [NUL]
[ESC] PV01; 0200, 0125, 0100, 0100, B, 00, B [LF] [NUL]
[ESC] PV02; 0650, 0550, 0200, 0150, B, 33, B, +0000000001 [LF] [NUL]
[ESC] RV01; Sample [LF] [NUL]
[ESC] RV02; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RV; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

5.6.4 BARCODE FORMAT COMMAND

[ESC] XB

Ⓞ In the case of WPC, CODE93, CODE128, UCC/EAN128, EAN128, Customer Barcode, POSTNET, RM4SCC, KIX CODE

|          |                                                                                                                                                                    |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate where and how the barcode is to be printed and how it is to be printed.<br>(WPC is the generic name for barcodes of JAN, EAN and UPC.) |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|        |                                                                                                                                                                                                                                                                                          |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format | <p>① [ESC] XBaa; bbbb, cccc, d, e, ff, k, llll (, mnnnnnnnnnn, ooo, p, qq)<br/>(= sss ----- sss) [LF] [NUL]</p> <p>② [ESC] XBaa; bbbb, cccc, d, e, ff, k, llll (, mnnnnnnnnnn, ooo, p, qq)<br/>(; tt<sub>1</sub>, tt<sub>2</sub>, tt<sub>3</sub>, -----, tt<sub>20</sub>) [LF] [NUL]</p> |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|      |                                                                                                                                                                                                                                                                |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | <p>aa: Barcode number<br/>00 to 31</p> <p>bbbb: X-coordinate of the print origin of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of barcode<br/>4 or 5 digits (in 0.1 mm units)</p> <p>d: Type of barcode</p> |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                     |                                         |
|---------------------------------------------------------------------|-----------------------------------------|
| Compatible mode for the B-SP series: OFF                            | Compatible mode for the B-SP series: ON |
| 0: JAN8, EAN8                                                       |                                         |
| 5: JAN13, EAN13                                                     |                                         |
| 6: UPC-E                                                            |                                         |
| 7: EAN-13 + 2digits                                                 |                                         |
| 8: EAN-13 + 5digits                                                 |                                         |
| 9: CODE128 (with auto code selection)                               |                                         |
| A: CODE128 (without auto code selection)                            |                                         |
| C: CODE93                                                           |                                         |
| G: UPC-E + 2 digits                                                 |                                         |
| H: UPC-E + 5 digits                                                 |                                         |
| I: EAN-8 + 2 digits                                                 |                                         |
| J: EAN-8 + 5 digits                                                 |                                         |
| K: UPC-A                                                            |                                         |
| L: UPC-A + 2 digits                                                 |                                         |
| M: UPC-A + 5 digits                                                 |                                         |
| N: UCC/EAN128                                                       | N: EAN128                               |
| R: Customer barcode (Postal code for Japan)                         |                                         |
| S: Highest priority customer barcode (Postal code for Japan)        |                                         |
| U: POSTNET (Postal code for U.S.A.)                                 |                                         |
| V: RM4SCC (ROYAL MAIL 4 STATE CUSTOMER CODE) (Postal code for U.K.) |                                         |
| W: KIX CODE (Postal code for Belgium)                               |                                         |

- e: Type of check digit
- 1: Without attaching check digit
  - 2: Check digit check
 

|         |            |
|---------|------------|
| WPC     | Modulus 10 |
| CODE93  | Modulus 47 |
| CODE128 | PSEUDO 103 |
  - 3: Check digit auto attachment (1)
 

|                      |                     |
|----------------------|---------------------|
| WPC                  | Modulus 10          |
| CODE93               | Modulus 47          |
| CODE128              | PSEUDO 103          |
| UCC/EAN128 or EAN128 | PSEUDO 103          |
| Customer barcode     | Special check digit |
| POSTNET              | Special check digit |
| RM4SCC               | Special check digit |
  - 4: Check digit auto attachment (2)
 

|     |                                 |
|-----|---------------------------------|
| WPC | Modulus 10 + Price C/D 4 digits |
|-----|---------------------------------|
  - 5: Check digit auto attachment (3)
 

|     |                                 |
|-----|---------------------------------|
| WPC | Modulus 10 + Price C/D 5 digits |
|-----|---------------------------------|
- Note: For the Customer barcode, POSTNET and RM4SCC, only "3: Check digit auto attachment (1)" is effective.
- ff: 1-module width  
01 to 15 (in units of dots)
- k: Rotational angle of barcode
- 0: 0°
  - 1: 90°
  - 2: 180°
  - 3: 270°
- lll: Height of the barcode  
0000 to 1000 (in 0.1 mm units)
- For the Customer barcode, POSTNE and RM4SCC along with KIX CODE, the height of the long bar is specified.
- mnnnnnnnnn: Increment and decrement  
(Omissible. If omitted, increment/decrement is not performed.)
- m: Designates whether to increment or decrement.
  - +: Increment
  - : Decrement
- nnnnnnnnn: Skip value  
0000000000 to 9999999999
- ooo: Length of WPC guard bar  
(Omissible. If omitted, the guard bar is not extended.)  
000 to 100 (in 0.1 mm units)
- p: Selection of print or non-print of numerals under bars  
(Omissible. If omitted, the numerals under the bars are not printed.)
- 0: Non-print
  - 1: Print

qq: No. of digits after zero suppression  
(Omissible. If omitted, zero suppression is not performed.)  
00 to 20

\* Reserved in the case of the compatible mode for the B-SP series

sss ----- sss: Data string to be printed (Omissible)  
Max. 126 digits.  
However, the number of digits varies according to the type of barcode.

tt<sub>1</sub>, tt<sub>2</sub>, tt<sub>3</sub> ----- , tt<sub>20</sub>: Link field No. (Omissible)  
01 to 99 (1 to 99 can also be used.)  
Up to 20 fields can be designated using commas.

- \* Omissible parameters (such as "Increment/decrement," "Selection of print or non-print of numerals under bars" and "No. of digits after zero suppression") cannot be set when the Customer barcode, POSTNET, RM4SCC or KIX CODE is selected.
- \* WPC is the generic name for barcodes of JAN, EAN and UPC.
- \* In the above descriptions, "Customer barcode" includes the highest priority customer barcode.
- \* When the key operation is used to enable the compatible mode for the B-SP series, EAN128 is printed. When the compatible mode for the B-SP series is disabled, UCC/EAN128 is printed.

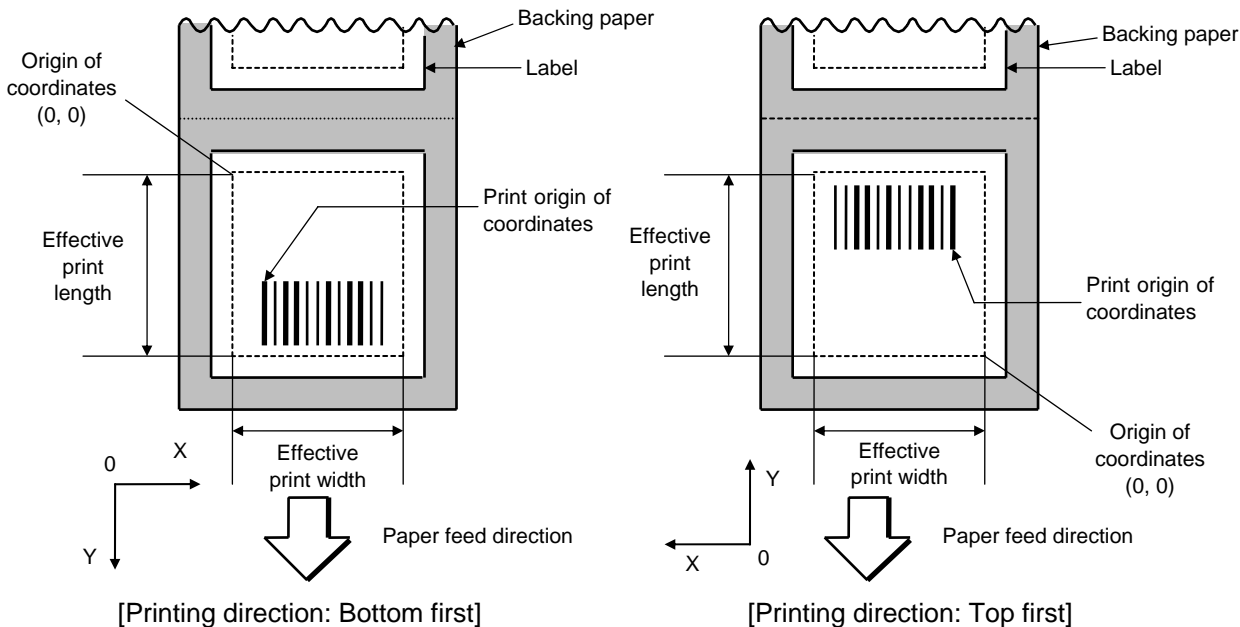


Explanation

- (1) Barcode number

When drawing by the Data Command ([ESC] RB), the format designated by the barcode is selected.

- (2) Print origin of coordinates



The print origin of coordinates must be set so that the barcode drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

- (3) Type of barcode

0: JAN8, EAN8



5: JAN13, EAN13



6: UPC-E



7: EAN13 + 2 digits



8: EAN13 + 5 digits



9: A: CODE128



C: CODE93



G: UPC-E + 2 digits



H: UPC-E + 5 digits



I: EAN8 + 2 digits



J: EAN8 + 5 digits



K: UPC-A



L: UPC-A + 2 digits



M: UPC-A + 5 digits



N: UCC/EAN128



N: EAN128



R: Customer barcode



S: Highest priority customer barcode



U: POSTNET



V: RM4SCC



W: KIX code



(4) Type of check digit

When no check digit is attached, a barcode of the data row will be drawn.

In the case of the check digit check, when each check digit check is performed according to the type of barcode and results in normal, a barcode will be drawn. If the check digit is not proper, the barcode will not be drawn.

When the check digit is automatically attached, each check digit is attached according to the type of barcode when a barcode is drawn.

If the type of barcode is CODE93, CODE128 (with auto code selection), or UCC/EAN128 or EAN128, the check digit will always be attached regardless of the designation of the type of check digit.

If the type of barcode is JAN, EAN or UPC, the designation of no check digit attachment automatically assumes the check digit check.

\* DBP Modulus 10 is Modulus 10 for Deutsche Bundespost Postdienst only.

(5) Bar width, space width, and character-to-character space

Designate the bar, space and character-to-character space widths according to the type of barcode. Note that the proper value differs according to the rotational angle of barcode, type, number of digits, print speed, paper used, etc. Examples of such designations are listed below.

In the case of JAN, EAN, UPC, CODE93, CODE128, UCC/EAN128 or EAN128, the width of 2 to 6 modules is automatically calculated by designating a 1-module width.

[Example of setting]

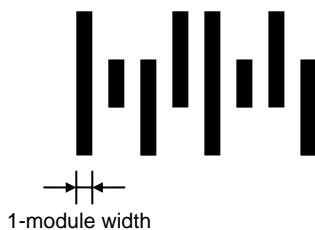
203-dpi print head (1 dot = 1/8 mm)

| Type of barcode                   | 1 module |       | 2 modules |       | 3 modules |       | 4 modules |       | 5 modules |       | 6 modules |       |
|-----------------------------------|----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
|                                   | Bar      | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space |
| JAN, EAN, UPC                     | 3        |       | 6         |       | 9         |       | 12        |       | -         |       | -         |       |
| CODE93                            | 2        |       | 4         |       | 6         |       | 8         |       | -         |       | -         |       |
| CODE128,<br>UCC/EAN128,<br>EAN128 | 2        |       | 4         |       | 6         |       | 8         |       | -         |       | -         |       |

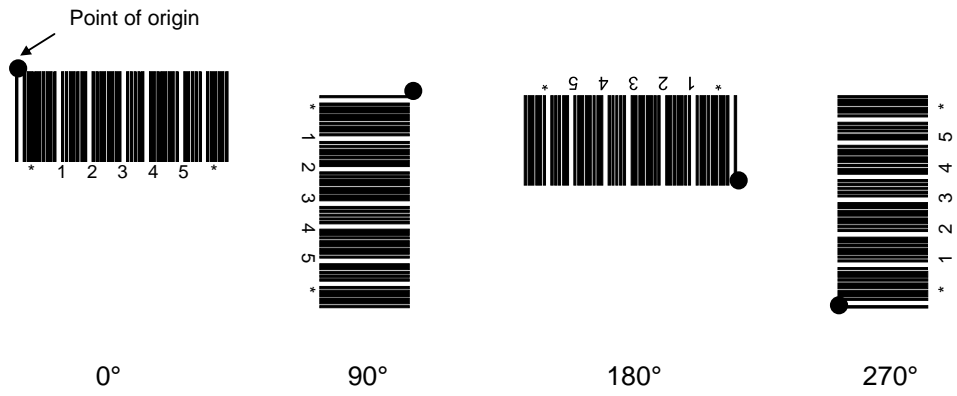
Values to be set in ff: "1-module width"

To be automatically calculated based on the value set in ff: "1-module width"

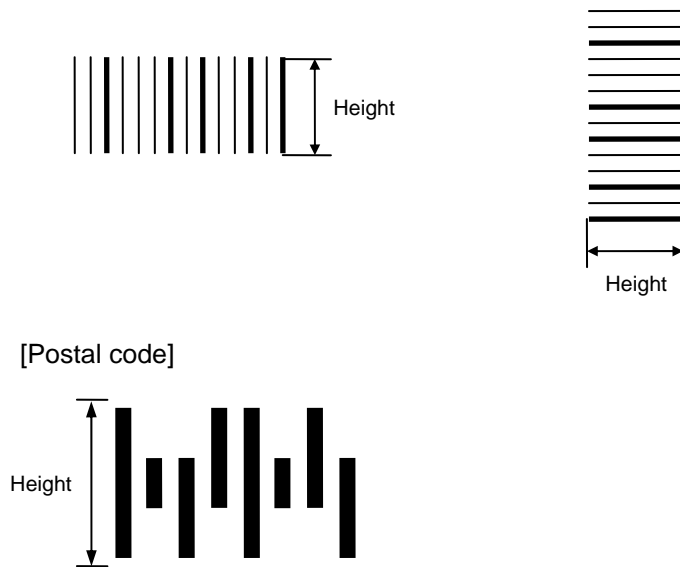
[Customer barcode]



(6) Rotational angle of barcode



(7) Barcode height



(8) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

When CODE128 (without auto code selection) is used, the number of the start code (CODE A, CODE B and CODE C) digits is regarded as 2.

|                  |                |      |      |      |        |
|------------------|----------------|------|------|------|--------|
| Initial value    | 0000           | 0000 | 0000 | 0000 | 999999 |
| INC/DEC          | +10            | +10  | +10  | +10  | +1     |
| Zero suppression | Not designated | 5    | 3    | 0    | 3      |
| 1st label        | 0000           | 0000 | └000 | 0000 | 999999 |
| 2nd label        | 0010           | 0010 | └010 | 0010 | └└└000 |
| 3rd label        | 0020           | 0020 | └020 | 0020 | └└└001 |
| 4th label        | 0030           | 0030 | └030 | 0030 | └└└002 |
| 5th label        | 0040           | 0040 | └040 | 0040 | └└└003 |

Letters and numerals for increment/decrement

For CODE93 and CODE128, even if a data string other than numerals are included in the data, increment/decrement is performed. However, if any code which does not exist in each barcode table is contained in the data, increment/decrement is not performed.

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

|               |       |       |       |       |
|---------------|-------|-------|-------|-------|
| Initial value | 00000 | A0A0A | 7A8/9 | A2A0A |
| INC/DEC       | +1    | +1    | +3    | -3    |
| 1st label     | 00000 | A0A0A | 7A8/9 | A2A0A |
| 2nd label     | 00001 | A0A1A | 7A9/2 | A1A7A |
| 3rd label     | 00002 | A0A2A | 7A9/5 | A1A4A |
| 4th label     | 00003 | A0A3A | 7A9/8 | A1A1A |
| 5th label     | 00004 | A0A4A | 8A0/1 | A0A8A |

Increment/decrement of data including the special codes of CODE128

Increment/decrement calculation starts from the lowest digit in the data strings. If the data string to be calculated is numeric and the next (upper) digit is ">," this data is a special code (underlined digits shown in the table below). In such case, these two digits are skipped, and the next digit is calculated.

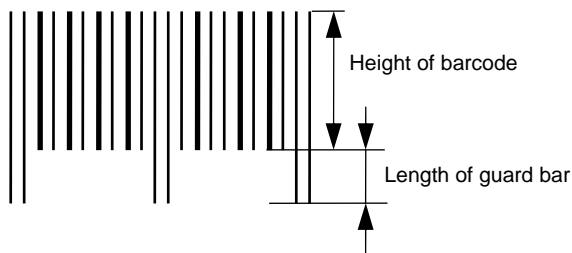
Example of increment/decrement calculation of CODE128

|               |       |         |         |          |
|---------------|-------|---------|---------|----------|
| Initial value | 00000 | 00 > 08 | 0A > 08 | 0A9 > 08 |
| INC/DEC       | +1    | +1      | +1      | +1       |
| 1st label     | 00000 | 00 > 08 | 0A > 08 | 0A9 > 08 |
| 2nd label     | 00001 | 00 > 09 | 0A > 09 | 0A9 > 09 |
| 3rd label     | 00002 | 01 > 00 | 1A > 00 | 1A0 > 00 |
| 4th label     | 00003 | 01 > 01 | 1A > 01 | 1A0 > 01 |
| 5th label     | 00004 | 01 > 02 | 1A > 02 | 1A0 > 02 |

(9) Length of guard bar

The length of guard bar is valid only when the type of barcode is WPC.

It is ignored in all other cases.



(10) Numerals under bars

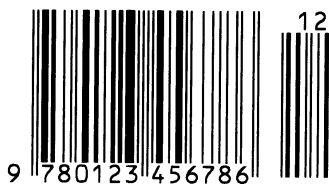
Numerals are/are not provided under bars according to the parameter for print/non print of numerals under bars. The numerals under bars to be printed vary according to the type of barcode.

The font of numerals under bars is OCR-B. These numerals are enlarged or reduced only horizontally according to the width of the barcode. When they are drawn vertically, no enlargement or reduction is applied.

[Drawing positions of numerals under bars]

① JAN and EAN

(Example) EAN13 + 2 digits

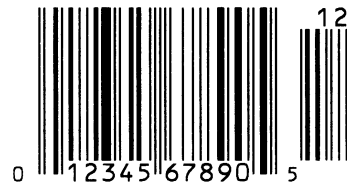


(Example) EAN8



② UPC

(Example) UPC-A + 2 digits



(Example) UPC-E



③ Barcodes other than JAN, EAN and UPC

(Example) CODE39



(Example) UCC/EAN128 or EAN128



(11) Zero suppression

| No. of digits after zero suppression | 0    | 1    | 2    | 2    | 3    | 4    | 5    |
|--------------------------------------|------|------|------|------|------|------|------|
| Data                                 | 0000 | 0000 | 0000 | 0A12 | 0123 | 0123 | 0123 |
| Print                                | 0000 | 000  | 00   | A12  | 123  | 0123 | 0123 |

Zero(s) in a data row is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data row, the data row will be drawn without performing zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

When the print data including start/stop codes are sent, the start/stop codes are also counted as a digit each.

When the barcode type is JAN, EAN, UPC, UCC/EAN 128 or EAN128, the data will be drawn without performing zero suppression.

(12) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=”.

The maximum number of digits to be printed varies according to the type of barcode. For codes, refer to the barcode table mentioned later.

(13) Link field No.

The link field No. can be programmed by designating it after the symbol “;”.

After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.

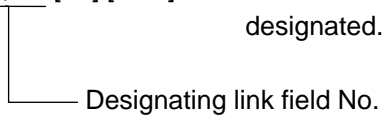
Up to 20 fields can be linked.

The following shows an example of linked fields on the two continuous labels.

[Format Command]

[ESC] PC01; ..... ; 01 [LF] [NUL] : Link field No. 1 is designated.  
 [ESC] PC02; ..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC03; ..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB01; ..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

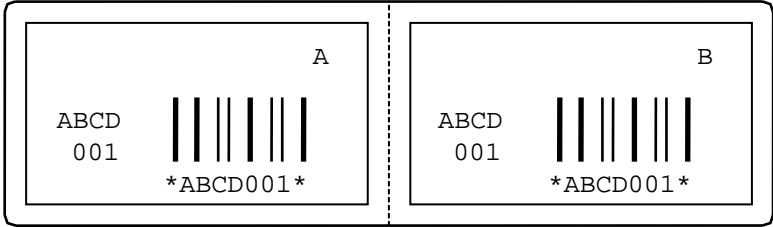
[ESC] PC04; ..... ; 02 [LF] [NUL] : Link field No. 2 is designated.  
 [ESC] PC05; ..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC06; ..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB02; ..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.





[Data Command]  
[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]

Link field No. 4  
Link field No. 3  
Link field No. 2  
Link field No. 1



Notes

- (1) The check digit attachment, increment/decrement and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

[ For example, the zero(s) is replaced with a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated. ]

Increment/decrement > zero suppression > attachment of check digit

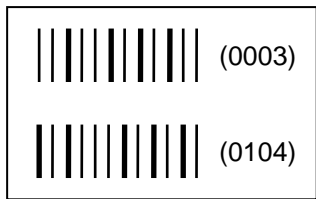
- (2) Up to 32 fields for which increment/decrement has been designated can be drawn. If the total of bit map font, outline font and barcode increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Example]

- 1) Format Command (Incrementing barcode No. 01 (+1))
- 2) Format Command (Incrementing barcode No. 02 (+2))
- 3) Image Buffer Clear Command
- 4) Data Command (Barcode No. 01 "0001")
- 5) Data Command (Barcode No. 02 "0100")
- 6) Issue Command (2 labels)



- 7) Issue Command (1 label)



- 8) Image Buffer Clear Command
- 9) Data Command (Barcode No. 02 "3000")
- 10) Issue Command (1 label)

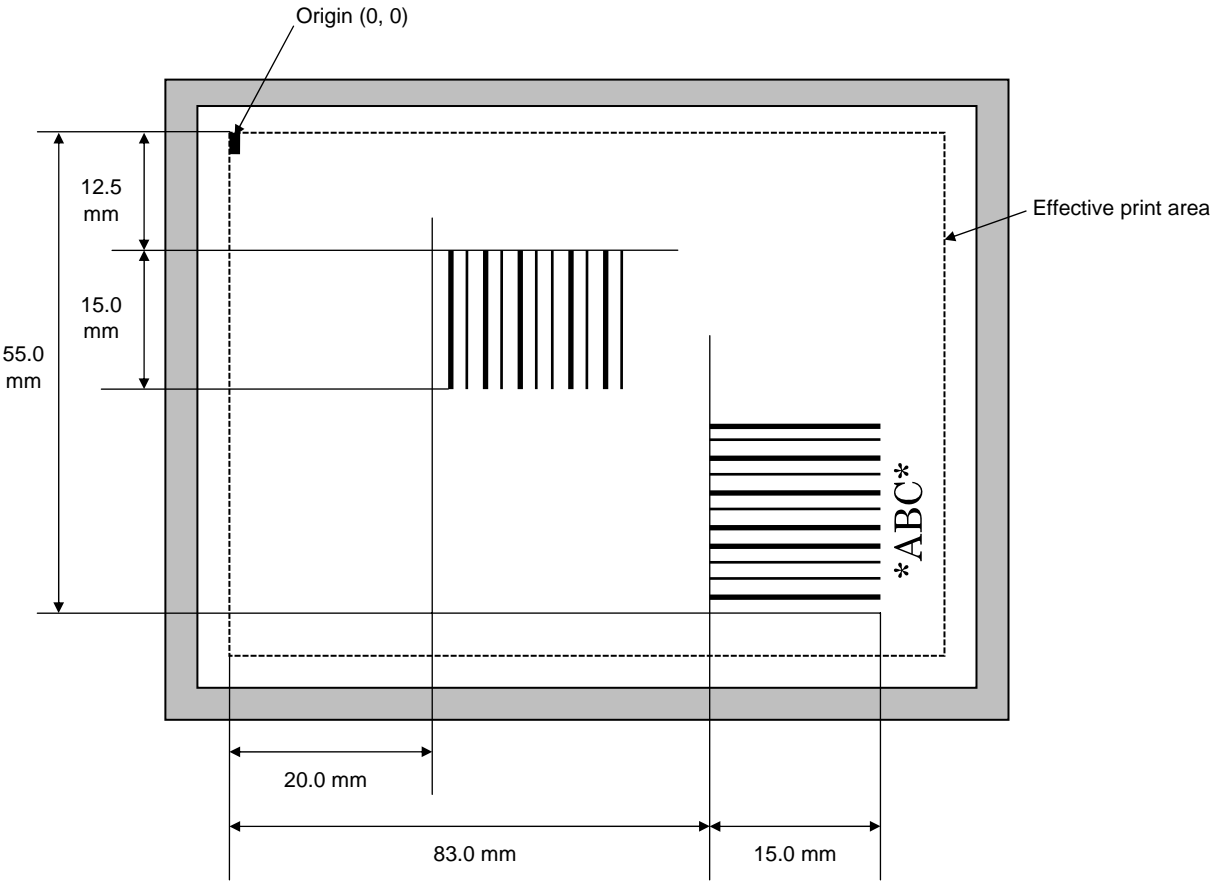


- (3) More than one Barcode Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (4) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the barcode number, then the next drawing data is printed. Therefore, the barcode number which differs according to the drawing fields should be designated.
- (5) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same barcode number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same barcode number are automatically cleared until the Clear Command is sent.)
- (6) The link field designation is cleared by omitting the link field designation using the same barcode No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (7) A print data string and link field No. cannot be programmed at the same time.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)

Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 9, 3, 02, 0, 0150, +0000000000, 010, 0, 00 = 12345 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

5.6.5 BARCODE FORMAT COMMAND

[ESC] XB

Ⓞ In the case of MSI, Interleaved 2 of 5, CODE39, NW7, Industrial 2 of 5, MATRIX 2 of 5 for NEC

- |        |                                                                                                                                                                                                                                                                                                                            |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format | <p>① [ESC] XBaa; bbbb, cccc, d, e, ff, gg, hh, ii, jj, k, llll (, mnnnnnnnnnn, p, qq) (, r)<br/>(= sss ----- sss) [LF] [NUL]</p> <p>② [ESC] XBaa; bbbb, cccc, d, e, ff, gg, hh, ii, jj, k, llll (, mnnnnnnnnnn, p, qq) (, r)<br/>(; tt<sub>1</sub>, tt<sub>2</sub>, tt<sub>3</sub>, -----, tt<sub>20</sub>) [LF] [NUL]</p> |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | <p>aa: Barcode number<br/>00 to 31</p> <p>bbbb: X-coordinate of the print origin of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of barcode<br/>4 or 5 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>1: MSI<br/>2: Interleaved 2 of 5 (ITF)<br/>3: CODE39 (standard)<br/>4: NW7<br/>B: CODE39 (full ASCII)<br/>O: Industrial 2 of 5<br/>a: MATRIX 2 of 5 for NEC</p> <p>e: Type of check digit<br/>1: Without attaching check digit<br/>2: Check digit check<br/>CODE39 Modulus 43<br/>MSI IBM modulus 10<br/>ITF Modulus 10<br/>Industrial 2 of 5 Modulus check character<br/>MATRIX 2 of 5 for NEC Modulus check character<br/>3: Check digit automatic attachment (1)<br/>CODE39 Modulus 43<br/>MSI IBM modulus 10<br/>ITF Modulus 10<br/>Industrial 2 of 5 Modulus check character<br/>MATRIX 2 of 5 for NEC Modulus check character<br/>4: Check digit automatic attachment (2)<br/>MSI IBM modulus 10 + IBM modulus 10<br/>ITF DBP Modulus 10<br/>5: Check digit automatic attachment (3)<br/>MSI IBM modulus 11 + IBM modulus 10</p> <p>ff: Narrow bar width<br/>01 to 99 (in units of dots)</p> <p>gg: Narrow space width<br/>01 to 99 (in units of dots)</p> |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\* In the case of industrial 2 of 5, designate an element-to-element space.

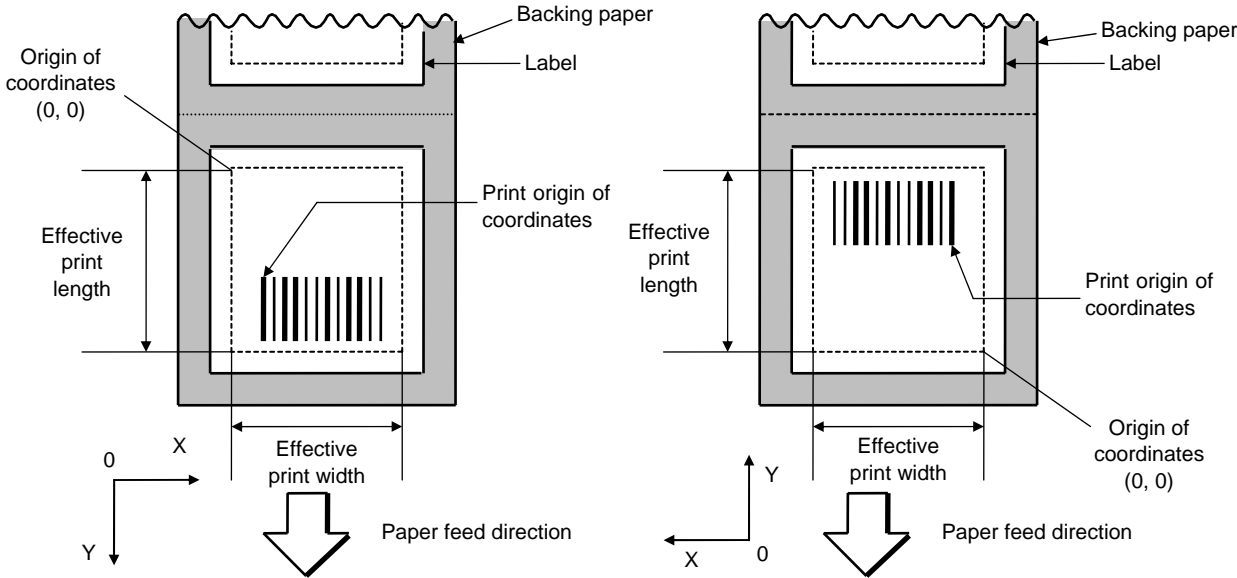
- hh: Wide bar width  
01 to 99 (in units of dots)
- ii: Wide space width  
01 to 99 (in units of dots)  
\* In the case of industrial 2 of 5, the value is fixed at 00.
- jj: Character-to-character space width  
01 to 99 (in units of dots)  
\* In the case of MSI and ITF, the character-to-character space width is fixed at 00.
- k: Rotational angle of barcode  
0: 0°  
1: 90°  
2: 180°  
3: 270°
- lll: Height of barcode  
0000 to 1000 (in 0.1 mm units)
- mnnnnnnnnn: Increment/decrement  
(Omissible. If omitted, increment/decrement is not performed.)  
m: Indicates whether to increment or decrement  
+: Increment  
-: Decrement
- nnnnnnnnnn: Skip value  
0000000000 to 9999999999
- p: Selection of print or non-print of numerals under bars  
(Omissible. If omitted, the numerals under the bars are not printed.)  
0: Non-print  
1: Print
- qq: No. of digits after zero suppression  
(Omissible. If omitted, zero suppression is not performed.)  
00 to 20  
\* Reserved in the case of the compatible mode for the B-SP series
- r: Designates the attachment of start/stop code  
(Omissible. If omitted, the start/stop code is automatically attached.)  
T: Attachment of start code only  
P: Attachment of stop code only  
N: Start/stop code unattached
- sss ----- sss: Data string to be printed (Omissible)  
Max. 126 digits.  
However, the number of digits varies according to the type of barcode.
- tt<sub>1</sub>, tt<sub>2</sub>, tt<sub>3</sub>, -----, tt<sub>20</sub>: Link field No. (Omissible)  
01 to 99 (1 to 99 can also be used.)  
Up to 20 fields can be designated using commas.

**Explanation**

(1) Barcode number

When drawing by the Data Command ([ESC] RB), the format designated by the barcode is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the barcode drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

(3) Type of barcode

1: MSI



2: Interleaved 2 of 5



3: CODE39 (standard)



4: NW7



B: CODE39 (Full ASCII)



O: Industrial 2 of 5



a: Matrix 2 of 5 for NEC



(4) Type of check digit

When no check digit is attached, a barcode of the data row will be drawn.

In the case of the check digit check, when each check digit check is performed according to the type of barcode and results in normal, a barcode will be drawn. If the check digit is not proper, the barcode will not be drawn.

When the check digit is automatically attached, each check digit is attached according to the type of barcode when a barcode is drawn.

\* DBP Modulus 10 is Modulus 10 for Deutsche Bundespost Postdienst only.

(5) Bar width, space width, and character-to-character space

Designate the bar, space, and character-to-character space widths according to the type of barcode. Note that the designated proper value differs according to the rotational angle of barcode, type, number of digits, print speed, paper used, etc. Examples of such designations are listed below.

When NW7 is used, transmission of the space character assumes a space equals to 'a narrow space x12 dots'. In this case, the space is max. 255 dots.

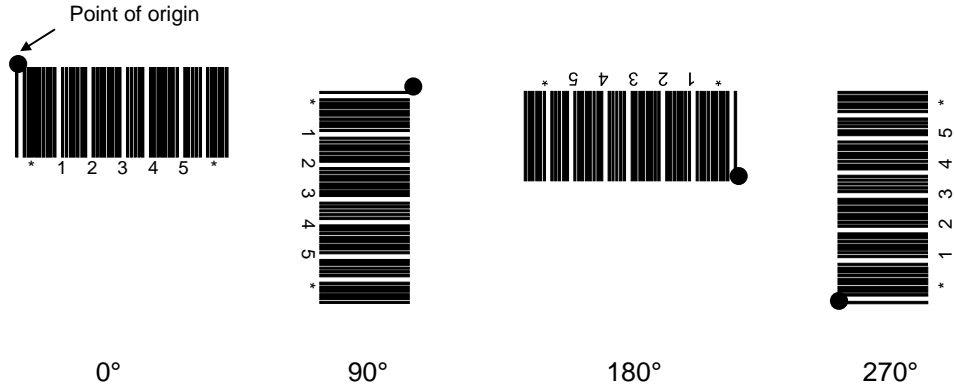
[Example of setting]

203-dpi print head (1 dot = 1/8 mm)

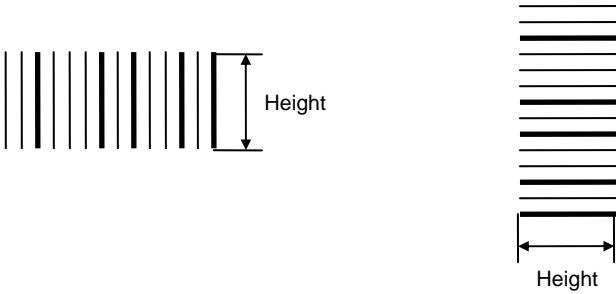
| Type of barcode   | Narrow |       | Wide |       | Character-to-character space |
|-------------------|--------|-------|------|-------|------------------------------|
|                   | Bar    | Space | Bar  | Space |                              |
| MSI               | 2      | 2     | 6    | 6     | 0                            |
| ITF               | 2      | 2     | 6    | 6     | 0                            |
| CODE39            | 2      | 2     | 6    | 6     | 2                            |
| NW7               | 2      | 2     | 6    | 6     | 2                            |
| Industrial 2 of 5 | 2      | 2     | 6    | 0     | 2                            |
| MATRIX 2 of 5     | 2      | 2     | 6    | 6     | 2                            |



(6) Rotational angle of barcode



(7) Barcode height



(8) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

|                  |                |      |      |      |        |
|------------------|----------------|------|------|------|--------|
| Initial value    | 0000           | 0000 | 0000 | 0000 | 999999 |
| INC/DEC          | +10            | +10  | +10  | +10  | +1     |
| Zero suppression | Not designated | 5    | 3    | 0    | 3      |
| 1st label        | 0000           | 0000 | └000 | 0000 | 999999 |
| 2nd label        | 0010           | 0010 | └010 | 0010 | └└└000 |
| 3rd label        | 0020           | 0020 | └020 | 0020 | └└└001 |
| 4th label        | 0030           | 0030 | └030 | 0030 | └└└002 |
| 5th label        | 0040           | 0040 | └040 | 0040 | └└└003 |

Letters and numerals for increment/decrement

For CODE39 (standard), CODE39 (full ASCII) and NW-7, even if a data string other than numerals are included in the data, increment/decrement is performed. However, if any code which does not exist in each barcode table is contained in the data, increment/decrement is not performed.

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

|               |       |       |       |       |
|---------------|-------|-------|-------|-------|
| Initial value | 00000 | A0A0A | 7A8/9 | A2A0A |
| INC/DEC       | +1    | +1    | +3    | -3    |
| 1st label     | 00000 | A0A0A | 7A8/9 | A2A0A |
| 2nd label     | 00001 | A0A1A | 7A9/2 | A1A7A |
| 3rd label     | 00002 | A0A2A | 7A9/5 | A1A4A |
| 4th label     | 00003 | A0A3A | 7A9/8 | A1A1A |
| 5th label     | 00004 | A0A4A | 8A0/1 | A0A8A |

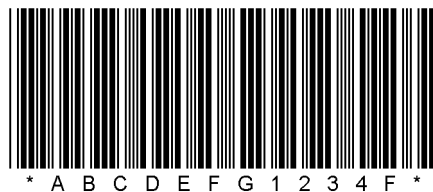
(9) Numerals under bars

Numerals are/are not provided under bars according to the parameter for print/non print of numerals under bars. The numerals under bars to be printed vary according to the type of barcode.

The font of numerals under bars is OCR-B. These numerals are enlarged or reduced only horizontally according to the width of the barcode. When they are drawn vertically, no enlargement or reduction is applied.

[Drawing positions of numerals under bars]

CODE39



(10) Zero suppression

|                                      |      |      |      |      |      |      |      |
|--------------------------------------|------|------|------|------|------|------|------|
| No. of digits after zero suppression | 0    | 1    | 2    | 2    | 3    | 4    | 5    |
| Data                                 | 0000 | 0000 | 0000 | 0A12 | 0123 | 0123 | 0123 |
| Print                                | 0000 | ┌┌┌0 | ┌┌00 | ┌A12 | ┌123 | 0123 | 0123 |

Zero(s) in a data row is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data row, the data row will be drawn without performing zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

When the print data including start/stop codes are sent, the start/stop codes are also counted as a digit each.

(11) Start/stop code

This parameter is effective only when the type of barcode is CODE39 and NW7.

When the parameter is designated, whether or not the stop code and the start code are attached to the print data to be sent is not checked.

When the parameter is omitted in the case of CODE39 and NW7, a start/stop code will be attached. The code to be added is "\*" in the case of CODE39, and "a" in the case of NW7.

For details, refer to "AUTOMATIC ADDITION OF START/STOP CODES."

(12) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=”.

The maximum number of digits to be printed varies according to the type of barcode. For codes, refer to the barcode table mentioned later.

(13) Link field No.

The link field No. can be programmed by designating it after the symbol “;”.

After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.

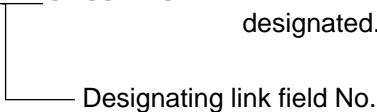
Up to 20 fields can be linked.

The following shows an example of linked fields on the two continuous labels.

[Format Command]

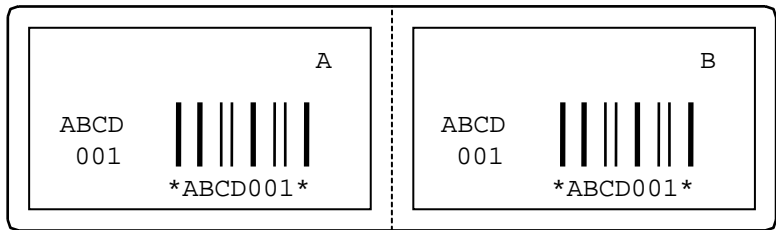
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.  
 [ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.  
 [ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.



[Data Command]

[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]



Notes

- (1) The check digit attachment, increment/decrement and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

For example, the zero(s) is replaced with a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.

Increment/decrement > zero suppression > attachment of check digit

- (2) Up to 32 fields for which increment/decrement has been designated can be drawn. If the total of bit map font, outline font and barcode increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Example]

- 1) Format Command (Incrementing barcode No. 01 (+1))
- 2) Format Command (Incrementing barcode No. 02 (+2))
- 3) Image Buffer Clear Command
- 4) Data Command (Barcode No. 01 "0001")
- 5) Data Command (Barcode No. 02 "0100")
- 6) Issue Command (2 labels)



- 7) Issue Command (1 label)



- 8) Image Buffer Clear Command
- 9) Data Command (Barcode No. 02 "3000")
- 10) Issue Command (1 label)

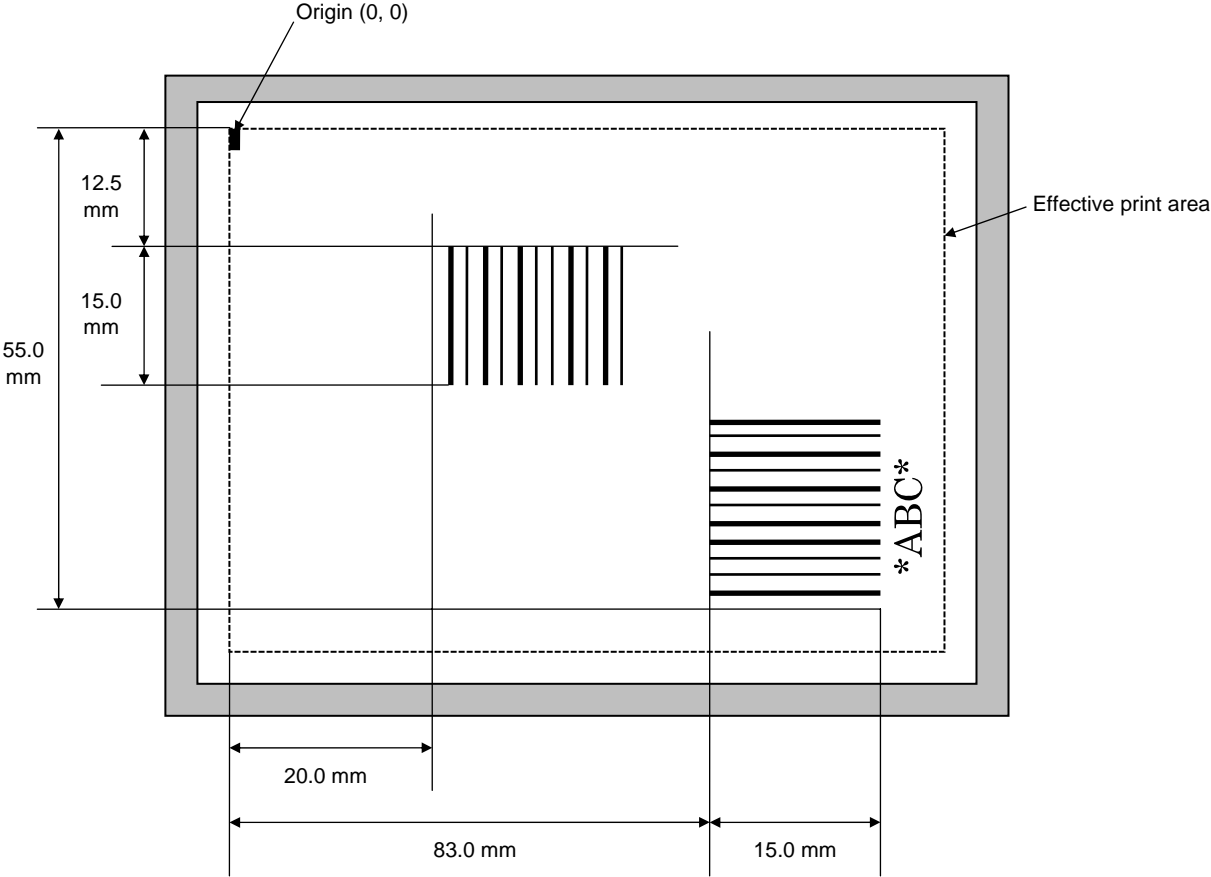


- (3) More than one Barcode Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (4) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the barcode number, then the next drawing data is printed. Therefore, the barcode number which differs according to the drawing fields should be designated.
- (5) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same barcode number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same barcode number are automatically cleared until the Clear Command is sent.)
- (6) The link field designation is cleared by omitting the link field designation using the same barcode No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (7) A print data string and link field No. cannot be programmed at the same time.
- (8) In the case of the compatible mode for the B-SP series, the reserved area is not checked.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)

Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 02, 02, 06, 06, 02, 0, 0150 = 12345 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

5.6.6 BARCODE FORMAT COMMAND

[ESC] XB

Ⓞ In the case of GS1 Databar

|        |                                                                                                                                                                                                                                                             |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format | ① [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh (, ijxxxxxxxx, kk) (= sss ----- sss) [LF] [NUL]<br>② [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh (, ijxxxxxxxx, kk) (; tt <sub>1</sub> , tt <sub>2</sub> , tt <sub>3</sub> , -----, tt <sub>20</sub> ) [LF] [NUL] |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | <p>aa: Barcode number<br/>00 to 31</p> <p>bbbb: X-coordinate of the print origin of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of barcode<br/>4 or 5 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>b: GS1 Databar family</p> <p>e: Version (Type of GS1 Databar)<br/>1: GS1 Databar Omni-directional<br/>2: GS1 Databar Stacked<br/>3: GS1 Databar Stacked Omni-directional<br/>4: GS1 Databar Limited<br/>5: GS1 Databar Expanded<br/>6: GS1 Databar Expanded Stacked</p> <p>ff: 1-module width<br/>01 to 15 (in units of dots)</p> <p>g: Rotational angle of barcode<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>hhhh: Height of the barcode<br/>0000 to 1000 (in 0.1 mm units)</p> <p>ijxxxxxxxx: Increment/decrement<br/>(Omissible. If omitted, increment/decrement is not performed.)<br/>i: Indicates whether to increment or decrement<br/>+: Increment<br/>-: Decrement</p> <p>jjxxxxxxxx: Skip value<br/>0000000000 to 9999999999</p> <p>kk: No. of digits after zero suppression<br/>(Omissible. If omitted, zero suppression is not performed.)<br/>00 to 20</p> |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\* Reserved in the case of the compatible mode for the B-SP series

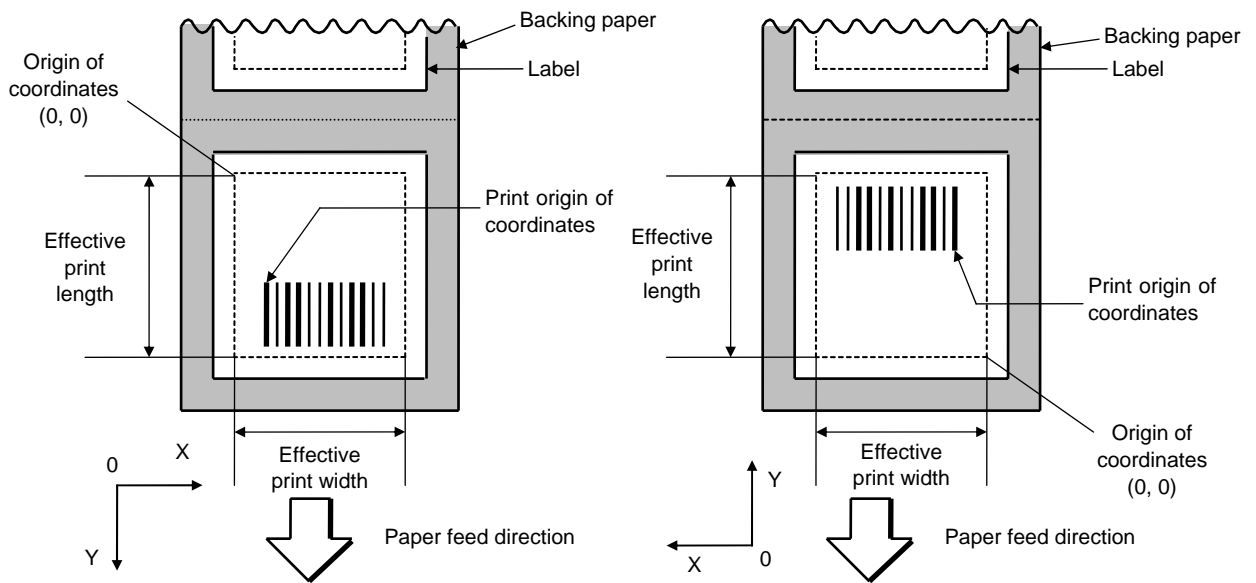
- sss ----- sss: Data string to be printed (Omissible)  
Max. 126 digits.  
However, the number of digits varies according to the type of barcode.
- tt<sub>1</sub>, tt<sub>2</sub>, tt<sub>3</sub>, -----, tt<sub>20</sub>: Link field No. (Omissible)  
01 to 99 (1 to 99 can also be used.)  
Up to 20 fields can be designated using commas.

**Explanation**

(1) Barcode number

When drawing by the Data Command ([ESC] RB), the format designated by the barcode is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the barcode drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).



(3) Type of barcode (Detailed version types)

1: GS1 Databar Omni-directional



2: GS1 Databar Stacked



3: GS1 Databar Stacked Omni-directional



4: GS1 Databar Limited



5: GS1 Databar Expanded



6: GS1 Databar Expanded Stacked



(4) Bar width, space width, and character-to-character space

Designate the bar, space, and character-to-character space widths according to the type of barcode. Note that the designated proper value differs according to the rotational angle of barcode, type, number of digits, print speed, paper used, etc. Examples of such designations are listed below.

The width of 2 to 4 modules is automatically calculated by designating a 1-module width.

[Example of setting]

203-dpi print head (1 dot = 1/8 mm)

| 1 module |       | 2 module |       | 3 module |       | 4 module |       |
|----------|-------|----------|-------|----------|-------|----------|-------|
| Bar      | Space | Bar      | Space | Bar      | Space | Bar      | Space |
| 2        |       | 4        |       | 6        |       | 8        |       |
| 3        |       | 6        |       | 9        |       | 12       |       |

(5) Rotational angle of barcode

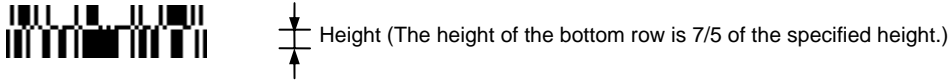


(6) Barcode height

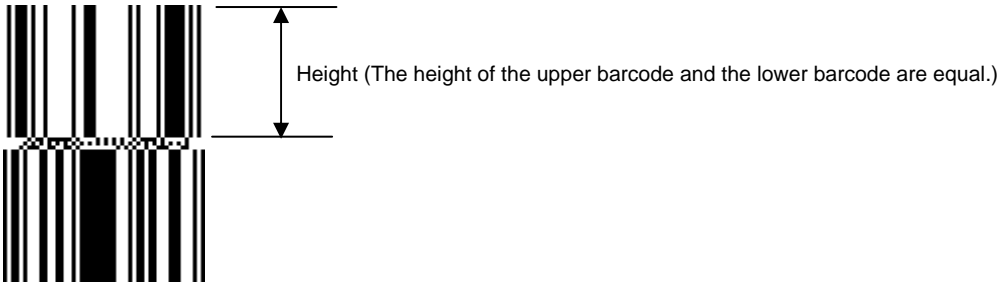
[GS1 Databar Omni-directional]



[GS1 Databar Stacked]



[GS1 Databar Stacked Omni-directional]



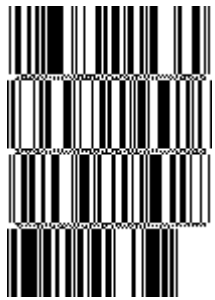
[GS1 Databar Limited]



[GS1 Databar Expanded]



[GS1 Databar Expanded Stacked]



When the barcode height is set to 0000, a barcode (including guard bars) and numerals under bars are not drawn. However, the barcode printed on the previous label is cleared.

(7) Increment/decrement

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

|                  |                |      |      |      |        |
|------------------|----------------|------|------|------|--------|
| Initial value    | 0000           | 0000 | 0000 | 0000 | 999999 |
| INC/DEC          | +10            | +10  | +10  | +10  | +1     |
| Zero suppression | Not designated | 5    | 3    | 0    | 3      |
| 1st label        | 0000           | 0000 | └000 | 0000 | 999999 |
| 2nd label        | 0010           | 0010 | └010 | 0010 | └└└000 |
| 3rd label        | 0020           | 0020 | └020 | 0020 | └└└001 |
| 4th label        | 0030           | 0030 | └030 | 0030 | └└└002 |
| 5th label        | 0040           | 0040 | └040 | 0040 | └└└003 |

Letters and numerals for increment/decrement

For the data string, up to 40 digits (including letters, numerals, and symbols) are possible. Only the numerals are selected and calculated for incrementing/decrementing, and then are returned to the previous position to draw the data.

Example of increment/decrement calculation

|               |       |       |       |       |
|---------------|-------|-------|-------|-------|
| Initial value | 00000 | A0A0A | 7A8/9 | A2A0A |
| INC/DEC       | +1    | +1    | +3    | -3    |
| 1st label     | 00000 | A0A0A | 7A8/9 | A2A0A |
| 2nd label     | 00001 | A0A1A | 7A9/2 | A1A7A |
| 3rd label     | 00002 | A0A2A | 7A9/5 | A1A4A |
| 4th label     | 00003 | A0A3A | 7A9/8 | A1A1A |
| 5th label     | 00004 | A0A4A | 8A0/1 | A0A8A |

(8) Zero suppression

|                                      |      |      |      |      |      |      |      |
|--------------------------------------|------|------|------|------|------|------|------|
| No. of digits after zero suppression | 0    | 1    | 2    | 2    | 3    | 4    | 5    |
| Data                                 | 0000 | 0000 | 0000 | 0A12 | 0123 | 0123 | 0123 |
| Print                                | 0000 | └└└0 | └└00 | └A12 | └123 | 0123 | 0123 |

Zero(s) in a data row is replaced with a space(s) from the upper digits, according to the designated number of digits. However, if the number of digits after zero suppression is greater than the data row, the data row will be drawn without performing zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

When the print data including start/stop codes are sent, the start/stop codes are also counted as a digit each.

(9) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=”.

The maximum number of digits to be printed varies according to the type of barcode. For codes, refer to the barcode table mentioned later.

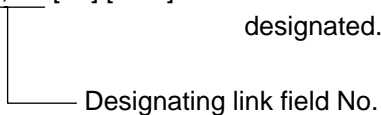
(10) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”  
After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.  
Up to 20 fields can be linked.  
The following shows an example of linked fields on the two continuous labels.

[Format Command]

```
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.
[ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.

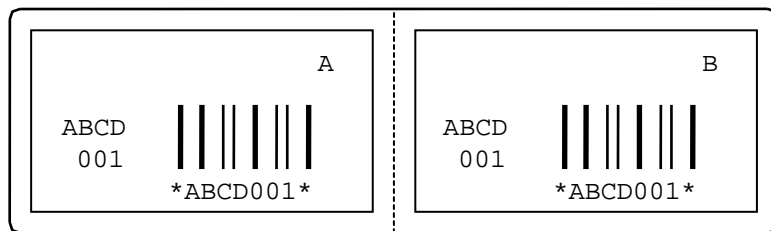
[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.
[ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.
```



[Data Command]

```
[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]
```

Link field No. 4  
Link field No. 3  
Link field No. 2  
Link field No. 1



Notes

- (1) The check digit attachment, increment/decrement and zero suppression are performed according to the following priority. If any of the conditions is improper, no drawing will take place.

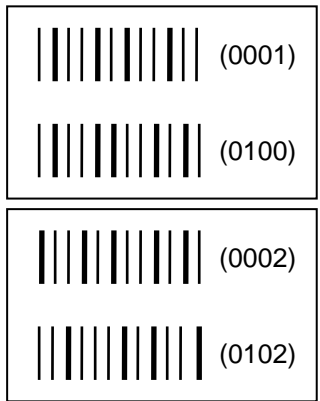
For example, the zero(s) is replaced with a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.

Increment/decrement > zero suppression > attachment of check digit

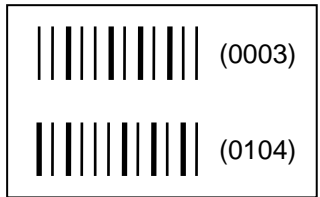
- (2) Up to 32 fields for which increment/decrement has been designated can be drawn. If the total of bit map font, outline font and barcode increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented is incremented or decremented until the Image Buffer Clear Command ([ESC] C) is transmitted.

[Example]

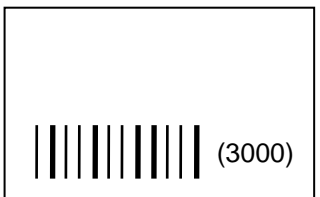
- 1) Format Command (Incrementing barcode No. 01 (+1))
- 2) Format Command (Incrementing barcode No. 02 (+2))
- 3) Image Buffer Clear Command
- 4) Data Command (Barcode No. 01 "0001")
- 5) Data Command (Barcode No. 02 "0100")
- 6) Issue Command (2 labels)



- 7) Issue Command (1 label)



- 8) Image Buffer Clear Command
- 9) Data Command (Barcode No. 02 "3000")
- 10) Issue Command (1 label)

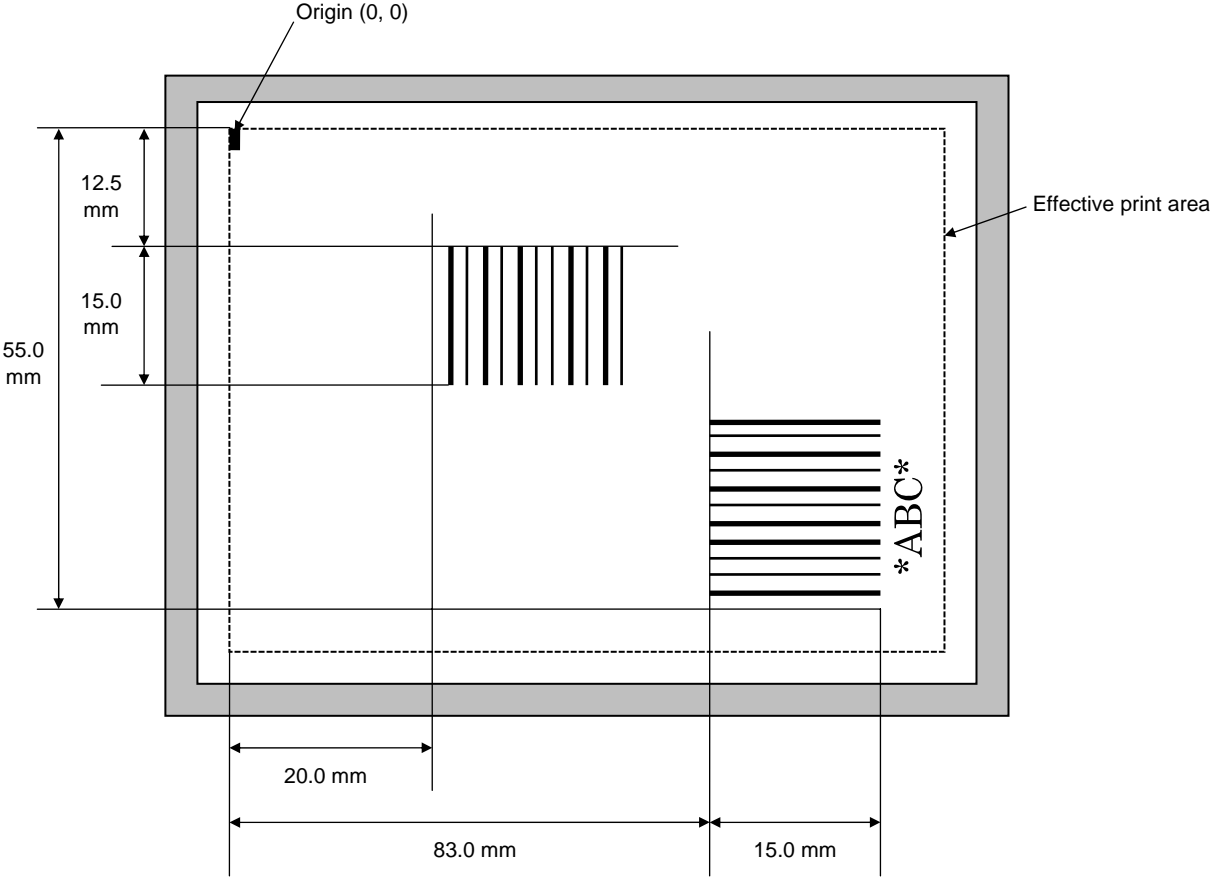


- (3) More than one Barcode Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (4) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the barcode number, then the next drawing data is printed. Therefore, the barcode number which differs according to the drawing fields should be designated.
- (5) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same barcode number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same barcode number are automatically cleared until the Clear Command is sent.)
- (6) The link field designation is cleared by omitting the link field designation using the same barcode No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (7) A print data string and link field No. cannot be programmed at the same time.
- (8) In the case of the compatible mode for the B-SP series, the reserved area is not checked.

|          |
|----------|
| Refer to |
|----------|

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)

Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 03, 03, 08, 08, 03, 0, 0150 = 12345 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



### 5.6.7 TWO-DIMENSIONAL CODE FORMAT COMMAND (Data Matrix) [ESC] XB

- |        |                                                                                                                                                                      |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format | ① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijj) (, Jkklmmnnn) (= ooo ----- ooo)<br>[LF] [NUL]                                                                  |
|        | ② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijj) (, Jkklmmnnn)<br>(; pp <sub>1</sub> , pp <sub>2</sub> , pp <sub>3</sub> , -----, pp <sub>20</sub> ) [LF] [NUL] |

- |      |                                                                                                                                                                                                                  |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | aa: Two-dimensional code number<br>00 to 31                                                                                                                                                                      |
|      | bbbb: X-coordinate of the print origin of the two-dimensional code<br>Fixed at 4 digits (in 0.1 mm units)                                                                                                        |
|      | cccc: Y-coordinate of the print origin of the two-dimensional code<br>4 or 5 digits (in 0.1 mm units)                                                                                                            |
|      | d: Type of two-dimensional code<br>Q: Data Matrix                                                                                                                                                                |
|      | ee: ECC type<br>00: ECC000<br>01: ECC050<br>04: ECC050<br>05: ECC050<br>06: ECC080<br>07: ECC080<br>08: ECC080<br>09: ECC100<br>10: ECC100<br>11: ECC140<br>12: ECC140<br>13: ECC140<br>14: ECC140<br>20: ECC200 |
|      | ff: 1-cell width<br>00 to 99 (in units of dots)                                                                                                                                                                  |
|      | gg: Format ID<br>01: Format ID 1<br>02: Format ID 2<br>03: Format ID 3<br>04: Format ID 4<br>05: Format ID 5<br>06: Format ID 6                                                                                  |

\* When ECC200 is designated as ECC type, the format ID designation is ignored. When format ID of 11 through 16 is designated, ECC200 is automatically selected (to ensure compatibility with the old model).

h: Rotational angle of two-dimensional code  
 0: 0°  
 1: 90°  
 2: 180°  
 3: 270°

Ciiiijjj: No. of cells  
 (Omissible. If omitted, it is automatically set.)

iii: No. of cells in the X direction 000 to 144

jjj: No. of cells in the Y direction 000 to 144

\* Cell setting varies according to the ECC type.

|                               | ECC000 to ECC140 | ECC200                                                       |
|-------------------------------|------------------|--------------------------------------------------------------|
| No. of cells to be designated | Odd numbers only | Even numbers only                                            |
| Min./Max. No. of cells        | 9 × 9 to 49 × 49 | 10 × 10 to 144 × 144                                         |
| Rectangular code              | None             | 18 × 8<br>32 × 8<br>26 × 12<br>36 × 12<br>36 × 16<br>48 × 16 |

\* When this parameter is omitted, the number of cells is automatically set. Also, when any data other than the above values are designated for the number of cells in the X and Y directions, the number of cells is automatically set.

Jkkllmmnnn: Connection setting  
 (Omissible. If omitted, connection is not made.)

kk: Code number 01 to 16

ll: No. of divided codes 02 to 16

mmm: ID number 1 001 to 254

nnn: ID number 2 001 to 254

ooo ----- ooo: Data string to be printed (Omissible)  
 Max. 2000 digits

pp<sub>1</sub>, pp<sub>2</sub>, pp<sub>3</sub>, -----, pp<sub>20</sub>: Link field No. (Omissible)  
 01 to 99 (1 to 99 can also be used.)  
 Up to 20 fields can be designated using commas.

\* The maximum of 2000 digits of data string to be printed and the maximum of 99 dots of the 1-cell width are acceptable. (The maximum number of digits of the data string to be printed differs depending on the ECC level and the contents of data.) However, note the following limits:

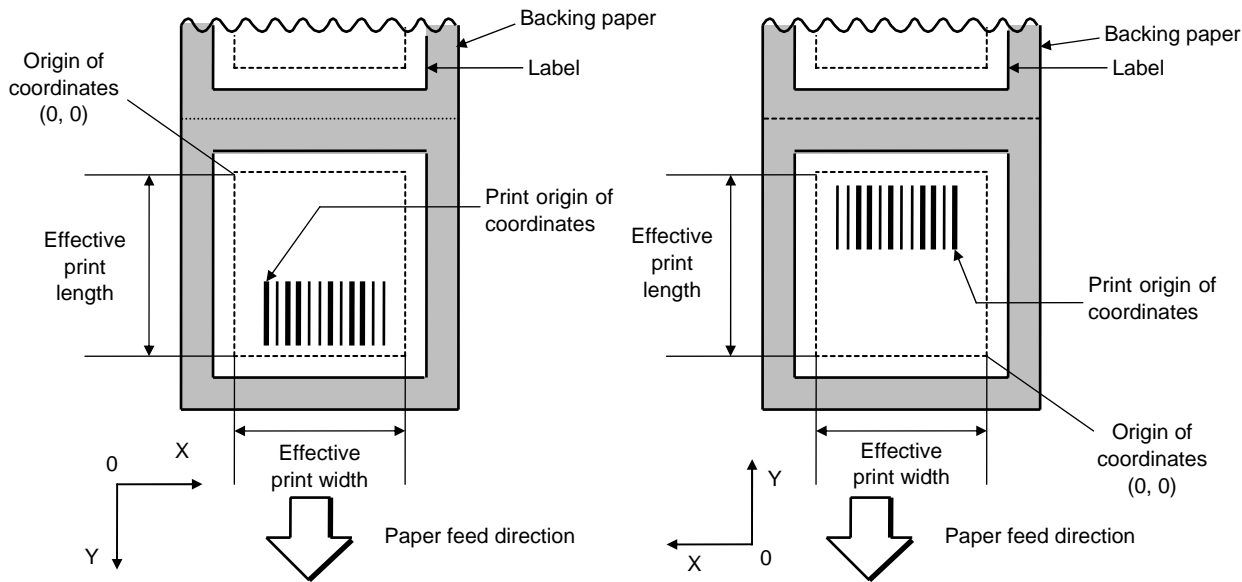
- The maximum of 2000-digit data string to be printed are acceptable. However, it cannot actually be printed, since it cannot be contained within the 2-inch head width.
- If the print ratio of one line (the print head width) is high, printing may become poor, or the printer may be reset. Be careful about the print ratio.
- When a large value is set for the 1-cell width, decrease the number of digits of data to contain the data within the head width.

Explanation

- (1) Two-dimensional code number

When drawing by the Data Command ([ESC] RB), the format designated by the two-dimensional code number is selected.

- (2) Print origin of coordinates



[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the two-dimensional code drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

- (3) Type of two-dimensional code

Q: Data Matrix

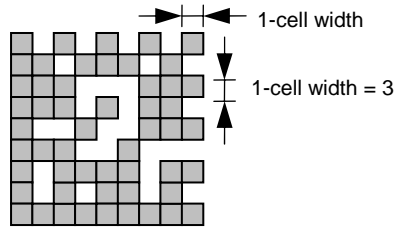


- (4) ECC type

Data Matrix contains a function to correct a code reading error using an error correction code (ECC) and restore normal data. The ECC should be chosen from several types of ECCs according to usage. The general correction ability is as follows. However, it may vary according to the error conditions.

| ECC type | Error Correction Ability                                                                                                                                                                        | Overhead by ECC |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| ECC000   | <div style="border: 1px solid black; padding: 5px; display: inline-block;">Low</div><br>$\updownarrow$<br><div style="border: 1px solid black; padding: 5px; display: inline-block;">High</div> | 0%              |
| ECC050   |                                                                                                                                                                                                 | 25%             |
| ECC080   |                                                                                                                                                                                                 | 33%             |
| ECC100   |                                                                                                                                                                                                 | 50%             |
| ECC140   |                                                                                                                                                                                                 | 75%             |
| ECC200   |                                                                                                                                                                                                 | Approx. 30%     |

(5) 1-cell width



When 1-cell width is set to 00 for the Data Matrix or CP code, a two-dimensional code is not drawn. However, the barcode printed on the previous label is cleared.

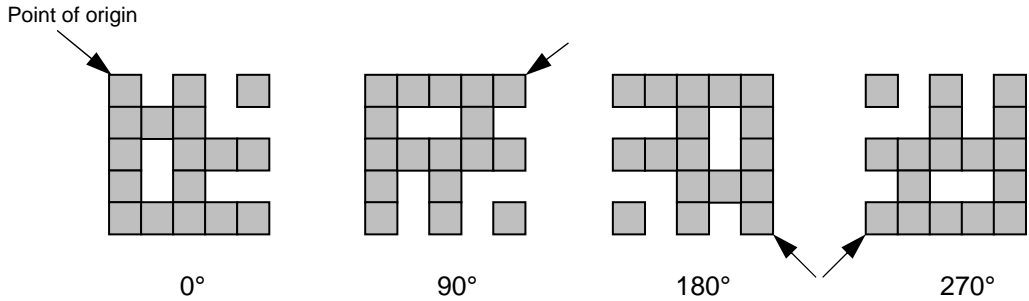
The maximum cell width is 99 dots. (However, the number of digits of data should be limited so the two-dimensional code can be printed within the 2-inch head width.)

(6) Format ID

Data Matrix can handle all codes including alphanumerics, symbols and Kanji. Since the data compression rate varies according to the code, a code to be used is designated using the format ID.

| Format ID | Code                   | Details                     |
|-----------|------------------------|-----------------------------|
| 1         | Numerics               | 0 to 9 space                |
| 2         | Letters                | A to Z space                |
| 3         | Alphanumerics, symbols | 0 to 9 A to Z space . , - / |
| 4         | Alphanumerics          | 0 to 9 A to Z space         |
| 5         | ASCII (7 bit)          | 00H to 7FH                  |
| 6         | ISO (8 bit)            | 00H to FFH (Kanji)          |

(7) Rotational angle of two-dimensional code



(8) Maximum number of digits

The maximum number of digits varies according to the ECC type or format ID.

Since a Kanji character uses 2 bytes, its maximum number of digits becomes half of the following values:

|             | ECC000 | ECC050 | ECC080 | ECC100 | ECC140 |
|-------------|--------|--------|--------|--------|--------|
| Format ID 1 | 500    | 457    | 402    | 300    | 144    |
| Format ID 2 | 452    | 333    | 293    | 218    | 105    |
| Format ID 3 | 394    | 291    | 256    | 190    | 91     |
| Format ID 4 | 413    | 305    | 268    | 200    | 96     |
| Format ID 5 | 310    | 228    | 201    | 150    | 72     |
| Format ID 6 | 271    | 200    | 176    | 131    | 63     |

|        | Numeric | Alphanumeric | 8 bit |
|--------|---------|--------------|-------|
| ECC200 | 2000    | 2000         | 1556  |

For the maximum number of digits in cell units, see the next page.

(9) Connection setting

The connection setting is used when the data cannot be expressed with a two-dimensional code. Data is comprised of more than one two-dimensional code. When three two-dimensional codes are used to comprise data, for example, identification information of 1/3, 2/3, and 3/3 is inserted into each two-dimensional code. The ID number is assigned to identify the proper combination of two-dimensional codes when plural connecting symbols are printed on one label. For example, when there are two kinds of data containing identification information for 1/2 and 2/2 in the same label, combination of two-dimensional codes is unclear. By adding the ID number, the combination is made clearer.

(10) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=” The maximum number of digits to be printed is 2000. (However, the number of digits of data should be limited so the two-dimensional code can be printed within the 2-inch head width.)

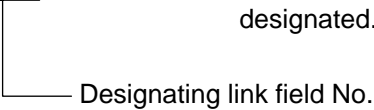
(11) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”  
 After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.  
 Up to 20 fields can be linked.  
 The following shows an example of linked fields on the two continuous labels.

[Format Command]

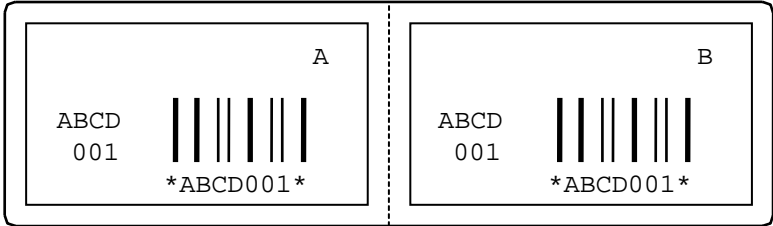
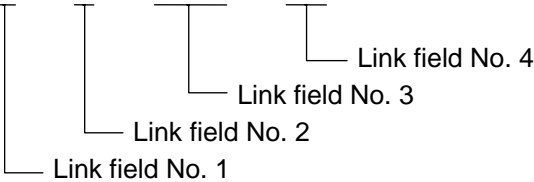
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.  
 [ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.  
 [ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.



[Data Command]

[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]



(12) Cell size and the effective data capacity

| Symbol size |     | ECC000           |                   |                     | ECC050           |                   |                     | ECC080           |                   |                     | ECC100           |                   |                     | ECC140           |                   |                     |
|-------------|-----|------------------|-------------------|---------------------|------------------|-------------------|---------------------|------------------|-------------------|---------------------|------------------|-------------------|---------------------|------------------|-------------------|---------------------|
|             |     | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity |
| Row         | Col |                  |                   |                     |                  |                   |                     |                  |                   |                     |                  |                   |                     |                  |                   |                     |
| 9           | 9   | 3                | 2                 | 1                   | —                | —                 | —                   | —                | —                 | —                   | —                | —                 | —                   | —                | —                 | —                   |
| 11          | 11  | 12               | 8                 | 5                   | 1                | 1                 | —                   | —                | —                 | —                   | —                | —                 | —                   | —                | —                 | —                   |
| 13          | 13  | 24               | 16                | 10                  | 10               | 6                 | 4                   | 4                | 3                 | 2                   | 1                | 1                 | —                   | —                | —                 | —                   |
| 15          | 15  | 37               | 25                | 16                  | 20               | 13                | 9                   | 13               | 9                 | 6                   | 8                | 5                 | 3                   | —                | —                 | —                   |
| 17          | 17  | 53               | 35                | 23                  | 32               | 21                | 14                  | 24               | 16                | 10                  | 16               | 11                | 7                   | 2                | 1                 | 1                   |
| 19          | 19  | 72               | 48                | 31                  | 46               | 30                | 20                  | 36               | 24                | 16                  | 25               | 17                | 11                  | 6                | 4                 | 3                   |
| 21          | 21  | 92               | 61                | 40                  | 61               | 41                | 27                  | 50               | 33                | 22                  | 36               | 24                | 15                  | 12               | 8                 | 5                   |
| 23          | 23  | 115              | 76                | 50                  | 78               | 52                | 34                  | 65               | 43                | 28                  | 47               | 31                | 20                  | 17               | 11                | 7                   |
| 25          | 25  | 140              | 93                | 61                  | 97               | 65                | 42                  | 82               | 54                | 36                  | 60               | 40                | 26                  | 24               | 16                | 10                  |
| 27          | 27  | 168              | 112               | 73                  | 118              | 78                | 51                  | 100              | 67                | 44                  | 73               | 49                | 32                  | 30               | 20                | 13                  |
| 29          | 29  | 197              | 131               | 86                  | 140              | 93                | 61                  | 120              | 80                | 52                  | 88               | 59                | 38                  | 38               | 25                | 16                  |
| 31          | 31  | 229              | 153               | 100                 | 164              | 109               | 72                  | 141              | 94                | 62                  | 104              | 69                | 45                  | 46               | 30                | 20                  |
| 33          | 33  | 264              | 176               | 115                 | 190              | 126               | 83                  | 164              | 109               | 72                  | 121              | 81                | 53                  | 54               | 36                | 24                  |
| 35          | 35  | 300              | 200               | 131                 | 217              | 145               | 95                  | 188              | 125               | 82                  | 140              | 93                | 61                  | 64               | 42                | 28                  |
| 37          | 37  | 339              | 226               | 148                 | 246              | 164               | 108                 | 214              | 143               | 94                  | 159              | 106               | 69                  | 73               | 49                | 32                  |
| 39          | 39  | 380              | 253               | 166                 | 277              | 185               | 121                 | 242              | 161               | 106                 | 180              | 120               | 78                  | 84               | 56                | 36                  |
| 41          | 41  | 424              | 282               | 185                 | 310              | 206               | 135                 | 270              | 180               | 118                 | 201              | 134               | 88                  | 94               | 63                | 41                  |
| 43          | 43  | 469              | 313               | 205                 | 344              | 229               | 150                 | 301              | 201               | 132                 | 224              | 149               | 98                  | 106              | 70                | 46                  |
| 45          | 45  | 500              | 345               | 226                 | 380              | 253               | 166                 | 333              | 222               | 146                 | 248              | 165               | 108                 | 118              | 78                | 51                  |
| 47          | 47  | 500              | 378               | 248                 | 418              | 278               | 183                 | 366              | 244               | 160                 | 273              | 182               | 119                 | 130              | 87                | 57                  |
| 49          | 49  | 500              | 413               | 271                 | 457              | 305               | 200                 | 402              | 268               | 176                 | 300              | 200               | 131                 | 144              | 96                | 63                  |

| Symbol size |     | ECC200           |                   |                     |
|-------------|-----|------------------|-------------------|---------------------|
|             |     | Numeric capacity | Alphanum capacity | 8-bit byte capacity |
| Row         | Col |                  |                   |                     |
| 10          | 10  | 6                | 3                 | 1                   |
| 12          | 12  | 10               | 6                 | 3                   |
| 14          | 14  | 16               | 10                | 6                   |
| 16          | 16  | 24               | 16                | 10                  |
| 18          | 18  | 36               | 25                | 16                  |
| 20          | 20  | 44               | 31                | 20                  |
| 22          | 22  | 60               | 43                | 28                  |
| 24          | 24  | 72               | 52                | 34                  |
| 26          | 26  | 88               | 64                | 42                  |
| 32          | 32  | 124              | 91                | 60                  |
| 36          | 36  | 172              | 127               | 84                  |
| 40          | 40  | 228              | 169               | 112                 |
| 44          | 44  | 288              | 214               | 142                 |
| 48          | 48  | 348              | 259               | 172                 |
| 52          | 52  | 408              | 304               | 202                 |
| 64          | 64  | 560              | 418               | 278                 |
| 72          | 72  | 736              | 550               | 366                 |
| 80          | 80  | 912              | 682               | 454                 |
| 88          | 88  | 1152             | 862               | 574                 |
| 96          | 96  | 1392             | 1042              | 694                 |
| 104         | 104 | 1632             | 1222              | 814                 |
| 120         | 120 | 2000             | 1573              | 1048                |
| 132         | 132 | 2000             | 1954              | 1302                |
| 144         | 144 | 2000             | 2000              | 1556                |

Rectangular code

| Symbol size |     | ECC200           |                   |                     |
|-------------|-----|------------------|-------------------|---------------------|
|             |     | Numeric capacity | Alphanum capacity | 8-bit byte capacity |
| Row         | Col |                  |                   |                     |
| 8           | 18  | 10               | 6                 | 3                   |
| 8           | 32  | 20               | 13                | 8                   |
| 12          | 26  | 32               | 22                | 14                  |
| 12          | 36  | 44               | 31                | 20                  |
| 16          | 36  | 64               | 46                | 30                  |
| 16          | 48  | 98               | 72                | 47                  |



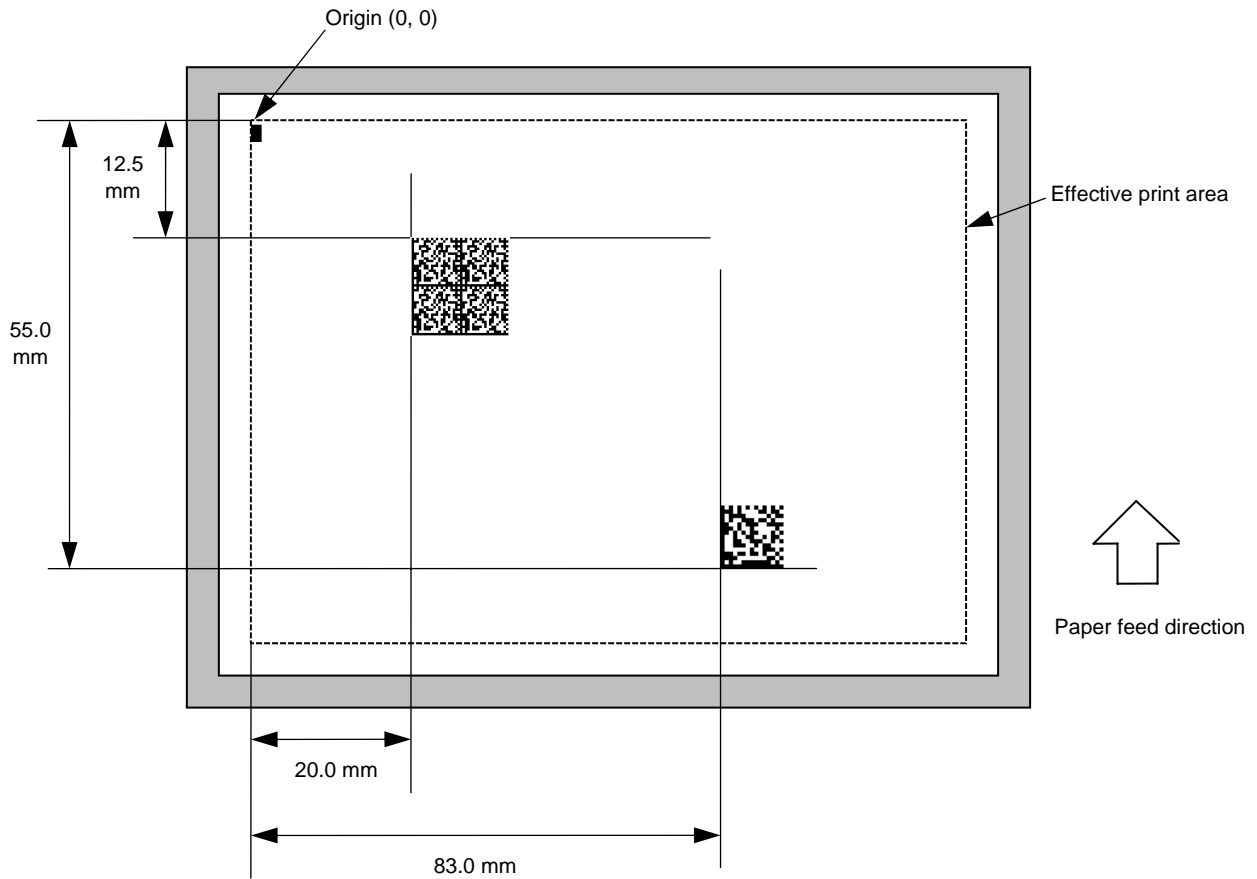
Notes

- (1) More than one Two-dimensional Code Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (2) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the two-dimensional code number, then the next drawing data is printed. Therefore, the two-dimensional code number which differs according to the drawing fields should be designated.
- (3) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same two-dimensional code number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same two-dimensional code number are automatically cleared until the Clear Command is sent.)
- (4) The link field designation is cleared by omitting the link field designation using the same two-dimensional code No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (5) A print data string and link field No. cannot be programmed at the same time.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)

Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, Q, 20, 05, 01, 0 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; Toshiba TEC [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

**5.6.8 TWO-DIMENSIONAL CODE FORMAT COMMAND (PDF417) [ESC] XB**

- Format**
- ① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iij (= jjj ----- jjj) [LF] [NUL]
  - ② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iii (; kk<sub>1</sub>, kk<sub>2</sub>, kk<sub>3</sub>, -----, kk<sub>20</sub>) [LF] [NUL]

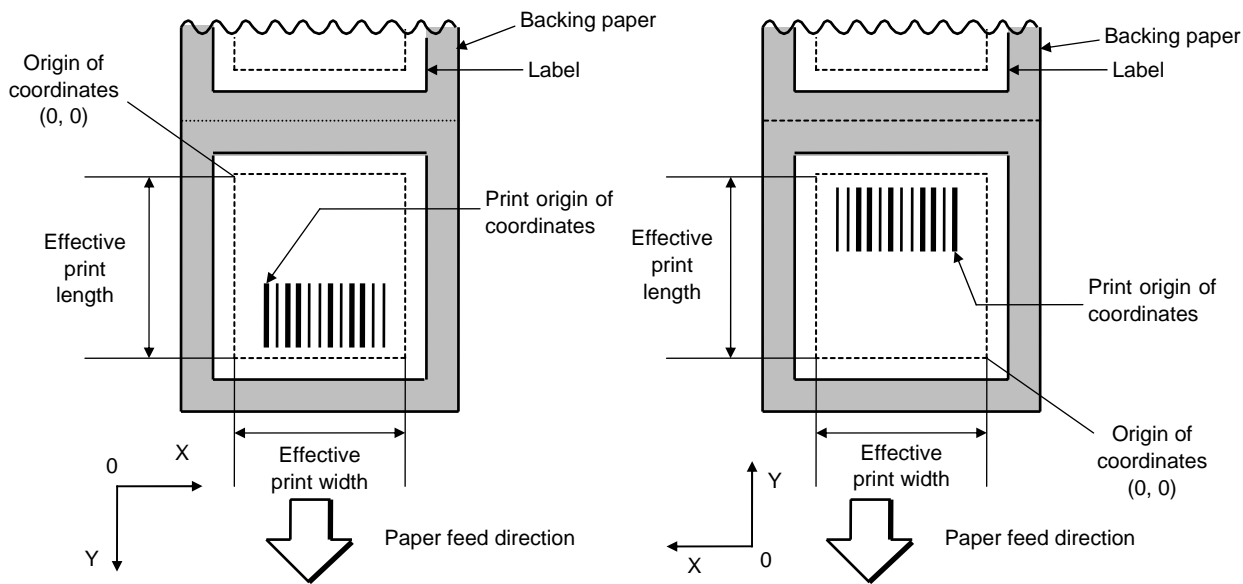
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Term</b> | <p>aa: Two-dimensional code number<br/>00 to 31</p> <p>bbbb: X-coordinate of the print origin of the two-dimensional code<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of the two-dimensional code<br/>4 or 5 digits (in 0.1 mm units)</p> <p>d: Type of two-dimensional code<br/>P: PDF417</p> <p>ee: Security level<br/>00: Level 0<br/>01: Level 1<br/>02: Level 2<br/>03: Level 3<br/>04: Level 4<br/>05: Level 5<br/>06: Level 6<br/>07: Level 7<br/>08: Level 8</p> <p>ff: 1-module width<br/>01 to 10 (in units of dots)</p> <p>gg: No. of columns/rows<br/>01 to 30</p> <p>h: Rotational angle of two-dimensional code<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>iii: Bar height<br/>0000 to 0100 (in 0.1 mm units)</p> <p>jjj-----jjj: Data string to be printed (Omissible)<br/>Max. 2,000 digits</p> <p>kk<sub>1</sub>, kk<sub>2</sub>, kk<sub>3</sub>, -----, kk<sub>20</sub>: Link field No. (Omissible)<br/>01 to 99 (1 to 99 can also be used.)<br/>Up to 20 fields can be designated using commas.</p> |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Explanation

(1) Two-dimensional code number

When drawing by the Data Command ([ESC] RB), the format designated by the two-dimensional code number is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the two-dimensional code drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

(3) Type of two-dimensional code

P: PDF417



(4) Security level

The PDF417 contains a function to correct a code reading error using an error correcting code word and restore normal data. The security level should be designated according to usage.

| Security level | Error Correction Ability                                                                                                                                                                                                                                                                                                    | No. of error correction code words |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Level 0        | <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Low</div> <div style="margin: 0 5px;">↑</div> <div style="margin: 0 5px;">↓</div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">High</div> </div> | 0                                  |
| Level 1        |                                                                                                                                                                                                                                                                                                                             | 2                                  |
| Level 2        |                                                                                                                                                                                                                                                                                                                             | 6                                  |
| Level 3        |                                                                                                                                                                                                                                                                                                                             | 14                                 |
| Level 4        |                                                                                                                                                                                                                                                                                                                             | 30                                 |
| Level 5        |                                                                                                                                                                                                                                                                                                                             | 62                                 |
| Level 6        |                                                                                                                                                                                                                                                                                                                             | 126                                |
| Level 7        |                                                                                                                                                                                                                                                                                                                             | 254                                |
| Level 8        |                                                                                                                                                                                                                                                                                                                             | 510                                |

(5) 1-module width

The width of 2 to 6 modules is automatically calculated by designating a 1-module width.

[Example of setting]

203-dpi print head (1 dot = 1/8 mm)

| Type of barcode | 1 module |       | 2 modules |       | 3 modules |       | 4 modules |       | 5 modules |       | 6 modules |       |
|-----------------|----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
|                 | Bar      | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space |
| PDF417          |          | 2     |           | 4     |           | 6     |           | 8     |           | 10    |           | 12    |

Values to be set in ff: "1-module width"

To be automatically calculated based on the value set in ff: "1-module width"

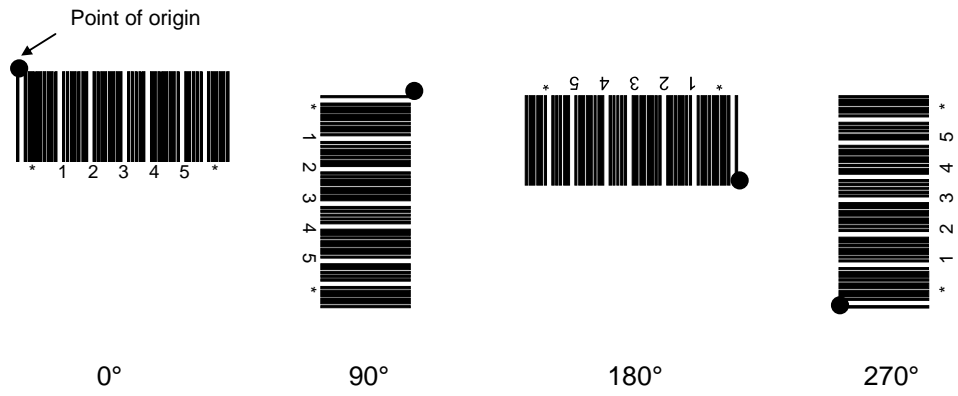
(6) No. of columns/rows

The number of rows and the row length (No. of data strings) are variable. Therefore, the form of the symbol can be changed in the proportion of the height and width in accordance with the paper to be used.

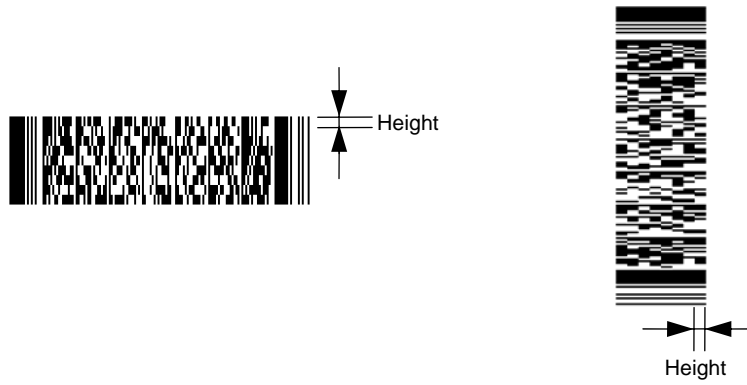
The number of columns (the number of data strings) is varied between 1 and 30.

If the number of columns is set to too small though the data volume is large and the security level is high, drawing may not be performed. This is because the number of rows may exceed 90 when the number of columns is too small. (The number of rows of symbols is limited in a range from 3 to 90.)

(7) Rotational angle of two-dimensional code



(8) Height of two-dimensional code



(9) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=”.” The maximum number of digits to be printed is 2000. (However, the number of digits of data should be limited so the two-dimensional code can be printed within the 2-inch head width.)

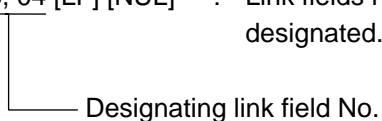
(10) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”  
After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.  
Up to 20 fields can be linked.  
The following shows an example of linked fields on the two continuous labels.

[Format Command]

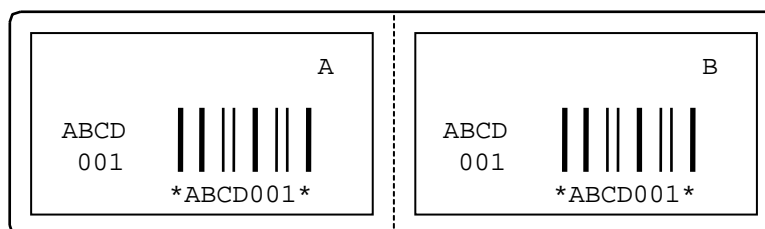
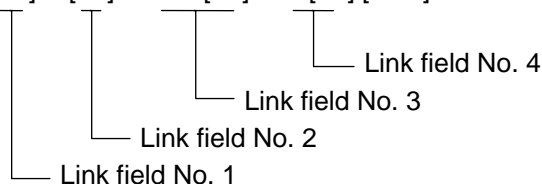
```
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.
[ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.

[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.
[ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.
```



[Data Command]

```
[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]
```



Notes

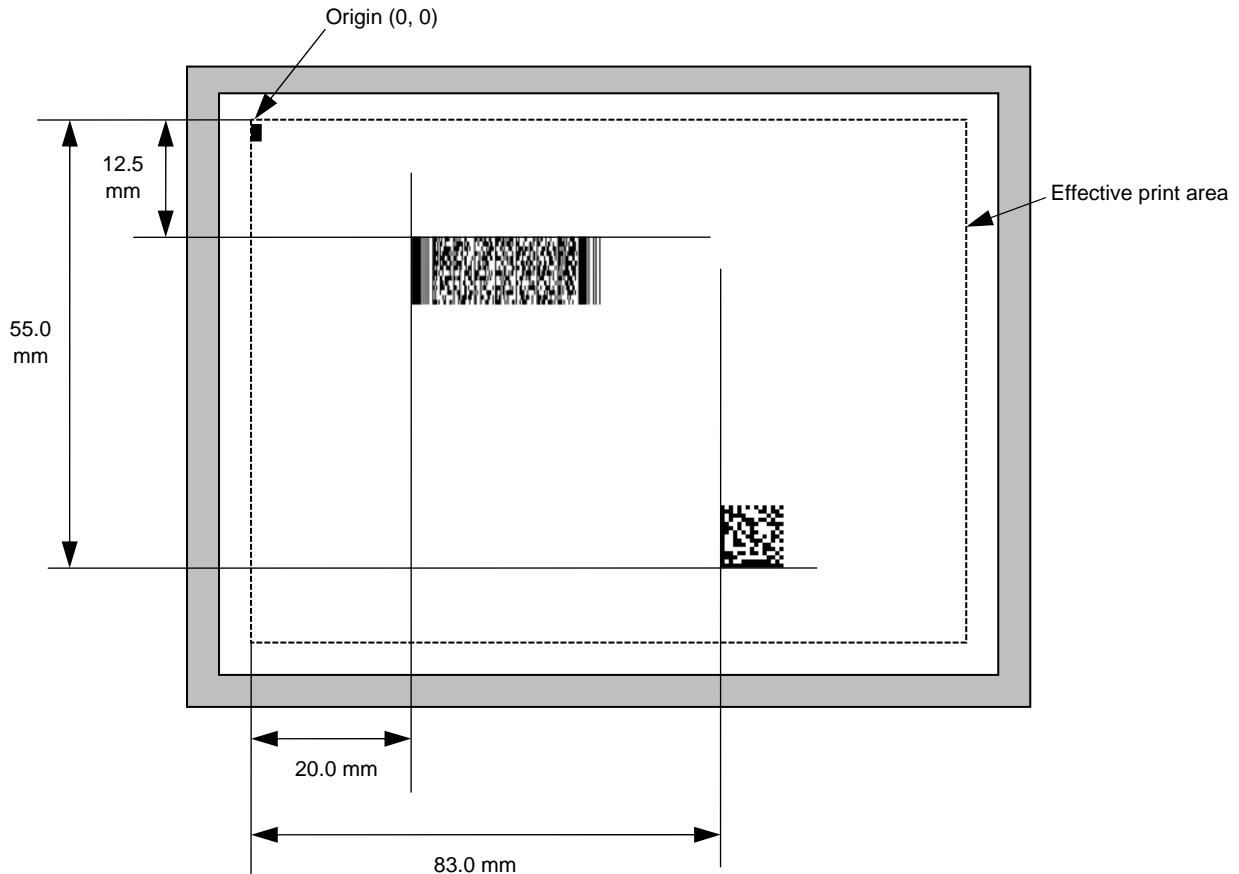
- (1) More than one Two-dimensional Code Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (2) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the two-dimensional code number, then the next drawing data is printed. Therefore, the two-dimensional code number which differs according to the drawing fields should be designated.
- (3) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same two-dimensional code number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same two-dimensional code number are automatically cleared until the Clear Command is sent.)
- (4) The link field designation is cleared by omitting the link field designation using the same two-dimensional code No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (5) A print data string and link field No. cannot be programmed at the same time.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)



Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, P, 04, 02, 03, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; PDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

### 5.6.9 TWO-DIMENSIONAL CODE FORMAT COMMAND (MicroPDF417)[ESC] XB

- Format**
- ① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiiii (= jjj ----- jjj) [LF] [NUL]
- ② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiiii (; kk<sub>1</sub>, kk<sub>2</sub>, kk<sub>3</sub>, ----- , kk<sub>20</sub>) [LF] [NUL]

| Term         |                                                                                                     |
|--------------|-----------------------------------------------------------------------------------------------------|
| aa:          | Two-dimensional code number<br>00 to 31                                                             |
| bbbb:        | X-coordinate of the print origin of the two-dimensional code<br>Fixed at 4 digits (in 0.1 mm units) |
| cccc:        | Y-coordinate of the print origin of the two-dimensional code<br>4 or 5 digits (in 0.1 mm units)     |
| d:           | Type of two-dimensional code<br>X: MicroPDF417                                                      |
| ee:          | Security level<br>00: Fixed                                                                         |
| ff:          | 1-module width<br>01 to 10 (in units of dots)                                                       |
| gg:          | No. of columns/rows<br>00 to 38                                                                     |
| h:           | Rotational angle of two-dimensional code<br>0: 0°<br>1: 90°<br>2: 180°<br>3: 270°                   |
| iiii:        | Bar height<br>0000 to 0100 (in 0.1 mm units)                                                        |
| jjj-----jjj: | Data string to be printed (Omissible)<br>Max. 366 digits                                            |

\* The maximum of 366 digits of data string to be printed are acceptable. (The maximum number of digits of the data string to be printed differs depending on the numbers of columns, the number of rows, and the contents of data.) However, note the following limits:

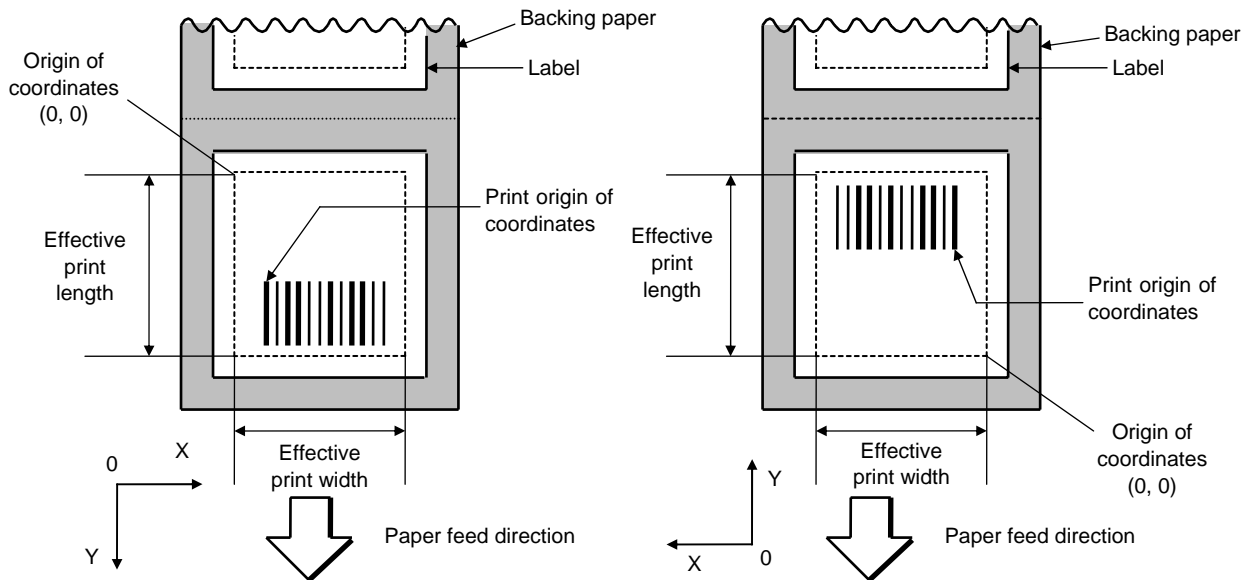
- The maximum of 366-digit data string to be printed are acceptable. However, it cannot actually be printed, since it cannot be contained within the 2-inch head width.
- If the print ratio of one line (the print head width) is high, printing may become poor, or the printer may be reset. Be careful about the print ratio.

Explanation

(1) Two-dimensional code number

When drawing by the Data Command ([ESC] RB), the format designated by the two-dimensional code number is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the two-dimensional code drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

(3) Type of two-dimensional code

X: MicroPDF417



(4) Security level

The MicroPDF417 contains a function to correct a code reading error using an error correcting code word and restore normal data. The printer automatically sets the security level.

(5) 1-module width

The width of 2 to 6 modules is automatically calculated by designating a 1-module width.

[Example of setting]

203-dpi print head (1 dot = 1/8 mm)

| Type of barcode | 1 module |       | 2 modules |       | 3 modules |       | 4 modules |       | 5 modules |       | 6 modules |       |
|-----------------|----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
|                 | Bar      | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space |
| MicroPDF417     |          | 2     |           | 4     |           | 6     |           | 8     |           | 10    |           | 12    |

Values to be set in ff: "1-module width"

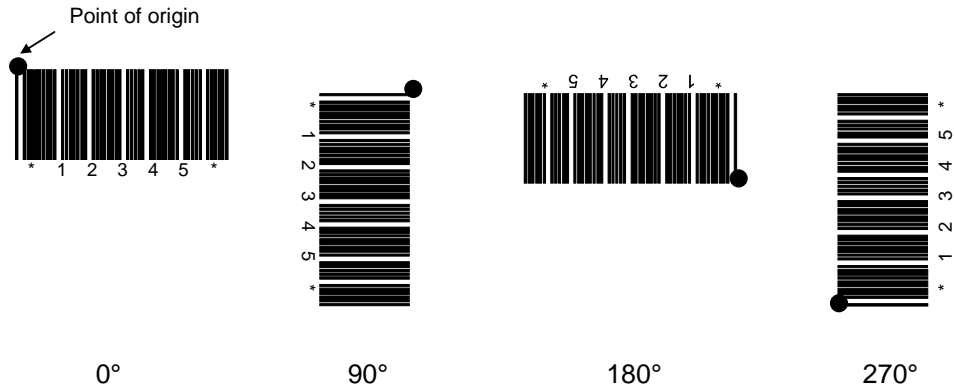
To be automatically calculated based on the value set in ff: "1-module width"

(6) No. of columns/rows

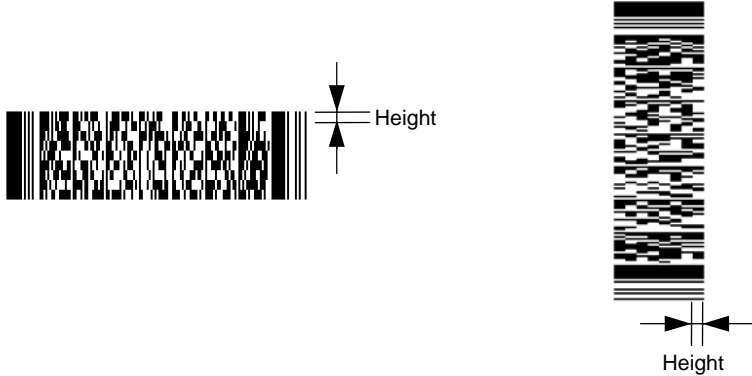
For the MicroPDF417, not only the number of columns (data strings) but also the number of rows (data lines) can be designated. When these are to be designated, see the table. Note that the max. number of digits for the set parameter (gg) varies according to the character type. If data over the max. number of digits for the set parameter (gg) is set, the two-dimensional code is not printed. The number of columns (data strings) is varied in a range from 1 to 4.

Though the max. number of lines is 44, it depends on the number of columns.

(7) Rotational angle of two-dimensional code



(8) Height of two-dimensional code



(9) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=” The maximum number of digits to be printed is 366. (However, the number of digits of data should be limited so the two-dimensional code can be printed within the 2-inch head width.)

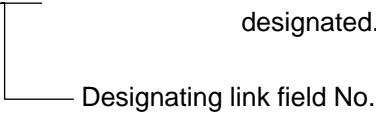
(10) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”  
 After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.  
 Up to 20 fields can be linked.  
 The following shows an example of linked fields on the two continuous labels.

[Format Command]

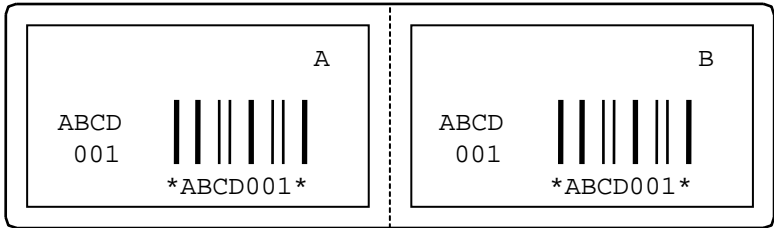
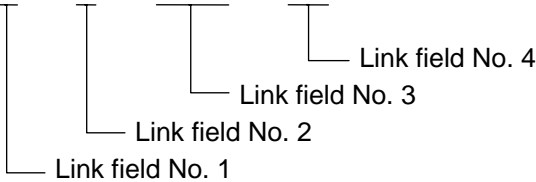
```
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.
[ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.

[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.
[ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.
```



[Data Command]

```
[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]
```



(11) The maximum number of columns and rows

| Parameter (gg) | No. of columns | No. of rows | Max. number of digits for binary mode | Max. number of digits for upper case letter/space mode | Max. number of digits for numeric mode |
|----------------|----------------|-------------|---------------------------------------|--------------------------------------------------------|----------------------------------------|
| 00             | –              | –           | 150                                   | 250                                                    | 366                                    |
| 01             | 1              | –           | 22                                    | 38                                                     | 55                                     |
| 02             | 2              | –           | 43                                    | 72                                                     | 105                                    |
| 03             | 3              | –           | 97                                    | 162                                                    | 237                                    |
| 04             | 4              | –           | 150                                   | 250                                                    | 366                                    |
| 05             | 1              | 11          | 3                                     | 6                                                      | 8                                      |
| 06             |                | 14          | 7                                     | 12                                                     | 17                                     |
| 07             |                | 17          | 10                                    | 18                                                     | 26                                     |
| 08             |                | 20          | 13                                    | 22                                                     | 32                                     |
| 09             |                | 24          | 18                                    | 30                                                     | 44                                     |
| 10             |                | 28          | 22                                    | 38                                                     | 55                                     |
| 11             | 2              | 8           | 8                                     | 14                                                     | 20                                     |
| 12             |                | 11          | 14                                    | 24                                                     | 35                                     |
| 13             |                | 14          | 21                                    | 36                                                     | 52                                     |
| 14             |                | 17          | 27                                    | 46                                                     | 67                                     |
| 15             |                | 20          | 33                                    | 56                                                     | 82                                     |
| 16             |                | 23          | 38                                    | 64                                                     | 93                                     |
| 17             | 26             | 43          | 72                                    | 105                                                    |                                        |
| 18             | 3              | 6           | 6                                     | 10                                                     | 14                                     |
| 19             |                | 8           | 10                                    | 18                                                     | 26                                     |
| 20             |                | 10          | 15                                    | 26                                                     | 38                                     |
| 21             |                | 12          | 20                                    | 34                                                     | 49                                     |
| 22             |                | 15          | 27                                    | 46                                                     | 67                                     |
| 23             |                | 20          | 39                                    | 66                                                     | 96                                     |
| 24             |                | 26          | 54                                    | 90                                                     | 132                                    |
| 25             |                | 32          | 68                                    | 114                                                    | 167                                    |
| 26             |                | 38          | 82                                    | 138                                                    | 202                                    |
| 27             |                | 44          | 97                                    | 162                                                    | 237                                    |
| 28             | 4              | 4           | 8                                     | 14                                                     | 20                                     |
| 29             |                | 6           | 13                                    | 22                                                     | 32                                     |
| 30             |                | 8           | 20                                    | 34                                                     | 49                                     |
| 31             |                | 10          | 27                                    | 46                                                     | 67                                     |
| 32             |                | 12          | 34                                    | 58                                                     | 85                                     |
| 33             |                | 15          | 45                                    | 76                                                     | 111                                    |
| 34             |                | 20          | 63                                    | 106                                                    | 155                                    |
| 35             |                | 26          | 85                                    | 142                                                    | 208                                    |
| 36             |                | 32          | 106                                   | 178                                                    | 261                                    |
| 37             |                | 38          | 128                                   | 214                                                    | 313                                    |
| 38             |                | 44          | 150                                   | 250                                                    | 366                                    |

“–” for parameter 00 to 04 indicates the numbers of columns/rows which are automatically set by the printer. In this case, the pattern which has a smaller number of code words is automatically selected. When the numbers of code words is equal, the smaller number of columns is selected.

Notes

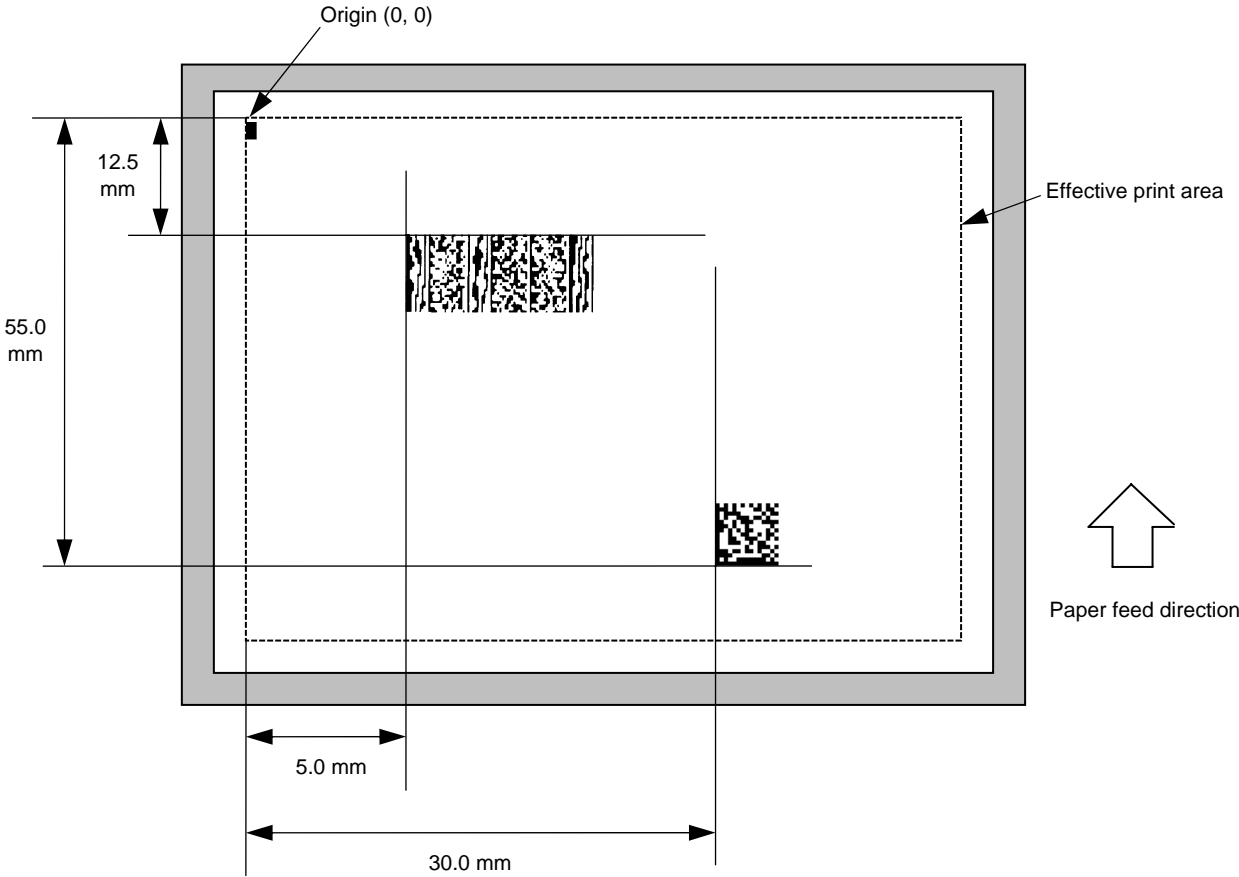
- (1) More than one Two-dimensional Code Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (2) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the two-dimensional code number, then the next drawing data is printed. Therefore, the two-dimensional code number which differs according to the drawing fields should be designated.
- (3) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same two-dimensional code number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same two-dimensional code number are automatically cleared until the Clear Command is sent.)
- (4) The link field designation is cleared by omitting the link field designation using the same two-dimensional code No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (5) A print data string and link field No. cannot be programmed at the same time.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)



Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, X, 00, 02, 00, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; MicroPDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

### 5.6.10 TWO-DIMENSIONAL CODE FORMAT COMMAND (QR Code) [ESC] XB

- |        |                                                                                                                                                                 |
|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Format | ① [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkklmm) (= nnn --- nnn) [LF] [NUL]                                                                    |
|        | ② [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkklmm) (; oo <sub>1</sub> , oo <sub>2</sub> , oo <sub>3</sub> , -----, oo <sub>20</sub> ) [LF] [NUL] |

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | <p>aa: Two-dimensional code number<br/>00 to 31</p> <p>bbbb: X-coordinate of the print origin of the two-dimensional code<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of the two-dimensional code<br/>4 or 5 digits (in 0.1 mm units)</p> <p>d: Type of two-dimensional code<br/>T: QR code</p> <p>e: Designation of error correction level<br/>L: High density level<br/>M: Standard level<br/>Q: Reliability level<br/>H: High reliability level</p> <p>ff: 1-cell width<br/>00 to 52 (in units of dots)</p> <p>g: Selection of mode<br/>M: Manual mode<br/>A: Automatic mode</p> <p>h: Rotational angle of two-dimensional code<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>Mi: Selection of model<br/>(Omissible. If omitted, Model 1 is automatically selected.)<br/>i = 1: Model 1<br/>2: Model 2</p> <p>Kj: Mask number<br/>(Omissible. If omitted, the number is automatically set.)<br/>j = 0 to 7: Mask number 0 to 7<br/>8: No mask</p> <p>Jkklmm: Connection setting<br/>(Omissible. If omitted, connection is not made.)<br/>kk = 01 to 16: Value indicating which divided code is connected.<br/>ll = 01 to 16: Number of divided codes<br/>mm = 00 to FF: A value for all print data (before divided) which have been XORed in units of bytes.</p> |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

nnn --- nnn: Data string to be printed (Omissible)  
Max. 2000 digits

oo<sub>1</sub> --- oo<sub>20</sub>: Link field No. (Omissible)  
01 to 99 (1 to 99 can also be used.)  
Up to 20 digits can be designated using commas.

\* The maximum of 2000 digits of data string to be printed and the maximum of 52 dots of the 1-cell width are acceptable. (The maximum number of digits of the data string to be printed differs depending on the error correction level and the contents of data.) However, note the following limits:

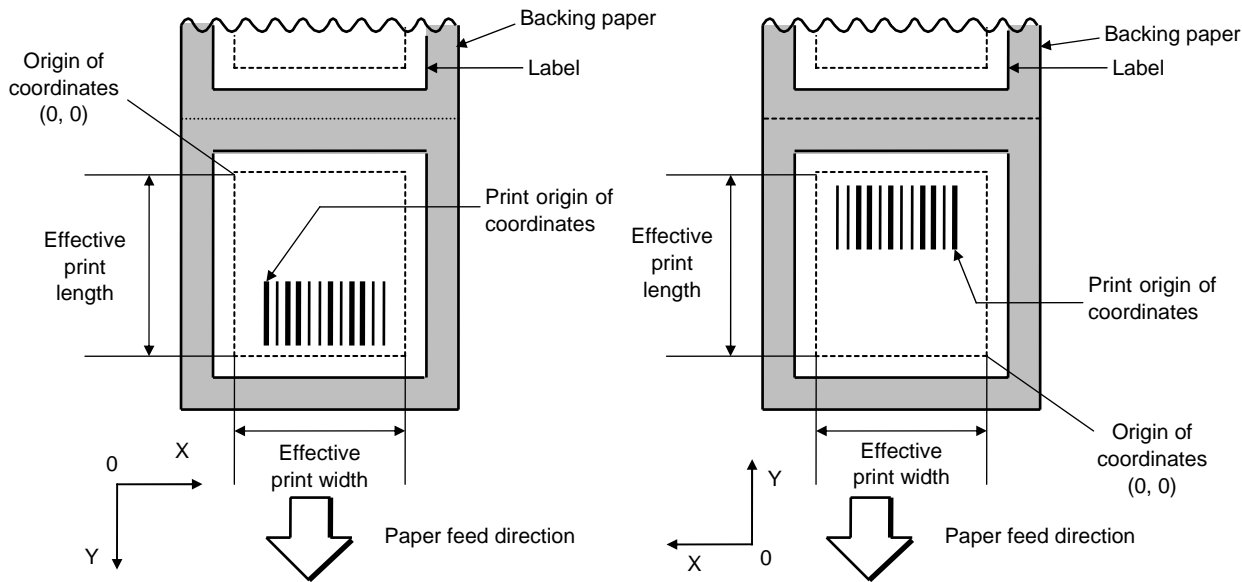
- The maximum of 2000-digit data string to be printed are acceptable. However, it cannot actually be printed, since it cannot be contained within the head width.
- If the print ratio of one line (the print head width) is high, printing may become poor, or the printer may be reset. Be careful about the print ratio.
- When a large value is set for the 1-cell width, decrease the number of digits of data to contain the data within the head width.

Explanation

(1) Two-dimensional code number

When drawing by the Data Command ([ESC] RB), the format designated by the two-dimensional code number is selected.

(2) Print origin of coordinates



[Printing direction: Bottom first]

[Printing direction: Top first]

The print origin of coordinates must be set so that the two-dimensional code drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

(3) Type of two-dimensional code

T: QR code



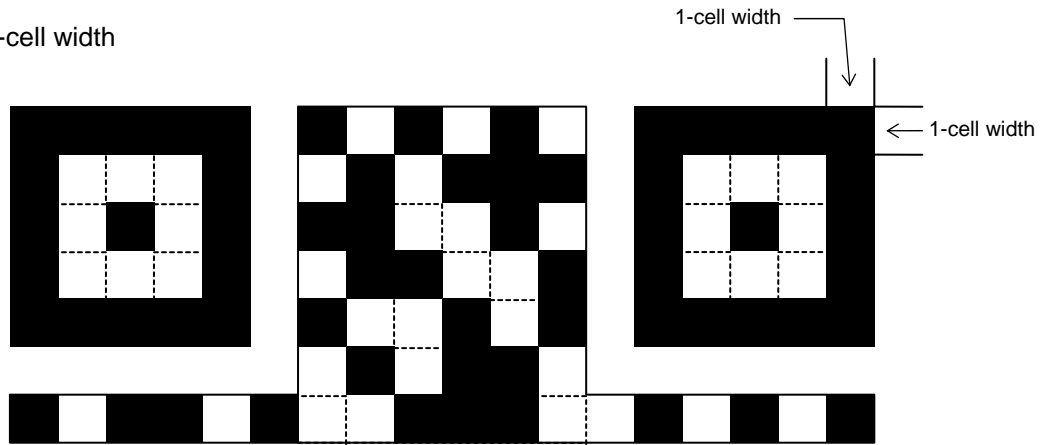
(4) Error correction level

The QR code contains functions to detect and correct an error. If one of the data characters is damaged, the information can be restored when this code is read.

There are 4 levels that can be designated. The level should be specified according to usage. The general correction ability is as follows.

| Level                  | Error correction ability | Overhead by correcting an error |
|------------------------|--------------------------|---------------------------------|
| High density level     | Low<br>↑↓<br>High        | 7%                              |
| Standard level         |                          | 15%                             |
| Reliability level      |                          | 25%                             |
| High reliability level |                          | 30%                             |

(5) 1-cell width

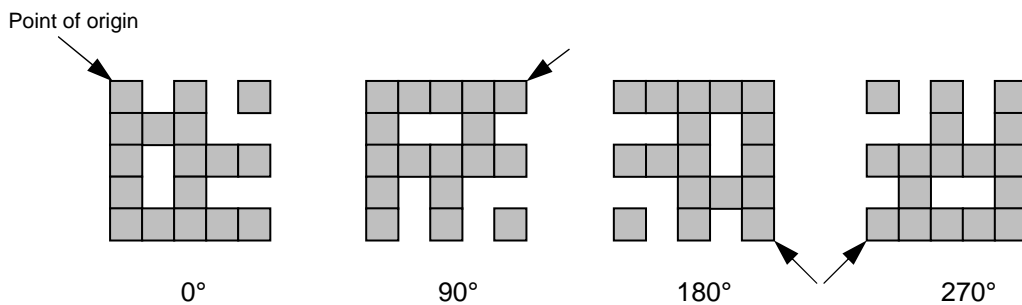


When the 1-cell width is set to 0 for the QR code, a two-dimensional code is not drawn. However, the barcode printed on the previous label is cleared.

(6) Selection of mode

All codes including alphanumerals, symbols and Kanji can be used in one QR code. Manual mode or automatic mode can be selected to perform the operation.

(7) Rotational angle of two-dimensional code



(8) Selection of model

- Model 1: Original specification
- Model 2: Extended specification which enhances the function of position correction and can contain a large amount of data.

(9) Mask number

It is preferable that the black and white modules are arranged in well-balanced manner so that a QR code is read for sure. The mask number prevents the bit pattern "1011101," which is characteristically seen in the position detecting pattern, from appearing in the symbol as much as possible.

The mask number is ranging from 0 to 7. The pattern of the code is determined by placing each masking pattern for the mask number over the module pattern. When the mask number is set to 8, masking is not performed. When the parameter is omitted, the most appropriate mask number is automatically selected to perform masking.

(10) Connection setting

For QR code, data can be divided into several codes. Even though the print space is limited, divided codes can be printed there. The data can be divided into a max. of 16 codes. Parity data is obtained by XORing all input data in units of bytes before dividing. The input data is calculated based on shift JIS for Kanji, or on JIS 8 for others. Examples are shown below:

“0123456789日本 ” is divided into “0123,” “4567” and “89日本 .”

|            |                         |                 |              |
|------------|-------------------------|-----------------|--------------|
| Code No. 1 | No. of divided codes: 3 | Parity data: 85 | Data “0123”  |
| Code No. 2 | No. of divided codes: 3 | Parity data: 85 | Data “4567”  |
| Code No. 3 | No. of divided codes: 3 | Parity data: 85 | Data “89日本 ” |

\* The parity data is the XORed value for “0123456789日本 ”.

30 31 32 33 34 35 36 37 38 39 93 FA 96 7B = 85

(11) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=” The maximum number of digits to be printed is 2000. (However, the number of digits of data should be limited so the two-dimensional code can be printed within the 2-inch head width.)

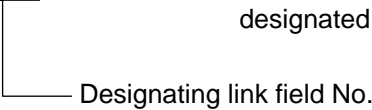
(12) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”  
 After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.  
 Up to 20 fields can be linked.  
 The following shows an example of linked fields on the two continuous labels.

[Format Command]

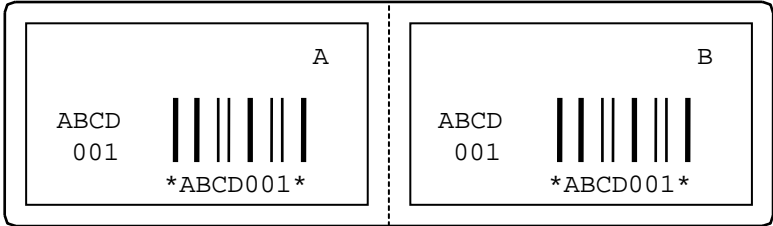
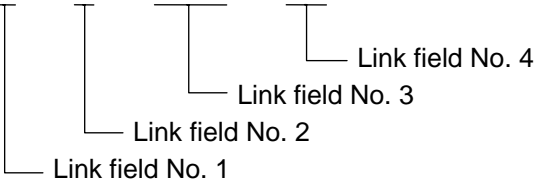
```
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.
[ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.

[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.
[ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are
 designated.
```



[Data Command]

```
[ESC] RB; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]
```



Notes

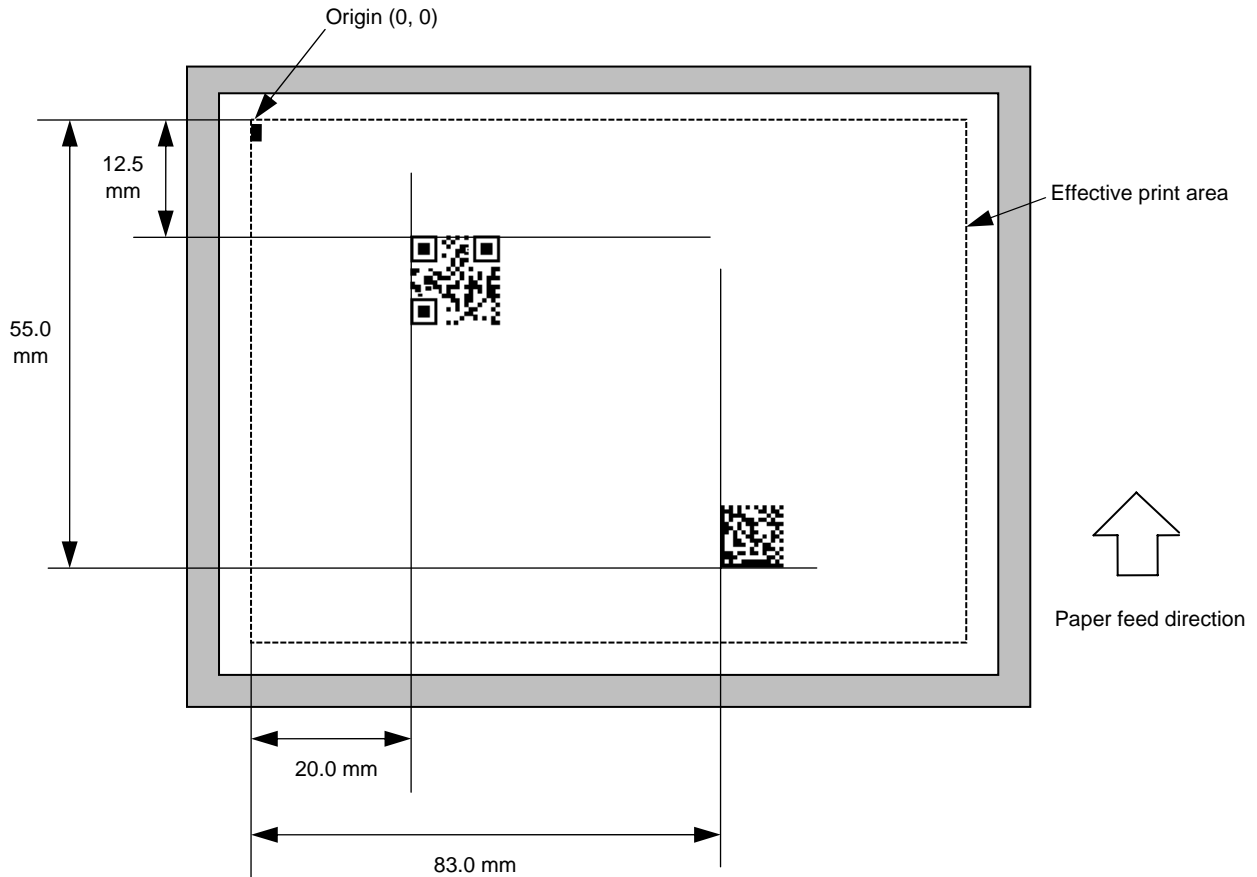
- (1) More than one Two-dimensional Code Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (2) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the two-dimensional code number, then the next drawing data is printed. Therefore, the two-dimensional code number which differs according to the drawing fields should be designated.
- (3) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same two-dimensional code number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same two-dimensional code number are automatically cleared until the Clear Command is sent.)
- (4) The link field designation is cleared by omitting the link field designation using the same two-dimensional code No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (5) A print data string and link field No. cannot be programmed at the same time.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)



Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, T, M, 02, A, 0 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; QR Code [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

### 5.6.11 TWO-DIMENSIONAL CODE FORMAT COMMAND (MaxiCode) [ESC] XB

- Format**
- ① [ESC] XBaa; bbbb, cccc, d (, e) (, Jffgg) (, Zh) (= mmm ----- mmm) [LF] [NUL]
- ② [ESC] XBaa; bbbb, cccc, d (, e) (, Jffgg) (, Zh) (; nn<sub>1</sub>, nn<sub>2</sub>, nn<sub>3</sub>, -----, nn<sub>20</sub>) [LF] [NUL]

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Term</b> | <p>aa: Two-dimensional code number<br/>00 to 31</p> <p>bbbb: X-coordinate of the print origin of the two-dimensional code<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Y-coordinate of the print origin of the two-dimensional code<br/>4 or 5 digits (in 0.1 mm units)</p> <p>d: Type of two-dimensional code<br/>Z: MaxiCode</p> <p>e: Mode selection (Omissible)</p> <ul style="list-style-type: none"> <li>• When the MaxiCode specification is set to "TYPE1: Compatible with the current version" in the SYSTEM mode. <ul style="list-style-type: none"> <li>Omitted: Mode 2</li> <li>0: Mode 2</li> <li>1: Mode 4</li> <li>2: Mode 2</li> <li>3: Mode 3</li> <li>4: Mode 4</li> <li>5: Mode 2</li> <li>6: Mode 6</li> <li>7: Mode 2</li> <li>8: Mode 2</li> <li>9: Mode 2</li> </ul> </li> <li>• When the MaxiCode specification is set to "TYPE2: Special specification" in the SYSTEM mode. <ul style="list-style-type: none"> <li>Omitted: Mode 2 or Mode 3(*)</li> <li>0: Mode 2 or Mode 3(*)</li> <li>1: Mode 4</li> <li>2: Mode 2</li> <li>3: Mode 3</li> <li>4: Mode 4</li> <li>5: Mode 2 or Mode 3 (*)</li> <li>6: Mode 6</li> <li>7: Mode 2 or Mode 3 (*)</li> <li>8: Mode 2 or Mode 3 (*)</li> <li>9: Mode 2 or Mode 3 (*)</li> </ul> </li> </ul> <p>*: Mode 2 or Mode 3 should be determined depending on the country code of the data command. When the country code is 840, Mode 2 should be selected. For other codes than 840, Mode 3 should be selected.</p> <p>Jffgg: Connection setting (Omissible. If omitted, connection is not made.)</p> <p>ff: Code number 01 to 08</p> <p>gg: No. of divided codes 01 to 08</p> |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Zh: Attachment of Zipper block and Contrast block  
(Omissible. If omitted, they are not attached.)

h= 0: No attachment of Zipper block and Contrast block  
1: Attachment of Zipper block and Contrast block  
2: Attachment of Zipper block  
3: Attachment of Contrast block

mmm ----- mmm: Data string to be printed (Omissible)  
Max. 93 digits

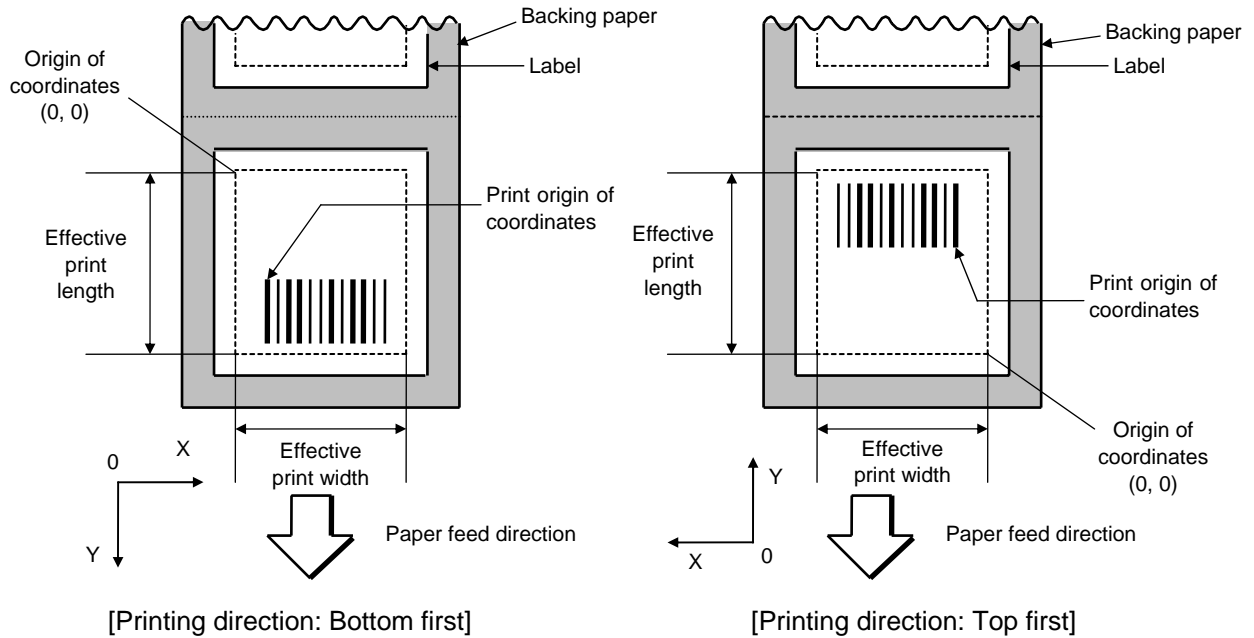
nn<sub>1</sub>, nn<sub>2</sub>, nn<sub>3</sub>, -----, nn<sub>20</sub>: Link field No. (Omissible)  
01 to 99 (1 to 99 can also be used.)  
Up to 20 fields can be designated using commas.

Explanation

- (1) Two-dimensional code number

When drawing by the Data Command ([ESC] RB), the format designated by the two-dimensional code number is selected.

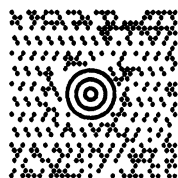
- (2) Print origin of coordinates



The print origin of coordinates must be set so that the two-dimensional code drawing result will be within the effective print area set by the Label Size Set Command ([ESC] D).

- (3) Type of two-dimensional code

Z: MaxiCode



- (4) Data string to be printed

Drawing data can be programmed by designating the number of digits after the symbol “=” The maximum number of digits to be printed is 93.

- (5) Connection setting

For MaxiCode, data can be divided into several codes. The data can be divided into a max. of 8 codes.

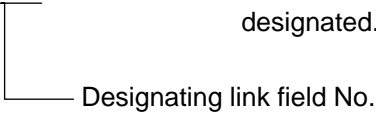
(6) Link field No.

The link field No. can be programmed by designating it after the symbol “;.”  
 After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.  
 Up to 20 fields can be linked.  
 The following shows an example of linked fields on the two continuous labels.

[Format Command]

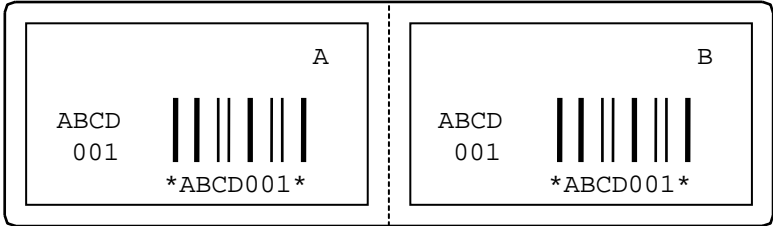
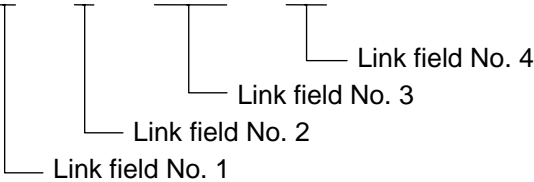
[ESC] PC01;..... ; 01 [LF] [NUL] : Link field No. 1 is designated.  
 [ESC] PC02;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC03;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB01;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[ESC] PC04;..... ; 02 [LF] [NUL] : Link field No. 2 is designated.  
 [ESC] PC05;..... ; 03 [LF] [NUL] : Link field No. 3 is designated.  
 [ESC] PC06;..... ; 04 [LF] [NUL] : Link field No. 4 is designated.  
 [ESC] XB02;..... ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.



[Data Command]

[ESC] RV; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]



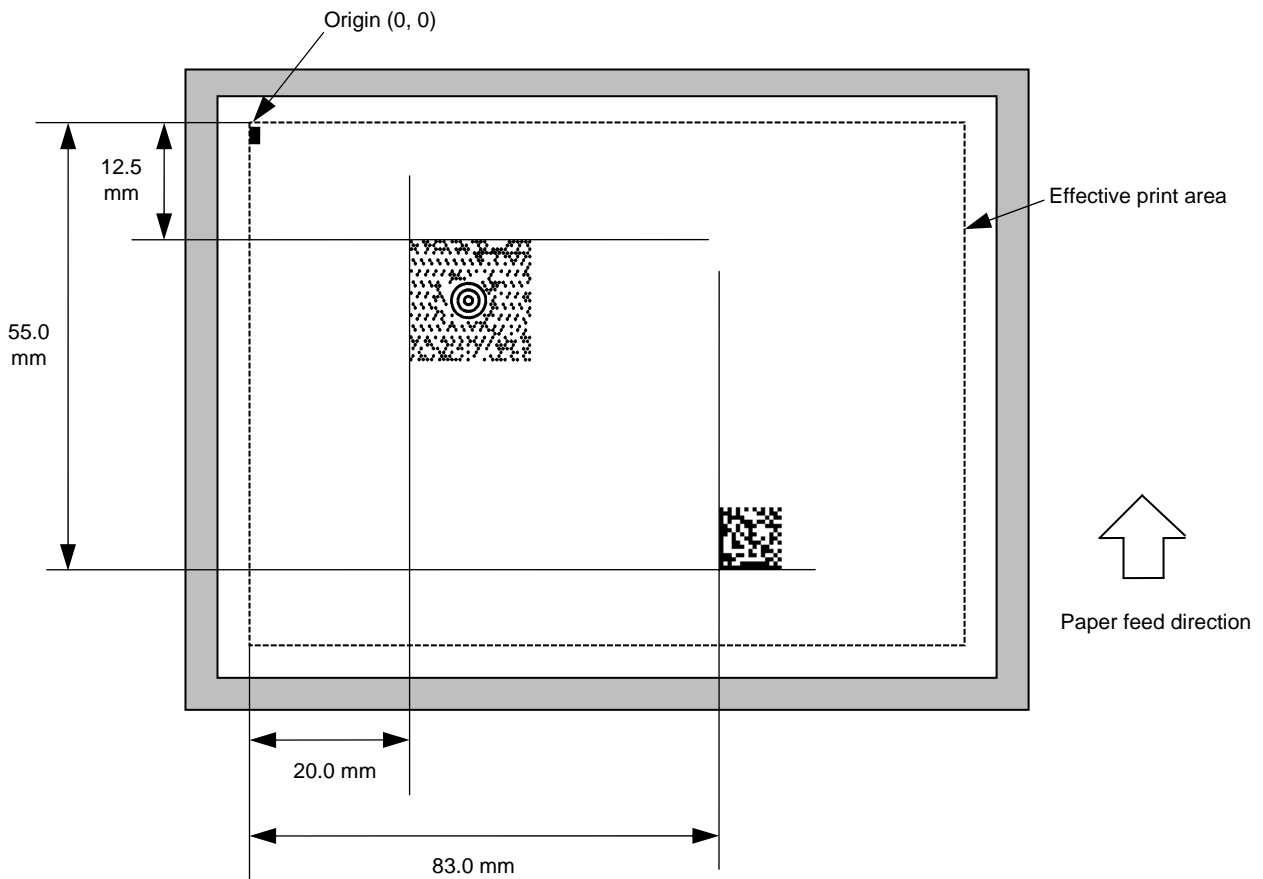
Notes

- (1) More than one Two-dimensional Code Format Command can be connected when transmitted.  
[ESC] XB01; 0100, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF]  
B02; 0350, 0150, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
- (2) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the two-dimensional code number, then the next drawing data is printed. Therefore, the two-dimensional code number which differs according to the drawing fields should be designated.
- (3) Since the automatic field clear is not performed between the Clear Command ([ESC] C) and Issue Command ([ESC] XS), the fixed data may be drawn using the same two-dimensional code number. In this case, the Format Command and Data Command should be sent alternately. (After the Issue Command is sent, the fields with the same two-dimensional code number are automatically cleared until the Clear Command is sent.)
- (4) The link field designation is cleared by omitting the link field designation using the same two-dimensional code No. and reformatting data. The link field designation can be also cleared by the Image Buffer Clear Command.
- (5) A print data string and link field No. cannot be programmed at the same time.

Refer to

- Bit Map Font Format Command ([ESC] PC)
- Outline Font Format Command ([ESC] PV)
- Barcode/Two-dimensional Code Data Command ([ESC] RB)

Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, Z [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; 123456789123123MaxiCode [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

## 5.7 COMMANDS RELATED TO PRINT DATA

### 5.7.1 BIT MAP FONT DATA COMMAND

[ESC] RC

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Provides data for the bit map font row.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format   | <p>① [ESC] RCaaa; bbb ----- bbb [LF] [NUL]</p> <p>② Link Field Data Command<br/>[ESC] RC; ccc --- ccc [LF] ddd --- ddd [LF] ----- [LF] xxx --- xxx [LF] [NUL]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Term     | <p>aaa: Character string number<br/>000 to 199 (Two digits, 00 to 99, also acceptable.)<br/>When 000 and 00 are designated at the same time, the data designated later is automatically selected.</p> <p>bbb ----- bbb: Data string to be printed<br/>Max. 255 characters<br/>(Max. 127 characters when the font type is U, V, r, s, w or 51, and max. 63 characters when it is r as a 4-byte code.)<br/>Any excess data will be discarded.<br/>For character codes, refer to the character code table mentioned later.</p> <p>ccc ----- ccc: Data string of link field No. 1</p> <p>ddd ----- ddd: Data string of link field No. 2</p> <p>⇕</p> <p>xxx ----- xxx: Data string of link field No. 99</p> |



Explanation

(1) Link field data string

- After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.
- Up to 255 characters of data strings can be linked. However, when the font type is U, V, r, s, w or 51, up to 127 characters can be linked. When it is r as a 4-byte code, up to 63 characters can be linked.  
When the number of characters exceeds the maximum number of digits, the excess data will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted using the Link Field Data Command, the following process is performed:
  - ① No process will be performed for the field which contains no print data due to the omission.
  - ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields and barcode fields.
- (The same result is obtained when any of the “RC,” “RV” or “RB” command code is designated.)

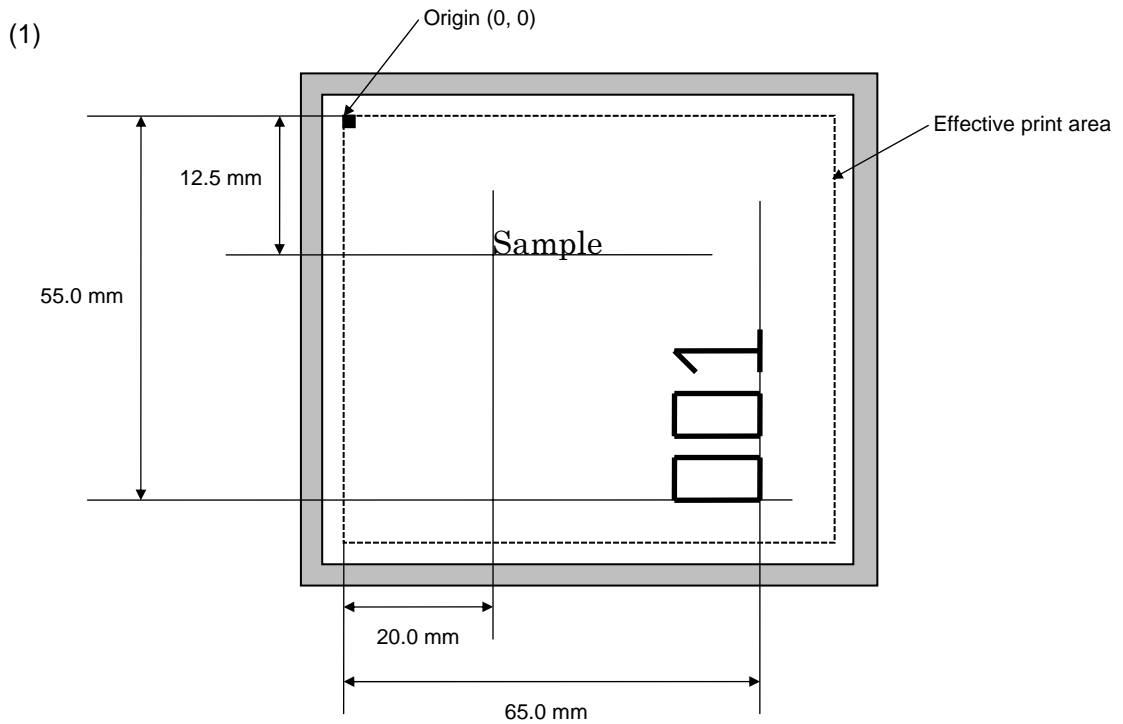
Notes

- (1) For character sets from 41 to 43, a character code consisting of 1 byte is stored. However, when the character code is read, F0H is added to the upper digit or FFH is added to the upper digit with Chinese characters installed, and consists of 2 bytes. In this case, up to 188 characters can be stored per character set.

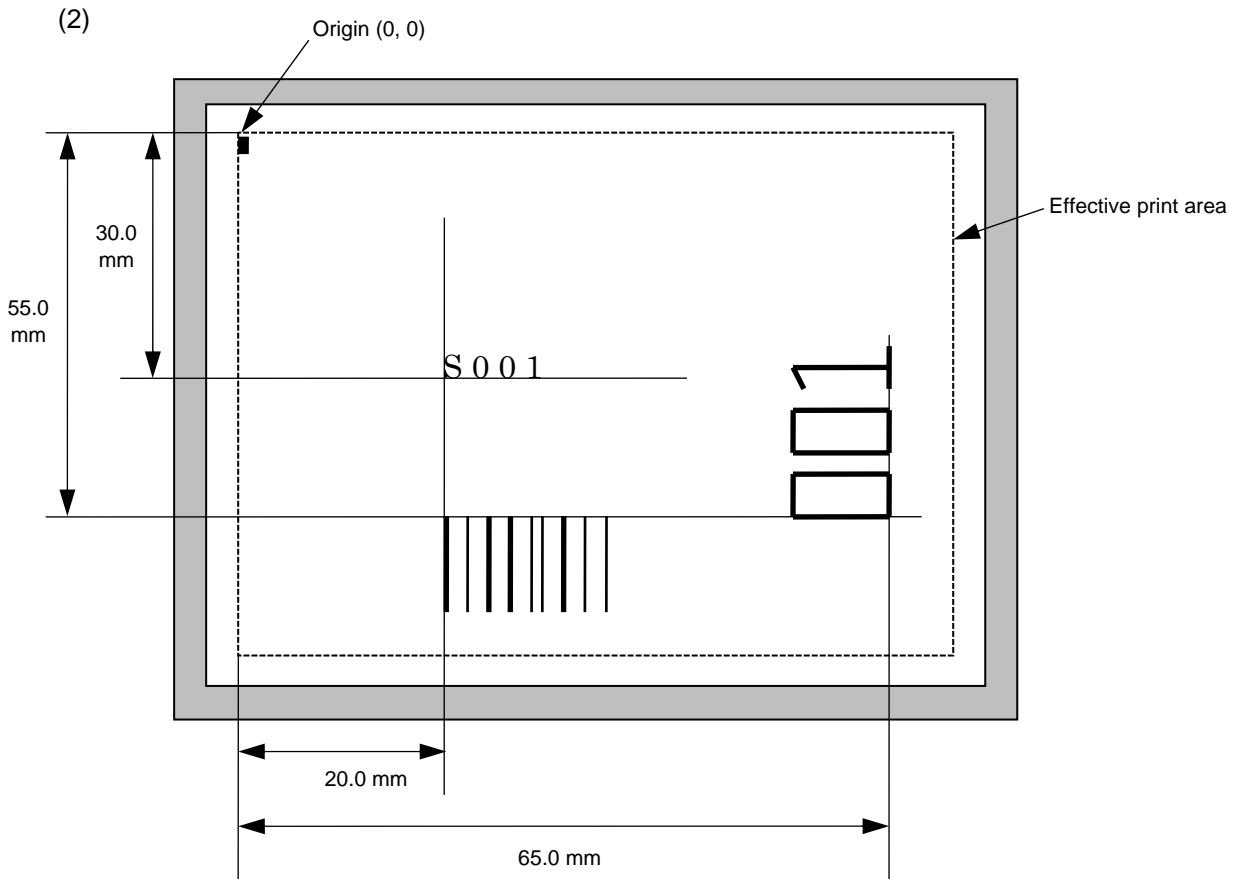
Refer to

- Bit Map Font Data Command ([ESC] RC)

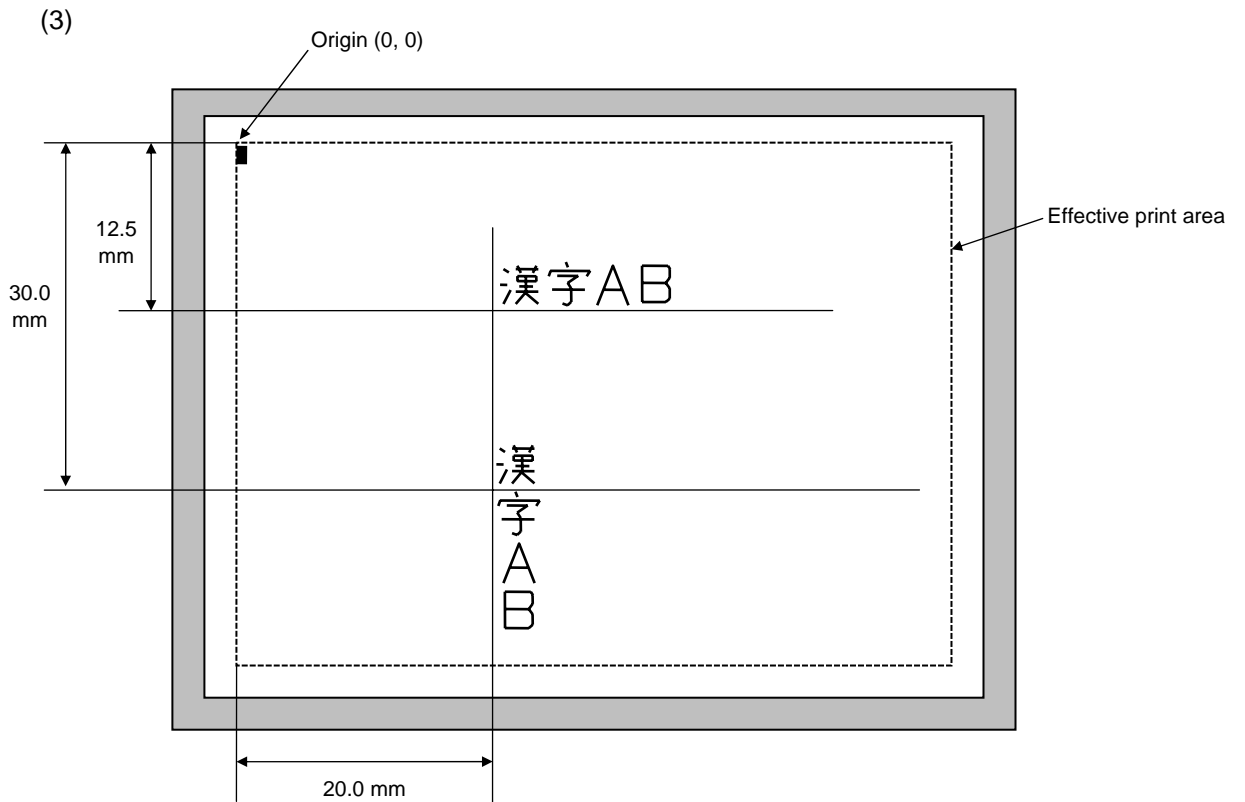
Examples



```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, C, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 03, 03, 08, 08, 03, 0, 0150; 01, 02 [LF] [NUL]
[SSC] RC; S001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



```
[ESC] C [LF] [NUL]
[ESC] PC000; 0200, 0125, 1, 1, W, 00, B [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, W, 01, B [LF] [NUL]
[ESC] RC000; 漢字 AB [LF] [NUL]
[ESC] RC001; 漢字 AB [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

## 5.7.2 OUTLINE FONT DATA COMMAND

[ESC] RV

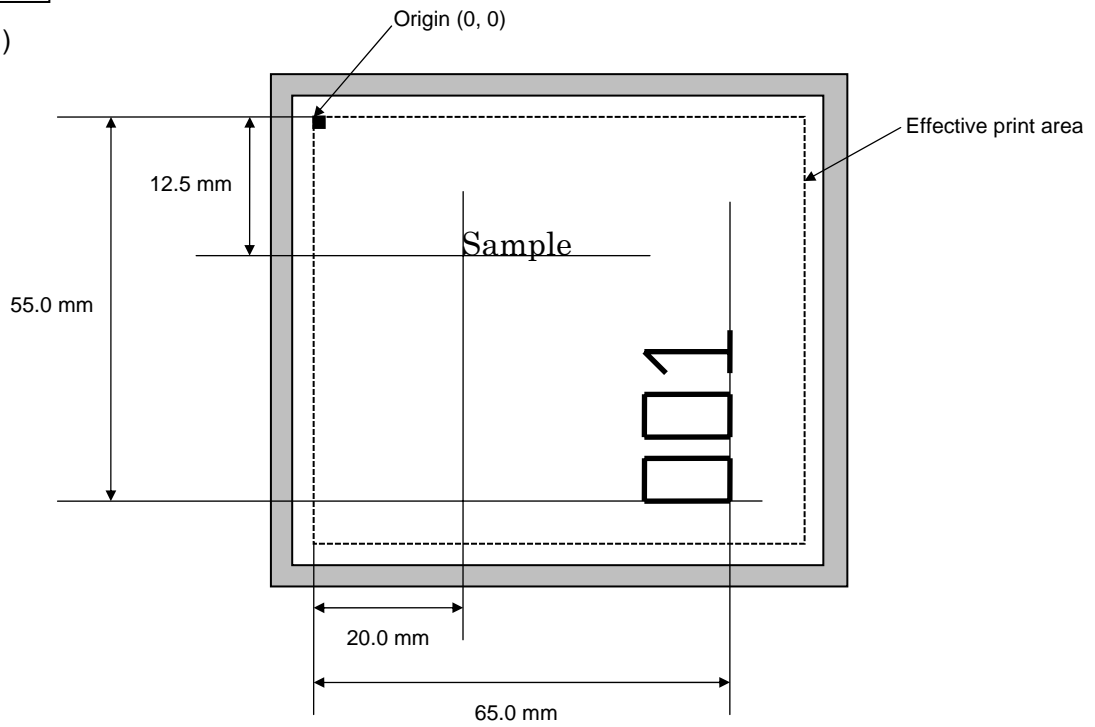
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Provides data for the outline font row.                                                                                                                                                                                                                                                                                                                                                                                                            |
| Format   | <p>① [ESC] RVaa; bbb ----- bbb [LF] [NUL]</p> <p>② Link Field Data Command<br/>[ESC] RV; ccc --- ccc [LF] ddd --- ddd [LF] ----- [LF] xxx --- xxx [LF] [NUL]</p>                                                                                                                                                                                                                                                                                   |
| Term     | <p>aa: Character string number<br/>00 to 99</p> <p>bbb ----- bbb: Data string to be printed<br/>Max. 255 characters<br/>Any excess data will be discarded.<br/>For character codes, refer to the character code table mentioned later.</p> <p>ccc ----- ccc: Data string of link field No. 1</p> <p>ddd ----- ddd: Data string of link field No. 2</p> <p style="text-align: center;">⇕</p> <p>xxx ----- xxx: Data string of link field No. 99</p> |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | <p>(1) Link field data string</p> <ul style="list-style-type: none"> <li>• After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.</li> <li>• Up to 255 characters of data strings can be linked. However, when the font type is C, up to 127 characters can be linked.<br/>When the number of characters exceeds the maximum number of digits, the excess data will be discarded.</li> <li>• Up to 99 data strings can be linked.</li> <li>• Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.</li> <li>• When the data string is omitted using the Link Field Data Command, the following process is performed: <ul style="list-style-type: none"> <li>① No process will be performed for the field which contains no print data due to the omission.</li> <li>② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.</li> </ul> </li> <li>• The Link Field Data Command can be used for the bit map font fields, outline font fields and barcode fields.</li> <li>• (The same result is obtained when any of the “RC,” “RV” or “RB” command code is designated.)</li> </ul> |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

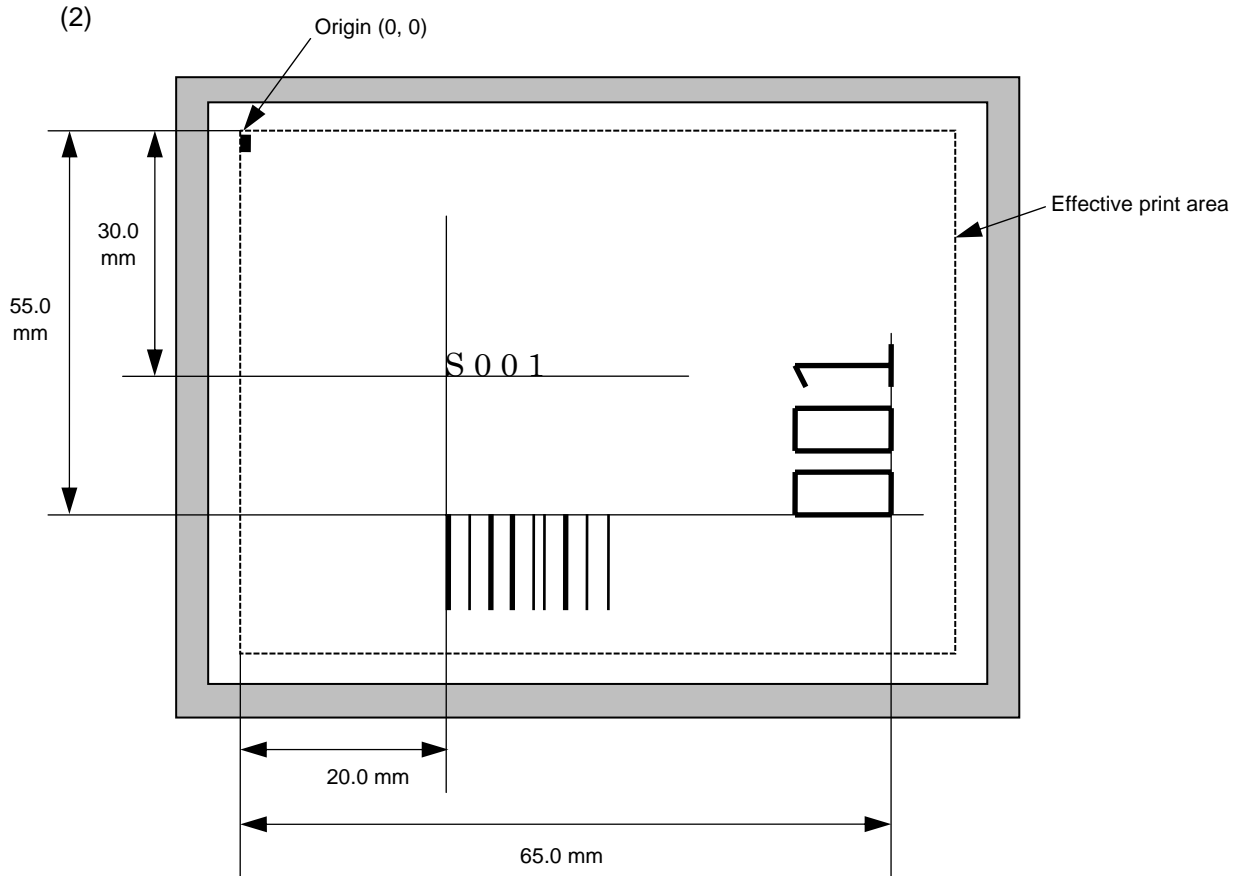
|          |                                        |
|----------|----------------------------------------|
| Refer to | Outline Font Format Command ([ESC] PV) |
|----------|----------------------------------------|

Examples

(1)



```
[ESC] C [LF] [NUL]
[ESC] PV01; 0200, 0125, 0100, 0100, B, 00, B [LF] [NUL]
[ESC] PV02; 0650, 0550, 0200, 0150, B, 33, B, +0000000001 [LF] [NUL]
[ESC] RV01; Sample [LF] [NUL]
[ESC] RV02; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```



```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02 [LF] [NUL]
[SSC] RC; S001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

### 5.7.3 BARCODE/TWO-DIMENSIONAL CODE DATA COMMAND (Any codes other than MaxiCode) [ESC] RB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Provides data for the barcode/two-dimensional code.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Format   | <p>① [ESC] RBaa; bbb ----- bbb [LF] [NUL]</p> <p>② Link Field Data Command<br/>[ESC] RB; ccc --- ccc [LF] ddd --- ddd [LF] ----- [LF] xxx --- xxx [LF] [NUL]</p>                                                                                                                                                                                                                                                                                                                         |
| Term     | <p>aa:                 Barcode/two-dimensional code number<br/>                          00 to 31</p> <p>bbb ----- bbb: Data string to be printed<br/>                          The maximum number of digits varies according to the type of<br/>                          barcode/two-dimensional code.</p> <p>ccc ----- ccc: Data string of link field No. 1</p> <p>ddd ----- ddd: Data string of link field No. 2</p> <p>⇕</p> <p>xxx ----- xxx: Data string of link field No. 99</p> |



Explanation

(1) Link field data string

- After the link field No. is designated using the Format Command, the data strings are linked by the Link Field Data Command to draw an image.
- When the barcode type is Data Matrix or PDF417, up to 2000 digits of data strings can be linked. When it is other than Data Matrix or PDF417, up to 126 digits can be linked. (It varies according to the type of barcode.)  
When the number of digits exceeds the maximum number of digits, the excess data will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted using the Link Field Data Command, the following process is performed:
  - ① No process will be performed for the field which contains no print data due to the omission.
  - ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields and barcode fields.
- (The same result is obtained when any of the “RC,” “RV” or “RB” command code is designated.)

(2) Data check

If the data row contains data which does not meet the type of barcode, a barcode will not be drawn. If wrong code selection takes place in the data row of CODE128 (without auto code selection), the barcode will not be drawn.

In case of Data Matrix, if there is data different from the one designated using the format ID, a symbol is not drawn.

(3) No. of digits of data

When data exceeding the maximum number of digits is sent, the excess data will be discarded. For the maximum number of digits for each barcode, see below.

|                                    |                 |
|------------------------------------|-----------------|
| Data Matrix, PDF417, QR code:      | 2000 digits     |
| MicroPDF417:                       | 366 digits      |
| MaxiCode:                          | 93 digits       |
| Customer barcode:                  | 20 digits       |
| Highest priority customer barcode: | 19 digits       |
| POSTNET:                           | 5, 9, 11 digits |
| ROYAL MAIL 4 STATE CUSTOMER CODE:  | 12 digits       |
| KIX CODE:                          | 18 digits       |
| Barcodes other than the above      | 126 digits      |

When the number of digits does not correspond to the barcode type, the barcode is not drawn.

- (4) The maximum number of digits for Data Matrix varies according to the settings for ECC type, format ID, and the cell size. In the case of Kanji, the maximum number of digits becomes half of the values described below since a Kanji character occupies 2 bytes.

Max number of digits for Data Matrix

|             | ECC000 | ECC050 | ECC080 | ECC100 | ECC140 |
|-------------|--------|--------|--------|--------|--------|
| Format ID 1 | 500    | 457    | 402    | 300    | 144    |
| Format ID 2 | 452    | 333    | 293    | 218    | 105    |
| Format ID 3 | 394    | 291    | 256    | 190    | 91     |
| Format ID 4 | 413    | 305    | 268    | 200    | 96     |
| Format ID 5 | 310    | 228    | 201    | 150    | 72     |
| Format ID 6 | 271    | 200    | 176    | 131    | 63     |

|        | Numeric | Alphanumeric | 8 bit |
|--------|---------|--------------|-------|
| ECC200 | 2000    | 2000         | 1556  |

Cell Size and Effective Data Capacity

| Symbol size |     | ECC000           |                   |                     | ECC050           |                   |                     | ECC080           |                   |                     | ECC100           |                   |                     | ECC140           |                   |                     |
|-------------|-----|------------------|-------------------|---------------------|------------------|-------------------|---------------------|------------------|-------------------|---------------------|------------------|-------------------|---------------------|------------------|-------------------|---------------------|
|             |     | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity | Numeric capacity | Alphanum capacity | 8-bit byte capacity |
| Row         | Col |                  |                   |                     |                  |                   |                     |                  |                   |                     |                  |                   |                     |                  |                   |                     |
| 9           | 9   | 3                | 2                 | 1                   | —                | —                 | —                   | —                | —                 | —                   | —                | —                 | —                   | —                | —                 | —                   |
| 11          | 11  | 12               | 8                 | 5                   | 1                | 1                 | —                   | —                | —                 | —                   | —                | —                 | —                   | —                | —                 | —                   |
| 13          | 13  | 24               | 16                | 10                  | 10               | 6                 | 4                   | 4                | 3                 | 2                   | 1                | 1                 | —                   | —                | —                 | —                   |
| 15          | 15  | 37               | 25                | 16                  | 20               | 13                | 9                   | 13               | 9                 | 6                   | 8                | 5                 | 3                   | —                | —                 | —                   |
| 17          | 17  | 53               | 35                | 23                  | 32               | 21                | 14                  | 24               | 16                | 10                  | 16               | 11                | 7                   | 2                | 1                 | 1                   |
| 19          | 19  | 72               | 48                | 31                  | 46               | 30                | 20                  | 36               | 24                | 16                  | 25               | 17                | 11                  | 6                | 4                 | 3                   |
| 21          | 21  | 92               | 61                | 40                  | 61               | 41                | 27                  | 50               | 33                | 22                  | 36               | 24                | 15                  | 12               | 8                 | 5                   |
| 23          | 23  | 115              | 76                | 50                  | 78               | 52                | 34                  | 65               | 43                | 28                  | 47               | 31                | 20                  | 17               | 11                | 7                   |
| 25          | 25  | 140              | 93                | 61                  | 97               | 65                | 42                  | 82               | 54                | 36                  | 60               | 40                | 26                  | 24               | 16                | 10                  |
| 27          | 27  | 168              | 112               | 73                  | 118              | 78                | 51                  | 100              | 67                | 44                  | 73               | 49                | 32                  | 30               | 20                | 13                  |
| 29          | 29  | 197              | 131               | 86                  | 140              | 93                | 61                  | 120              | 80                | 52                  | 88               | 59                | 38                  | 38               | 25                | 16                  |
| 31          | 31  | 229              | 153               | 100                 | 164              | 109               | 72                  | 141              | 94                | 62                  | 104              | 69                | 45                  | 46               | 30                | 20                  |
| 33          | 33  | 264              | 176               | 115                 | 190              | 126               | 83                  | 164              | 109               | 72                  | 121              | 81                | 53                  | 54               | 36                | 24                  |
| 35          | 35  | 300              | 200               | 131                 | 217              | 145               | 95                  | 188              | 125               | 82                  | 140              | 93                | 61                  | 64               | 42                | 28                  |
| 37          | 37  | 339              | 226               | 148                 | 246              | 164               | 108                 | 214              | 143               | 94                  | 159              | 106               | 69                  | 73               | 49                | 32                  |
| 39          | 39  | 380              | 253               | 166                 | 277              | 185               | 121                 | 242              | 161               | 106                 | 180              | 120               | 78                  | 84               | 56                | 36                  |
| 41          | 41  | 424              | 282               | 185                 | 310              | 206               | 135                 | 270              | 180               | 118                 | 201              | 134               | 88                  | 94               | 63                | 41                  |
| 43          | 43  | 469              | 313               | 205                 | 344              | 229               | 150                 | 301              | 201               | 132                 | 224              | 149               | 98                  | 106              | 70                | 46                  |
| 45          | 45  | 500              | 345               | 226                 | 380              | 253               | 166                 | 333              | 222               | 146                 | 248              | 165               | 108                 | 118              | 78                | 51                  |
| 47          | 47  | 500              | 378               | 248                 | 418              | 278               | 183                 | 366              | 244               | 160                 | 273              | 182               | 119                 | 130              | 87                | 57                  |
| 49          | 49  | 500              | 413               | 271                 | 457              | 305               | 200                 | 402              | 268               | 176                 | 300              | 200               | 131                 | 144              | 96                | 63                  |

| Symbol size |     | ECC200           |                   |                     |
|-------------|-----|------------------|-------------------|---------------------|
|             |     | Numeric capacity | Alphanum capacity | 8-bit byte capacity |
| Row         | Col |                  |                   |                     |
| 10          | 10  | 6                | 3                 | 1                   |
| 12          | 12  | 10               | 6                 | 3                   |
| 14          | 14  | 16               | 10                | 6                   |
| 16          | 16  | 24               | 16                | 10                  |
| 18          | 18  | 36               | 25                | 16                  |
| 20          | 20  | 44               | 31                | 20                  |
| 22          | 22  | 60               | 43                | 28                  |
| 24          | 24  | 72               | 52                | 34                  |
| 26          | 26  | 88               | 64                | 42                  |
| 32          | 32  | 124              | 91                | 60                  |
| 36          | 36  | 172              | 127               | 84                  |
| 40          | 40  | 228              | 169               | 112                 |
| 44          | 44  | 288              | 214               | 142                 |
| 48          | 48  | 348              | 259               | 172                 |
| 52          | 52  | 408              | 304               | 202                 |
| 64          | 64  | 560              | 418               | 278                 |
| 72          | 72  | 736              | 550               | 366                 |
| 80          | 80  | 912              | 682               | 454                 |
| 88          | 88  | 1152             | 862               | 574                 |
| 96          | 96  | 1392             | 1042              | 694                 |
| 104         | 104 | 1632             | 1222              | 814                 |
| 120         | 120 | 2000             | 1573              | 1048                |
| 132         | 132 | 2000             | 1954              | 1302                |
| 144         | 144 | 2000             | 2000              | 1556                |

Rectangular code

| Symbol size |     | ECC200           |                   |                     |
|-------------|-----|------------------|-------------------|---------------------|
|             |     | Numeric capacity | Alphanum capacity | 8-bit byte capacity |
| Row         | Col |                  |                   |                     |
| 8           | 18  | 10               | 6                 | 3                   |
| 8           | 32  | 20               | 13                | 8                   |
| 12          | 26  | 32               | 22                | 14                  |
| 12          | 36  | 44               | 31                | 20                  |
| 16          | 36  | 64               | 46                | 30                  |
| 16          | 48  | 98               | 72                | 47                  |

- (5) When PDF417 or MicroPDF417 is used, the number of symbol characters, called code words, is limited to 928 or less. Moreover, the data compression rate varies according to the data. Therefore, the maximum number of digits according to the mode is as follows. When letters and numerics are mixed in data in EXC mode, for example, the maximum values become smaller than the values below, since the internal mode selection code is used.

To correct a reading error by designating the security level, the maximum value becomes further smaller, since the error correction code words below are used.

When the number of the code words exceeds 928, or when the number of rows exceeds 90, a symbol is not drawn.

For the MicroPDF417, the numbers of rows and columns can be specified. The maximum number of digits varies according to the setting.

PDF417

- Extended Alphanumeric Compaction (EXC) mode: 1850 digits
- Binary/ASCII Plus mode: 1108 digits
- Numeric compaction mode: 2000 digits

MicroPDF417

- Binary mode: 150 digits
- Upper case letter/space mode: 250 digits
- Numeric compaction mode: 366 digits

No. of Error Correction Code Words of PDF417  
(For the MicroPDF417, the printer sets the security level automatically.)

| Security level | Error Correction Ability                                                                                                                                                                                                                                                                                               | No. of error correction code words |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Level 0        | <div style="display: flex; flex-direction: column; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Low</div> <div style="margin-bottom: 10px;">↑</div> <div style="margin-bottom: 10px;">↓</div> <div style="border: 1px solid black; padding: 5px;">High</div> </div> | 0                                  |
| Level 1        |                                                                                                                                                                                                                                                                                                                        | 2                                  |
| Level 2        |                                                                                                                                                                                                                                                                                                                        | 6                                  |
| Level 3        |                                                                                                                                                                                                                                                                                                                        | 14                                 |
| Level 4        |                                                                                                                                                                                                                                                                                                                        | 30                                 |
| Level 5        |                                                                                                                                                                                                                                                                                                                        | 62                                 |
| Level 6        |                                                                                                                                                                                                                                                                                                                        | 126                                |
| Level 7        |                                                                                                                                                                                                                                                                                                                        | 254                                |
| Level 8        |                                                                                                                                                                                                                                                                                                                        | 510                                |

The maximum number of columns and rows for the MicroPDF417

| Parameter (gg) | No. of columns | No. of rows | Max. number of digits for binary mode | Max. number of digits for upper case letter/space mode | Max. number of digits for numeric mode |
|----------------|----------------|-------------|---------------------------------------|--------------------------------------------------------|----------------------------------------|
| 00             | —              | —           | 150                                   | 250                                                    | 366                                    |
| 01             | 1              | —           | 22                                    | 38                                                     | 55                                     |
| 02             | 2              | —           | 43                                    | 72                                                     | 105                                    |
| 03             | 3              | —           | 97                                    | 162                                                    | 237                                    |
| 04             | 4              | —           | 150                                   | 250                                                    | 366                                    |
| 05             | 1              | 11          | 3                                     | 6                                                      | 8                                      |
| 06             |                | 14          | 7                                     | 12                                                     | 17                                     |
| 07             |                | 17          | 10                                    | 18                                                     | 26                                     |
| 08             |                | 20          | 13                                    | 22                                                     | 32                                     |
| 09             |                | 24          | 18                                    | 30                                                     | 44                                     |
| 10             |                | 28          | 22                                    | 38                                                     | 55                                     |
| 11             | 2              | 8           | 8                                     | 14                                                     | 20                                     |
| 12             |                | 11          | 14                                    | 24                                                     | 35                                     |
| 13             |                | 14          | 21                                    | 36                                                     | 52                                     |
| 14             |                | 17          | 27                                    | 46                                                     | 67                                     |
| 15             |                | 20          | 33                                    | 56                                                     | 82                                     |
| 16             |                | 23          | 38                                    | 64                                                     | 93                                     |
| 17             | 26             | 43          | 72                                    | 105                                                    |                                        |
| 18             | 3              | 6           | 6                                     | 10                                                     | 14                                     |
| 19             |                | 8           | 10                                    | 18                                                     | 26                                     |
| 20             |                | 10          | 15                                    | 26                                                     | 38                                     |
| 21             |                | 12          | 20                                    | 34                                                     | 49                                     |
| 22             |                | 15          | 27                                    | 46                                                     | 67                                     |
| 23             |                | 20          | 39                                    | 66                                                     | 96                                     |
| 24             |                | 26          | 54                                    | 90                                                     | 132                                    |
| 25             |                | 32          | 68                                    | 114                                                    | 167                                    |
| 26             |                | 38          | 82                                    | 138                                                    | 202                                    |
| 27             |                | 44          | 97                                    | 162                                                    | 237                                    |
| 28             | 4              | 4           | 8                                     | 14                                                     | 20                                     |
| 29             |                | 6           | 13                                    | 22                                                     | 32                                     |
| 30             |                | 8           | 20                                    | 34                                                     | 49                                     |
| 31             |                | 10          | 27                                    | 46                                                     | 67                                     |
| 32             |                | 12          | 34                                    | 58                                                     | 85                                     |
| 33             |                | 15          | 45                                    | 76                                                     | 111                                    |
| 34             |                | 20          | 63                                    | 106                                                    | 155                                    |
| 35             |                | 26          | 85                                    | 142                                                    | 208                                    |
| 36             |                | 32          | 106                                   | 178                                                    | 261                                    |
| 37             |                | 38          | 128                                   | 214                                                    | 313                                    |
| 38             |                | 44          | 150                                   | 250                                                    | 366                                    |

(6) CODE128 code selection

In the case of CODE128 (with auto code selection), code selection is performed in the following manner. (Conforming to USS-128 APPENDIX-G)

- ① Determining the start character
  - (a) If the data begins with four or more consecutive numerals, the start code to be used is (CODE C).
  - (b) In any case other than (a) in ①, if a control character appears before a small letter (see ④.) or four or more consecutive numerals, the start code is (CODE A).
  - (c) In none of the above cases, the start code is (CODE B).
- ② If the data begins with an odd number of digits in (a), ①:
  - (a) Insert the (CODE A) or (CODE B) character just before the last numeric data. When (FNC1), if found in the number, breaks a pair of digits in the number, insert the (CODE A) or (CODE B) character before the numeric data preceding the (FNC1). Selection of (CODE A) or (CODE B) should conform to (b) and (c) in ①.
- ③ If four or more digits of numeric data continue in (CODE A) or (CODE B).
  - (a) When the numeric data is an even number of digits, insert the (CODE C) character just before the first numeric data.
  - (b) When the numeric data is an odd number of digits, insert the (CODE C) character immediately after the first numeric data.
- ④ If a control character appears in (CODE B):
  - (a) In the subsequent data, when a small letter appears before the next control character or four or more consecutive digits, insert the (SHIFT) character before the first control character.
  - (b) When not so, insert the (CODE B) character just before the first control character.
- ⑤ If a small letter appears in (CODE A):
  - (a) In the subsequent data, when a control character appears before the next small letter or four or more consecutive digits, insert the (SHIFT) character before the first small letter.
  - (b) When not so, insert the (CODE B) character just before the first small letter.
- ⑥ If any data other than the numerals appears in (CODE C):
  - (a) Insert the (CODE A) or (CODE B) character just before the data other than the numerals. Selection of (CODE A) or (CODE B) should conform to (b) and (c) in ①.

\* Refer to chapter 16 "CODE128 Value Code Table."

(7) CODE128 code selection check

Check if selection of (CODE A), (CODE B) or (CODE C) of CODE128 has been set correctly. If an error is found, the barcode will not be drawn.

[Conditions causing an error]

- ① No start code is designated.
- ② A small letter (including { , | , } , ~ , \_ ) is found in (CODE A).
- ③ A control character is found in (CODE B).
- ④ Any data other than the numerals, (FNC1), (CODE A) and (CODE B) is found in (CODE C).
- ⑤ There are two or more consecutive (SHIFT) characters.
- ⑥ The number in (CODE C) is an odd number of digits.
- ⑦ (SHIFT) is followed by (CODE A), (CODE B) or (CODE C).

(8) Kanji code selection

- In the case of Data Matrix, PDF417 and QR code, Kanji codes can be printed. Shift JIS, JIS hexadecimal, JIS 8, or the mixture of these codes can be used.

(9) When manual mode is selected in the Format Command for a QR code

- ① Numeric mode, alphanumeric and symbol mode, Kanji mode

|                |                    |
|----------------|--------------------|
| Mode selection | Data to be printed |
|----------------|--------------------|

- ② Binary mode

|                |                                   |                    |
|----------------|-----------------------------------|--------------------|
| Mode selection | No. of data strings<br>(4 digits) | Data to be printed |
|----------------|-----------------------------------|--------------------|

- ③ Mixed mode

|      |             |      |             |      |
|------|-------------|------|-------------|------|
| Data | “,” (comma) | Data | “,” (comma) | Data |
|------|-------------|------|-------------|------|

QR code can handle all codes including alphanumerics, symbols and Kanji. Since the data compression rate varies according to the code, a code to be used is designated when the mode is selected.

| Mode | Code                   | Details                                 |
|------|------------------------|-----------------------------------------|
| N    | Numerics               | 0 to 9                                  |
| A    | Alphanumerics, symbols | A to Z 0 to 9 space<br>\$ % * + - . / : |
| B    | Binary (8-bit)         | 00H to FFH                              |
| K    | Kanji                  | Shift JIS, JIS hexadecimal              |

If mixed mode is selected, up to 200 modes can be selected in a QR code.

(10) When the automatic mode is selected using the Format Command for QR code.

Data to be printed

① How to transmit the control code data

|           |   |                |
|-----------|---|----------------|
| NUL (00H) | = | > @ (3EH, 40H) |
| SOH (01H) | = | > A (3EH, 41H) |
| STX (02H) | = | > B (3EH, 42H) |
| ⋮         |   |                |
| GS (1DH)  | = | > ] (3EH, 5DH) |
| RS (1EH)  | = | > ^ (3EH, 5EH) |
| US (1FH)  | = | > _ (3EH, 5FH) |

② How to transmit the special codes

|         |   |                |
|---------|---|----------------|
| > (3EH) | = | > 0 (3EH, 30H) |
|---------|---|----------------|

(11) Transfer code for QR code

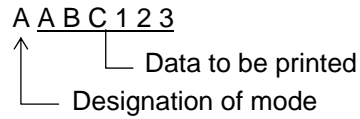
|   | 0   | 1   | 2  | 3 | 4 | 5 | 6 | 7   | 8 | 9 | A | B | C | D | E | F |
|---|-----|-----|----|---|---|---|---|-----|---|---|---|---|---|---|---|---|
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p   |   |   |   |   |   |   |   |   |
| 1 | SOH | DC1 | !  | 1 | A | Q | a | q   |   |   |   |   |   |   |   |   |
| 2 | STX | DC2 | "  | 2 | B | R | b | r   |   |   |   |   |   |   |   |   |
| 3 | ETX | DC3 | #  | 3 | C | S | c | s   |   |   |   |   |   |   |   |   |
| 4 | EOT | DC4 | \$ | 4 | D | T | d | t   |   |   |   |   |   |   |   |   |
| 5 | ENQ | NAK | %  | 5 | E | U | e | u   |   |   |   |   |   |   |   |   |
| 6 | ACK | SYN | &  | 6 | F | V | f | v   |   |   |   |   |   |   |   |   |
| 7 | BEL | ETB | '  | 7 | G | W | g | w   |   |   |   |   |   |   |   |   |
| 8 | BS  | CAN | (  | 8 | H | X | h | x   |   |   |   |   |   |   |   |   |
| 9 | HT  | EM  | )  | 9 | I | Y | i | y   |   |   |   |   |   |   |   |   |
| A | LF  | SUB | *  | : | J | Z | j | z   |   |   |   |   |   |   |   |   |
| B | VT  | ESC | +  | ; | K | [ | k | {   |   |   |   |   |   |   |   |   |
| C | FF  | FS  | ,  | < | L | \ | l |     |   |   |   |   |   |   |   |   |
| D | CR  | GS  | -  | = | M | ] | m | }   |   |   |   |   |   |   |   |   |
| E | SO  | RS  | •  | > | N | ^ | n | ~   |   |   |   |   |   |   |   |   |
| F | SI  | US  | /  | ? | O | _ | o | DEL |   |   |   |   |   |   |   |   |

\* The shaded parts are Japanese.  
They are omitted here.

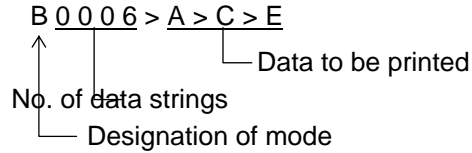


(12) Examples of data designation

① Alphanumeric mode: ABC123

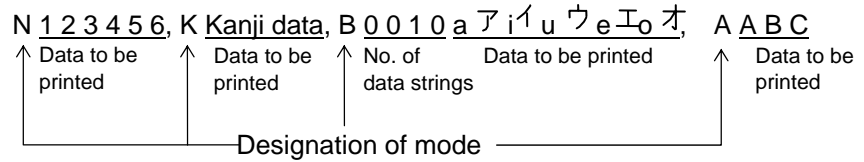


② Binary mode: 01h, 03h, 05h



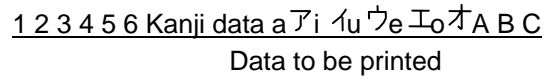
③ Mixed mode

Numeric mode: 123456  
 Kanji mode: Kanji data  
 Binary mode: aアiイuウeエoオ  
 Alphanumeric mode: ABC

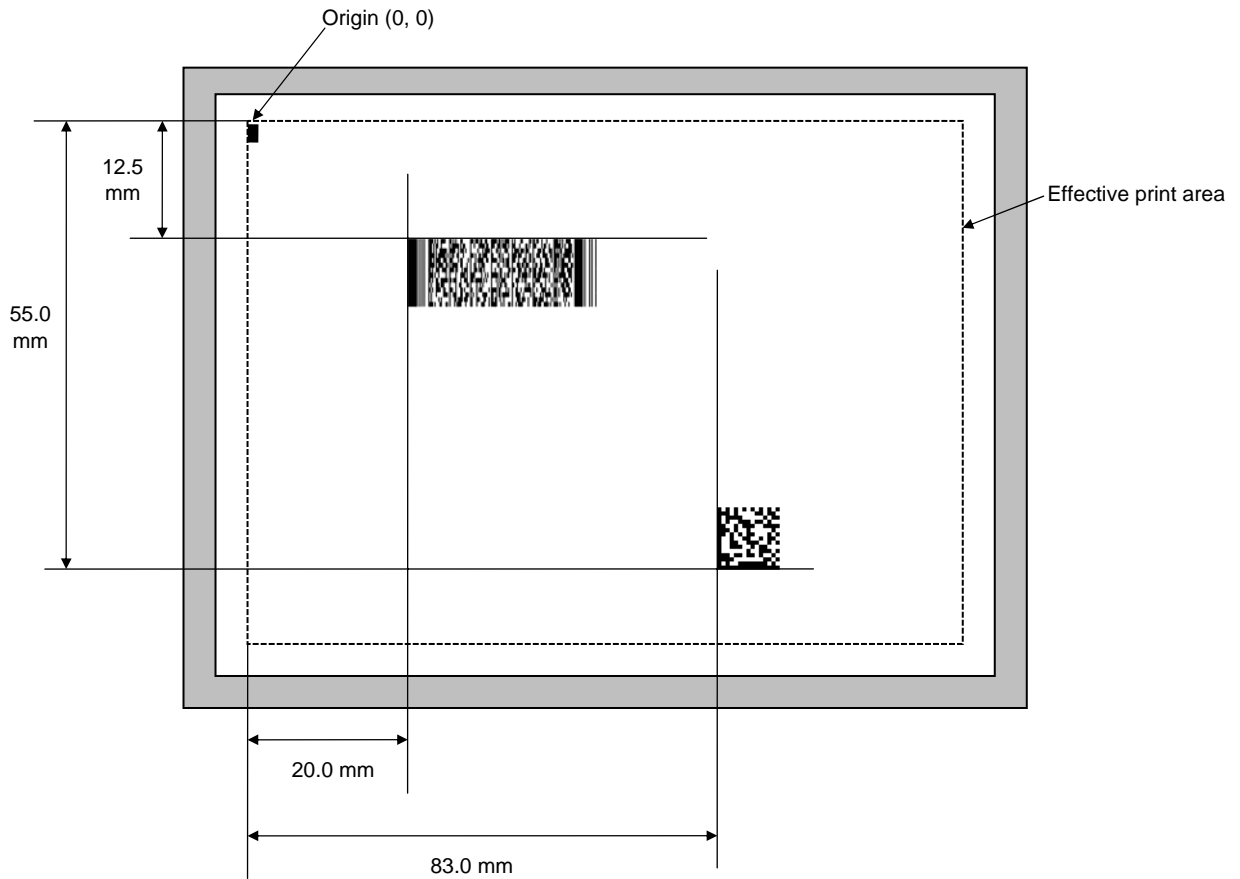


④ Automatic mode

When the data above (③) is designated in automatic mode:



Examples



```
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, P, 04, 02, 03, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; PDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
```

### 5.7.4 TWO-DIMENSIONAL CODE DATA COMMAND (MaxiCode) [ESC] RB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Provides data for the two-dimensional code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Format   | <p>For mode 2 or 3:<br/>[ESC] RBaa; bbbbbbbbbbccdddeeeee --- eeeee [LF] [NUL]</p> <p>For mode 4 or 6:<br/>[ESC] RBaa; ffffffffggggg --- ggggg [LF] [NUL]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Term     | <p>aa: Two-dimensional code number</p> <p>“Modes 2 and 3”</p> <p>bbbbbbbb: Postal code Fixed at 9 digits</p> <ul style="list-style-type: none"> <li>• Mode 2: <ul style="list-style-type: none"> <li>b<sub>1</sub>b<sub>2</sub>b<sub>3</sub>b<sub>4</sub>b<sub>5</sub>: Zip code Fixed at 5 digits (Numerics)</li> <li>b<sub>6</sub>b<sub>7</sub>b<sub>8</sub>b<sub>9</sub>: Zip code extension Fixed at 4 digits (Numerics)</li> </ul> </li> <li>• Mode 3: <ul style="list-style-type: none"> <li>b<sub>1</sub>b<sub>2</sub>b<sub>3</sub>b<sub>4</sub>b<sub>5</sub>b<sub>6</sub>: Zip code Fixed at 6 digits (Character “A” of code set)</li> <li>b<sub>7</sub>b<sub>8</sub>b<sub>9</sub>: Vacant Fixed at 3 digits (20H)</li> </ul> </li> </ul> <p>ccc: Class of service Fixed at 3 digits (Numerics)</p> <p>ddd: Country code Fixed at 3 digits (Numerics)</p> <p>eee --- eee: Message data strings 84 digits</p> <p>“Modes 4 and 6”</p> <p>fffffff: Primary message data strings 9 digits</p> <p>ggg --- ggg: Secondary message data strings 84 digits</p> |

|             |
|-------------|
| Explanation |
|-------------|

- (1) When any data other than numerics is included in the data string of zip code (mode 2), zip code extension, class of service, or country code, a MaxiCode is not drawn.
- (2) If the message data is less than 84 digits when mode 2 or 3 is selected, the printer adds one digit of CR (000000) at the end of the data, and the remaining digits will be filled with FSs (011100). When message data exceeding 84 digits is received, the excess data will be discarded before drawing a MaxiCode.
- (3) If the message data is less than 93 digits (9 digits + 84 digits) when mode 4 or 6 is selected, the printer adds one digit of CR (000000) at the end of the data, and the remaining digits will be filled with FSs (011100). When message data exceeding 93 digits is received, the excess data will be discarded before drawing a MaxiCode.
- (4) Mode 6 should not be used for usual operation since it is used for scanner programming.
- (5) When "TYPE2: Special specification" is set for MaxiCode specification setting in the SYSTEM mode and when Mode 2 is selected, the country code must be 840. Otherwise, a MaxiCode will not be drawn.
- (6) When "TYPE2: Special specification" is set for MaxiCode specification setting in the SYSTEM mode and when Mode 3 is selected, the country code must be other than 840. Otherwise, a MaxiCode will not be drawn.

## 5.8 COMMANDS RELATED TO ISSUE AND FEED

### 5.8.1 ISSUE COMMAND

[ESC] XS

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Issues labels according to the print conditions programmed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format   | [ESC] XS; I, aaaa, bbbcd efgh [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Term     | <p>aaaa: Number of labels to be issued<br/>0001 to 9999</p> <p>bbb: Reserved area<br/>000 to 100</p> <p>c: Type of sensor<br/>           0: No sensor<br/>           1: Reflective sensor<br/>           2: Transmissive sensor<br/>           3: Transmissive sensor (when using manual threshold value)<br/>           4: Reflective sensor (when using manual threshold value)</p> <p>* In the case of the compatible mode for the B-SP series,<br/>           Reserved when 3 is specified. (If specified, it is processed as "2.")<br/>           Reserved when 4 is specified. (If specified, it is processed as "1.")</p> <p>d: Reserved area<br/>C, D, E</p> <p>e: Reserved area<br/>1 to 9, A</p> <p>f: Reserved area<br/>0 to 2</p> <p>g: Print orientation and mirror printing<br/>           0: Bottom first printing<br/>           1: Top first printing<br/>           2: Reserved<br/>           3: Reserved</p> <p>* Reserved in the case of the compatible mode for the B-SP series<br/>           (Fixed at 1.)</p> <p>h: Type of status response<br/>           0: No status response<br/>           1: Status response</p> |

Explanation

(1) Number of labels to be issued

- ① If increment/decrement is not specified, the same data will be printed on the designated number of labels.
  - ② If increment/decrement is specified, the designated number of labels will be printed while incrementing/decrementing the designated drawing area one by one.
- \* The increment/decrement designation is effective until the Image Buffer Clear Command ([ESC] C) is transmitted.

(2) Type of sensor

① No sensor:

Printing takes place according to the parameter designated by the Label Size Set Command.

② Reflective sensor:

Printing takes place according to the parameter designated by the Label Size Set Command. However, the black mark provided on the back side of the tag paper is automatically sensed by the reflective sensor and the paper position is finely adjusted for every piece.

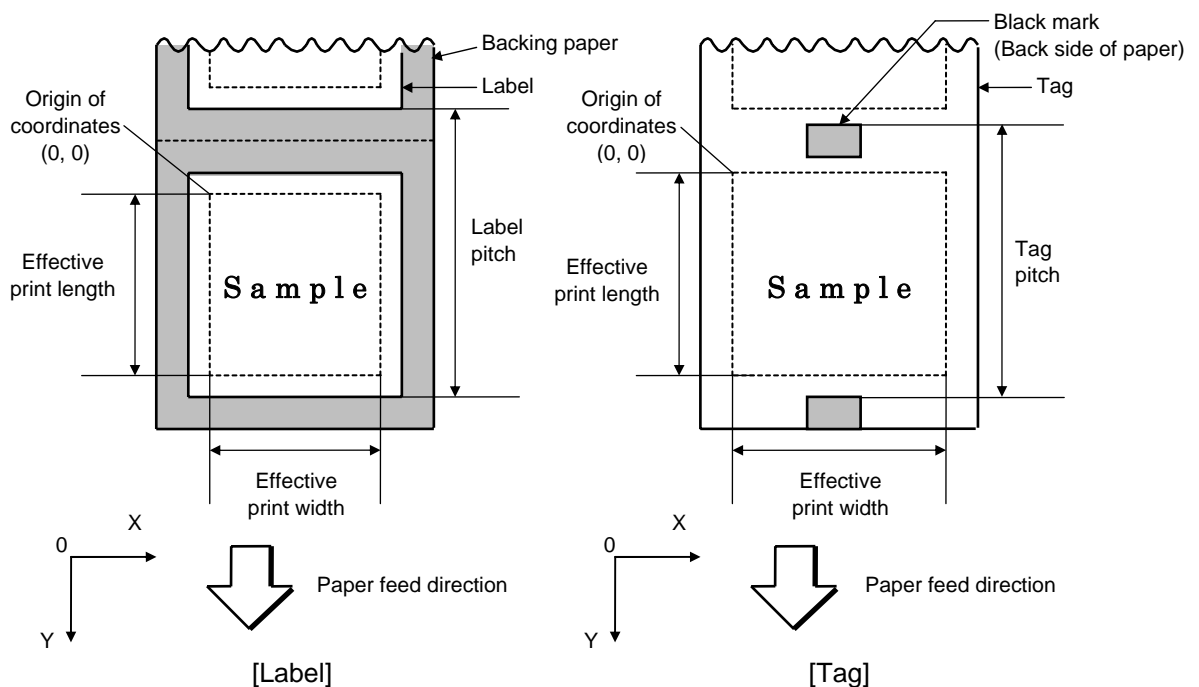
③ Transmissive sensor:

Printing takes place according to the parameter designated by the Label Size Set Command. However, the label-to-label gap is automatically sensed by the transmissive sensor and the paper position is finely adjusted for every piece.

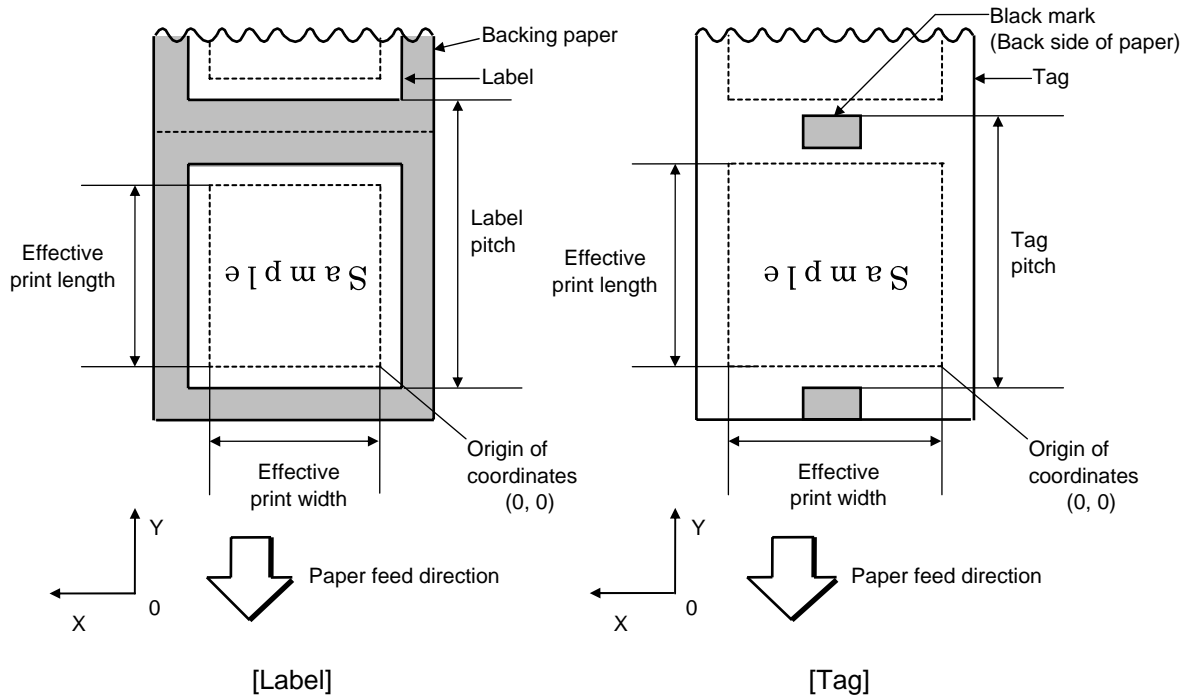
(3) Tag rotation designation

The origin of coordinates and print direction vary according to the designation of tag rotation.

① Bottom first printing



② Top first printing



(4) Status response

When "Status response is returned." is selected, a status response is returned at the end of printing or if an error occurs.

In the batch mode, the print end status response is returned after the designated number of labels is printed.

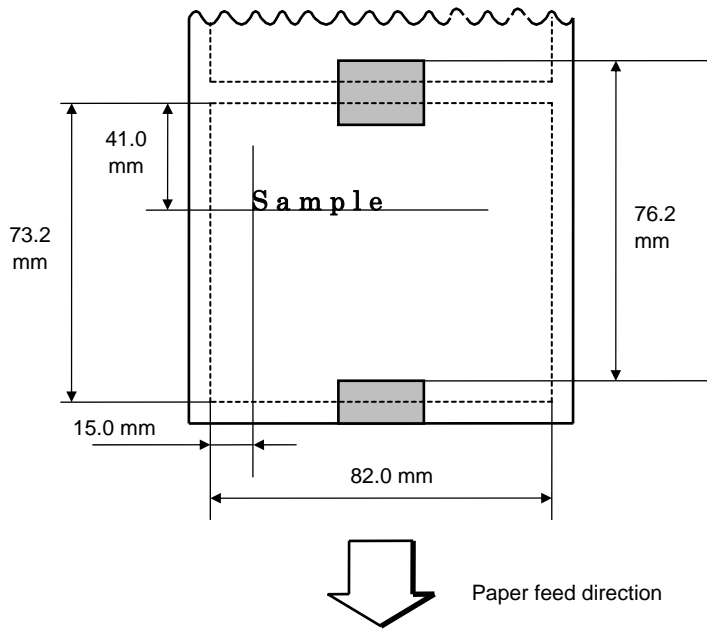
In the strip mode, a status response is returned after one label is printed.

\* Do not change the setting of the status response parameter during printing. Otherwise the status response may not be returned properly.

(5) Reserved area (Omissible)

The described values should be designated to d, e, and f. When any value from 0 to 3 is designated to g, a command error does not occur. However, any value other than 1 should not be designated because it is fixed at 1.

Examples



- Issue count: 4 pieces
- Paper: Tag paper  
(Reflective sensor is used.)
- Issue mode: Cut issue
- Print speed: 4"/sec.
- Status response: On

```
[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C4101 [LF] [NUL]
```



## 5.8.2 FEED COMMAND

[ESC] T

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Feeds the paper.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Format   | [ESC] Tabcde [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Term     | <p>a: Type of sensor</p> <p>0: No sensor</p> <p>1: Reflective sensor</p> <p>2: Transmissive sensor</p> <p>3: Transmissive sensor (when using manual threshold value)</p> <p>4: Reflective sensor (when using manual threshold value)</p> <p>* In the case of the compatible mode for the B-SP series,<br/>Reserved when 3 is specified. (If specified, it is processed as "2.")<br/>Reserved when 4 is specified. (If specified, it is processed as "1.")</p> <p>b: Reserved area<br/>0 to 1</p> <p>c: Reserved area<br/>C, D, E</p> <p>d: Reserved area<br/>1 to 9, A</p> <p>e: Reserved area<br/>0 to 2</p> |

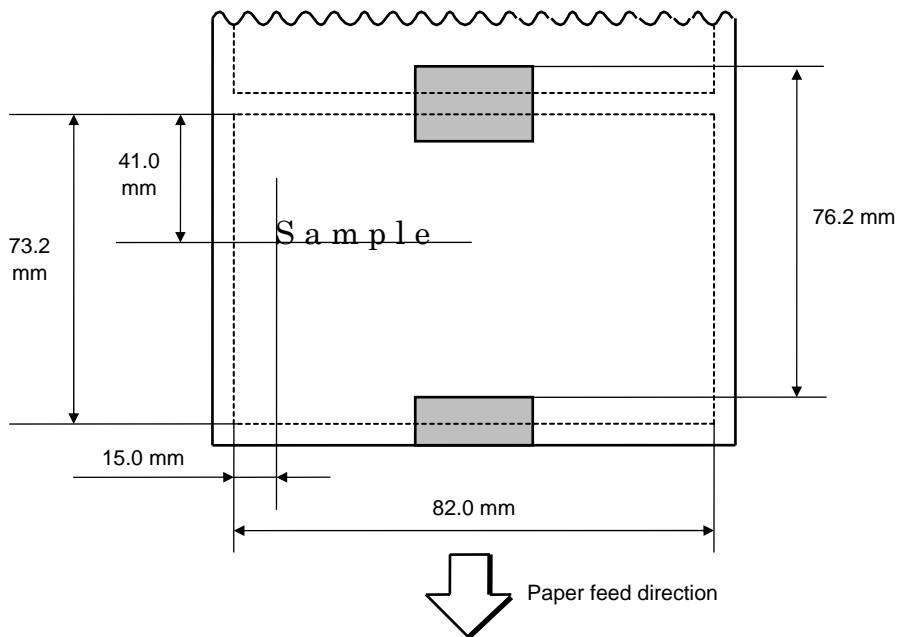
### Explanation

- (1) Type of sensor
- ① No sensor:  
Feeding takes place according to the parameter designated by the Label Size Set Command.
  - ② Reflective sensor:  
Feeding takes place according to the parameter designated by the Label Size Set Command. However, the black mark provided on the back side of the tag paper is automatically sensed by the reflective sensor and the stop position is finely adjusted.
  - ③ Transmissive sensor:  
Feeding takes place according to the parameter designated by the Label Size Set Command. However, the label-to-label gap is automatically sensed by the transmissive sensor and the stop position is finely adjusted.
- (2) When any value other than the above is specified in the reserved area, an error occurs. (When the above value is specified, this command is ignored.)

Notes

- (1) If the label size, type of sensor, feed amount fine adjustment or strip position fine adjustment is changed, the Feed Command must be sent to adjust the print start position prior to printing by feeding one label.
- (2) The parameter of the Feed Command is stored in memory (retained even if the power is turned off).
- (3) When "status response is returned." has been selected using the Issue Command, a status response is returned after the end of feed or when an error occurs.
- (4) Refer to ISSUE COMMAND for the operation to stop the label at the home position.

Examples



```
[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] AX; +010, +000, +10 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C43001 [LF] [NUL]
```

**5.8.3 STORAGE AREA ALLOCATE COMMAND [ESC] XF**

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Allocates the storage area in the flash ROM on the CPU board.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Format   | [ESC] XF; aa, bb, cc (, dd, ee) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Term     | <p>aa: Reserved<br/>00 to 14</p> <p>bb: Size of bit map writable character storage area<br/>00 to 50 (0 KB to 3,200 KB) (in units of 64 KB)</p> <p>cc: Size of BASIC file storage area<br/>00 to 14 (0 KB to 896 KB) (in units of 64 KB)<br/>AA: The current BASIC file storage area and contents are retained.</p> <p>dd: Size of form storage area<br/>(Omissible. If omitted, the contents are retained.)<br/>00 to 14 (0 KB to 896 KB) (in units of 64 KB)</p> <p>ee: Size of graphic storage area<br/>(Omissible. If omitted, the contents are retained.)<br/>00 to 03 (0 KB to 192 KB) (in units of 64 KB)</p> |

**Explanation**

(1) The total capacity of the storage area in flash ROM is variable from 1,024 to 3,200 KB.

\* Variable with the two-byte font installed

|                                     |          |
|-------------------------------------|----------|
| Kanji                               | 1,344 KB |
| Chinese                             | 1,024 KB |
| Korean                              | 2,112 KB |
| Without the two-byte font installed | 3,200 KB |

(2) Allocation priority is assigned as follows:

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| ① All parameters<br>Writable character > BASIC > Form > Graphic > PC save                                         |
| ② Omissible parameters (, dd, ee) are omitted<br>Form > Graphic > Writable character > BASIC > PC save            |
| ③ BASIC is retained (AA)<br>BASIC > Writable character > Form > Graphic > PC save                                 |
| ④ BASIC is retained, or omissible parameters are omitted<br>Form > Graphic > BASIC > Writable character > PC save |

(3) When the above command is received, the entire area in flash ROM on the CPU board is cleared. However, omitted parameters are not cleared.

[Example of allocation]

- ⊙ In case that the size of BASIC file storage area is set in a range of “00” to “14”:
- (1) The storage areas are allocated in the following order of precedence – the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area. After these storage areas are allocated using the above command, the remaining area is used for the PC save area.
  - (2) If the sum of the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area, specified using this command, is the maximum allocable capacity, the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area are allocated as specified, respectively. In this case, however, there is no PC save area.
  - (3) If the sum of the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area, specified using this command, exceeds the maximum allocable capacity, the bit map writable character storage area is allocated as specified with the highest priority. Then, the remaining area is allocated to the BASIC file storage area. If there is still remaining area after the bit map writable character storage area and the BASIC file storage area are allocated, it is used for the form storage area. If there is still remaining area, then it is used for the graphic storage area. There is no PC save area. However, the form storage area and the graphic storage area are omitted, the current area is retained.
  - (4) When “00” (0 KB) is specified for each of the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area, the maximum allocable capacity is used for the PC area. However, the form storage area and the graphic storage area are omitted, the current area is retained.
  - (5) When the maximum allocable capacity is specified for the bit map writable character storage area, the entire storage area is occupied by that area. However, the form storage area and the graphic storage area are omitted, the current area is retained.
  - (6) Any numeric value specified in aa (Reserved) is ignored. However, 2-digit values are possible.

Refer to

- Bit Map Writable Character Command ([ESC] XD)
- Save Start Command ([ESC] XO)
- Flash Memory Format Command ([ESC] J1)
- 2-byte Writable Character Code Range Command ([ESC] XE)

Example

The respective area is set to as follows:  
 Bit map writable character storage area: 512 KB  
 BASIC file storage area: 0 KB  
 Form storage area: 192 KB  
 Graphic storage area: 64 KB  
 (PC save area: 896 KB – 512 KB – 0 KB – 192 KB – 64 KB = 128 KB)  
 Format = [ESC] XF; 00, 08, 00, 03, 01 [LF] [NUL]  
 When “14 (896 KB)” is specified for any of the formats, the entire storage area is occupied by that area.  
 For example, if “14” is specified for the bit map writable character storage area, the entire storage area is used only for the bit map writable character storage area. Any area other than the bit map writable character storage area cannot be allocated.

## 5.9 COMMANDS RELATED TO FORMAT

### 5.9.1 FLASH MEMORY FORMAT COMMAND

[ESC] J1

|          |                                                                                                                                                                                                                                                                           |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Formats (initializes) the flash ROM on the CPU board for storage.                                                                                                                                                                                                         |
| Format   | [ESC] J1; a (, b) [LF] [NUL]                                                                                                                                                                                                                                              |
| Term     | <p>a: Formatting (initializing) range</p> <p>A: PC save area of the flash memory + writable character area</p> <p>B: PC save area of the flash memory</p> <p>C: Writable character storage area of the flash memory</p> <p>b: Reserved area (Omissible)</p> <p>0 to 2</p> |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | <ol style="list-style-type: none"> <li>(1) The storage area of flash memory can be roughly divided into the PC save area and the writable character storage area. They can be formatted (initialized) either separately or at the same time.</li> <li>(2) When using a new flash memory, the area to be used must be formatted (initialized) before the PC interface commands or writable characters are stored.</li> <li>(3) After the flash memory is formatted, the remaining memory capacity is displayed on the LCD.</li> <li>(4) When the already stored data (PC interface commands, writable characters, logos) is stored again, the memory is consumed every time data is stored, unless the Flash Memory Format Command ([ESC] J1) is transmitted.</li> <li>(5) When a label issue operation is performed after the Flash Memory Format Command is sent, the image buffer is automatically cleared.</li> <li>(6) When further storing operation is not continued for about 10 seconds after storing the writable characters, logos and PC interface commands, the printer automatically enters the online mode (label issue operation). In this case, the image buffer is automatically cleared.</li> <li>(7) Reserved area (Omissible)<br/>The reserved parameters are not checked.</li> </ol> |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|       |                                                                                                                                                                                                                                                        |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Notes | <ol style="list-style-type: none"> <li>(1) The writable character storage area is shared between the TPCL mode and the LABEL mode. Therefore, if flash memory is initialized, writable characters stored in the LABEL mode are also erased.</li> </ol> |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|          |                                                                                                                                                                                         |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Refer to | <ul style="list-style-type: none"> <li>• Bit Map Writable Character Command ([ESC] XD)</li> <li>• Save Start Command ([ESC] XO)</li> <li>• Save Terminate Command ([ESC] XP)</li> </ul> |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|         |                           |
|---------|---------------------------|
| Example | [ESC] J1; A, 0 [LF] [NUL] |
|---------|---------------------------|

## 5.10 COMMANDS RELATED TO WRITABLE CHARACTERS

### 5.10.1 2-BYTE WRITABLE CHARACTER CODE RANGE COMMAND [ESC] XE

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets the code range when a 2-byte writable character code is stored in the flash ROM on the CPU board.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Format      | [ESC] XE (xx); a <sub>1</sub> a <sub>1</sub> a <sub>1</sub> a <sub>1</sub> , b <sub>1</sub> b <sub>1</sub> b <sub>1</sub> b <sub>1</sub> , a <sub>2</sub> a <sub>2</sub> a <sub>2</sub> a <sub>2</sub> , b <sub>2</sub> b <sub>2</sub> b <sub>2</sub> b <sub>2</sub> -----, a <sub>n</sub> a <sub>n</sub> a <sub>n</sub> a <sub>n</sub> , b <sub>n</sub> b <sub>n</sub> b <sub>n</sub> b <sub>n</sub> [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Term        | <p>aaaa: First character code for each range<br/>2020 to FFFF (Indicates the hex. data in ASCII code.)</p> <p>bbbb: No. of characters for each range<br/>0001 to 4000 (Indicates the hex. data in ASCII code.)</p> <p>xx: Character type (Omissible)<br/>51<br/>52 to 55 (Reserved)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Explanation | <ol style="list-style-type: none"> <li>(1) For a 2-byte character code such as Kanji, the character code range may be divided into two or more. As the control information area for the unnecessary codes can be deleted by designating the character code range, the capacity of flash memory can be used efficiently.</li> <li>(2) The total number of characters for each range must not exceed 0 x 4,000 (16,384 characters).</li> <li>(3) Up to 2700 ranges can be designated.</li> <li>(4) It is not possible to store the character codes which are not conforming to the setting for this command.</li> <li>(5) The first character code for each area should be sent in the ascending order. The areas must not overlap. If these conditions are not satisfied, the operation is not guaranteed.</li> <li>(6) When any character type of 52 to 55 is specified, it is invalid. However, an error does not occur, instead a blank is printed.</li> </ol> |
| Refer to    | <ul style="list-style-type: none"> <li>• Flash Memory Format Command ([ESC] J1)</li> <li>• Bit Map Writable Character Command ([ESC] XD)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

Example

Shift JIS 8140H to 83DFH:

Character data is present.  
 Character data is not present.

|      | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8140 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| :    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 81F0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| :    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 8240 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| :    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 82F0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| :    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 8340 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| :    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 83D0 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

[ESC] XE; 8140, 00BD, 8240, 00B7, 8340, 00BD [LF] [NUL]

### 5.10.2 BIT MAP WRITABLE CHARACTER COMMAND

[ESC] XD

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Stores writable characters and logos in the flash ROM on the CPU board.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Format   | [ESC] XD; (Sj, ) aa, b, ccc, ddd, eee, fff, ggg, h, iii ----- iii [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Term     | <p>Sj: Reserved area (Omissible)<br/>j: 0 to 2</p> <p>aa: Writable character set<br/>01 to 40<br/>41 16 × 16 (dots)<br/>42 24 × 24 (dots)<br/>43 32 × 32 (dots)<br/>51 2-byte code character<br/>52 to 55 Reserved</p> <p>b(b): Writable character code<br/>20H to FFH (Set in hex.)<br/>40H to 7EH, 80H to FCH (When the writable character set is 41 to 43)<br/>2020H to FFFFH (When the writable character set is 51)</p> <p>ccc: Left offset<br/>000 to 719 (in units of dots)</p> <p>ddd: Top offset<br/>000 to 719 (in units of dots)</p> <p>eee: Character width<br/>001 to 720 (in units of dots)</p> <p>fff: Character height<br/>001 to 720 (in units of dots)</p> <p>ggg: Character-to-character spacing/proportional spacing<br/>000 to 999 (in units of dots)</p> <p>h: Type of writable character data<br/>0: Nibble mode (4 bits/byte)<br/>1: Hex. mode (8 bits/byte)</p> <p>iii ----- iii: Writable character data to be stored</p> |

\* When the writable character type is 41 to 43, left offset, top offset, character width, character height, and character-to-character spacing/proportional spacing are fixed at "000." Any settings are ignored.



Explanation

(1) Type of writable character

Up to 43 types of writable character sets can be stored. However, the maximum number of characters varies depending on the writable character size and number of characters because of the limited memory capacity.

For writable character types 41 to 43, each writable character size is fixed.

If any type of writable character sets out of the range is specified, an error occurs.

When aa is set to 44, an error does not occur. However, writable characters are not stored.

When any writable character type of 52 to 55 is specified, it is invalid. However, an error does not occur, instead a blank is printed.

(2) Character code

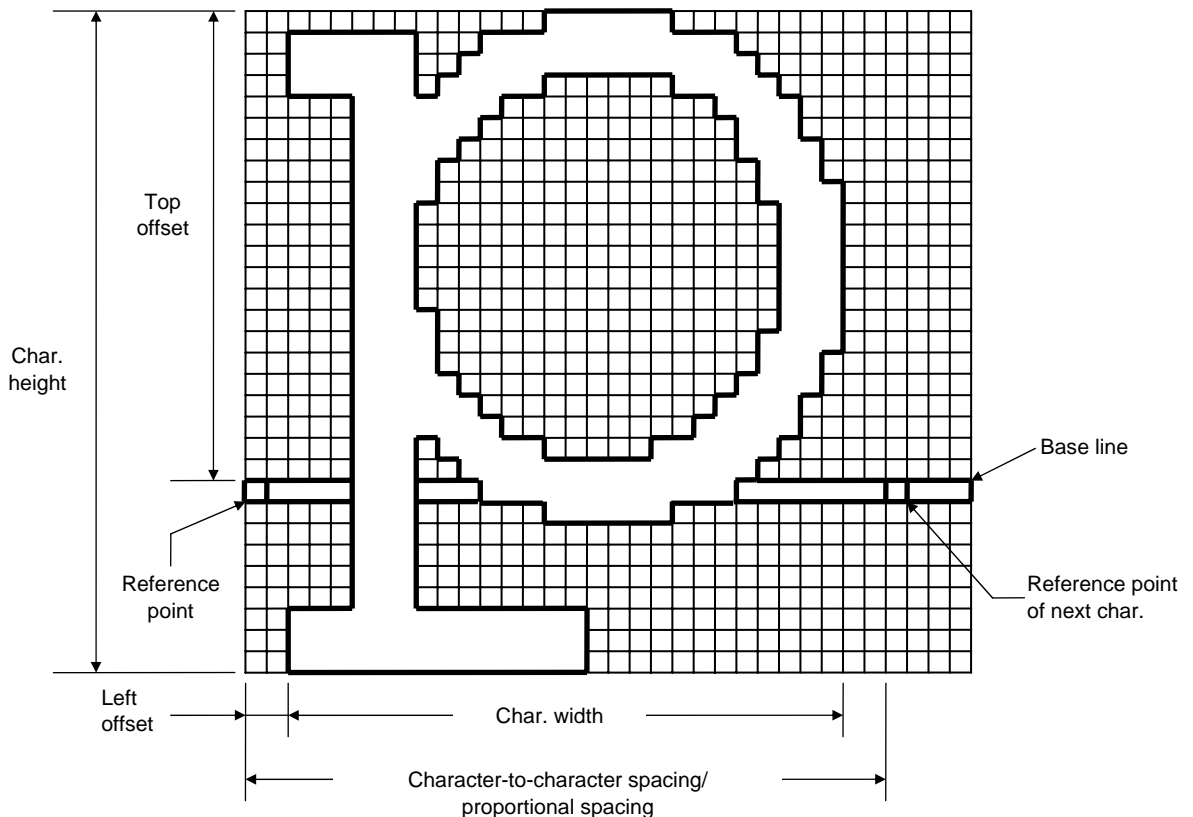
Up to 224 characters can be stored per character set. The maximum number of characters are 40 types × 224 characters = 8960 characters. It varies depending on the writable character size and the number of characters because of the limited memory capacity.

For character sets from 41 to 43, a character code consisting of 1 byte is stored. However, when the character code is read, F0H is added to the upper digit is added to the upper digit, and consists of 2 bytes. In this case, up to 188 characters can be stored per character set.

(3) Reserved area

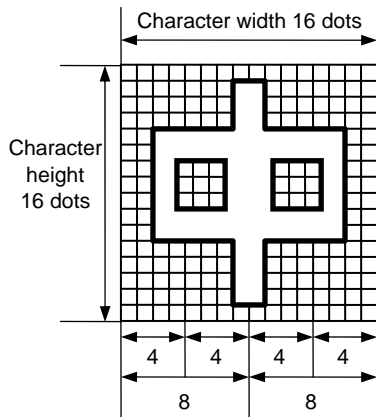
When Sj is set to any value other than 0 to 2, an error occurs.

(4) Each parameter





(6) Writable character type: 41 (16 dots ×16 dots)



| Nibble mode |     |           |     |
|-------------|-----|-----------|-----|
| <b>1</b>    | 30H | <b>2</b>  | 30H |
| <b>3</b>    | 30H | <b>4</b>  | 30H |
| <b>5</b>    | 30H | <b>6</b>  | 31H |
|             |     | <b>7</b>  | 38H |
|             |     | .         |     |
|             |     | .         |     |
|             |     | .         |     |
|             |     | <b>58</b> | 31H |
|             |     | <b>59</b> | 38H |
|             |     | <b>60</b> | 30H |
| <b>61</b>   | 30H | <b>62</b> | 30H |
| <b>63</b>   | 30H | <b>64</b> | 30H |

| Hex. mode |     |           |     |
|-----------|-----|-----------|-----|
| <b>1</b>  | 00H | <b>2</b>  | 00H |
| <b>3</b>  | 01H | <b>4</b>  | 80H |
| <b>5</b>  | 01H | <b>6</b>  | 80H |
|           |     | <b>7</b>  | 01H |
|           |     | .         |     |
|           |     | .         |     |
|           |     | .         |     |
|           |     | <b>26</b> | 80H |
|           |     | <b>27</b> | 01H |
|           |     | <b>28</b> | 80H |
| <b>29</b> | 01H | <b>30</b> | 80H |
| <b>31</b> | 00H | <b>32</b> | 00H |

[Nibble mode]

- (1) The writable character data to be stored is separated into four dot units and sent in above-mentioned order (**1** → **64**). (Upper digit: "3")
- (2) The data of writable characters to be stored is 30H to 3FH.
- (3) The data count of writable characters to be stored should be 64 bytes.

[Hex. mode]

- (1) The writable character data to be stored is separated into eight dot units and sent in above-mentioned order (**1** → **32**).
- (2) The data of writable characters to be stored is 00H to FFH.
- (3) The data count of writable characters to be stored should be 32 bytes.

\* When writable character type 41 is designated, the width and height of the character are both 16 dots.





Notes

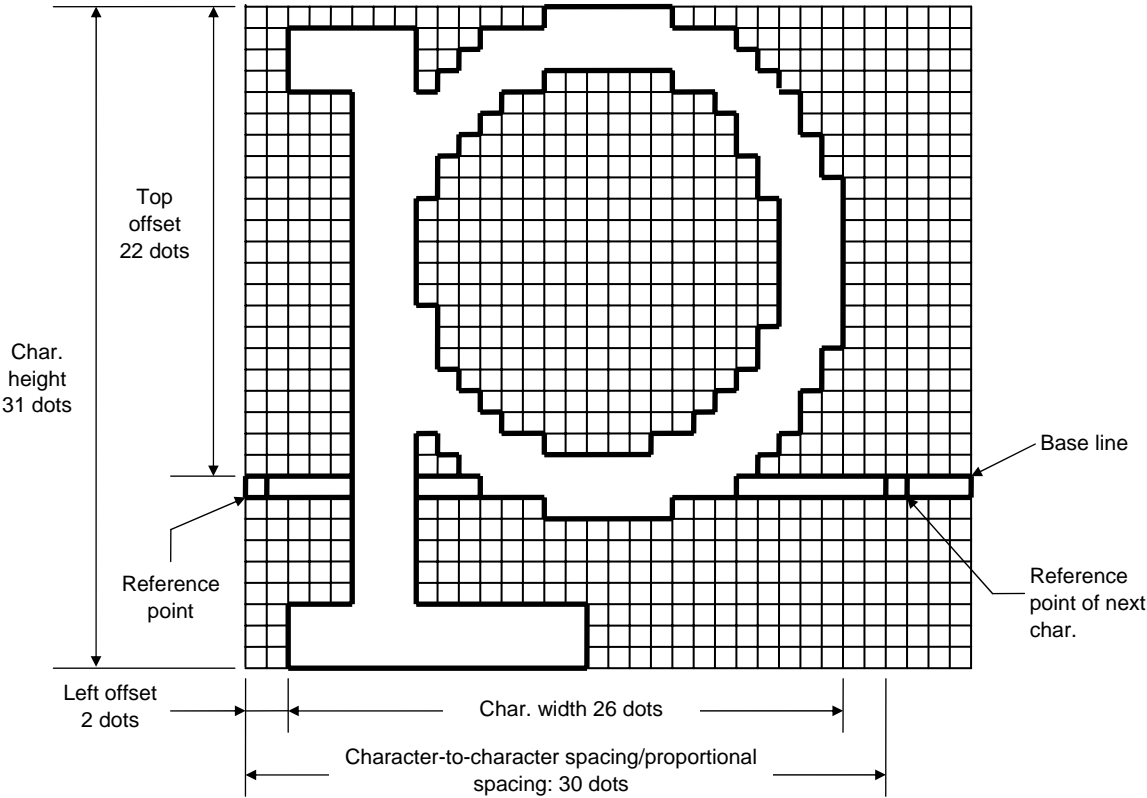
- (1) No matter what character type or character code is selected, no memory will be wasted.
- (2) When a new writable character is stored, the Flash Memory Format Command ([ESC] J1) must be transmitted.
- (3) A character code already stored can be stored in the flash memory again by sending the Bit Map Writable Character Store Command ([ESC] XD, but memory will be consumed each time the code is stored. The memory can be efficiently used if the Flash Memory Format Command ([ESC] J1) is sent in advance.
- (4) Different character width and character height can be designated for the same writable character type, according to the writable character codes. In other words, character size can be changed by each character, thus memory can be saved.
- (5) Proportional spacing and descending characters are possible depending on the parameters of character-to-character spacing/proportional spacing, left offset, and top offset.
- (6) When top offset is 000, the reference coordinate is positioned at the upper left when drawing because the base line is at the top. (Coordinate setting is facilitated for logos.)
- (7) When the flash memory is used, and a label issue operation is performed after the Bit Map Writable Character Command ([ESC] XD) is sent, the image buffer is cleared automatically.
- (8) When further storing operation is not continued for about 10 seconds after storing the writable characters and logos, the printer automatically enters the online mode (label issue operation). In this case, when the flash memory is used, the image buffer is automatically cleared.

Refer to

- Flash Memory Format Command ([ESC] J1)

Examples

Writable character type: 03  
 Writable character code: 70H



```
[ESC] J1; C [LF] [NUL]
[ESC] XD; 03, p, 002, 022, 026, 031, 030, 0, 000?<000?<7??800?<???<00?=?03>001?
<00?001?8007001?0007801>0003801>0003<01<0001<01<0001<01<0001<01<0001<01<0001<01>
0001<01>0003<01>0003801?0007801?800?001?<01?001=?07>001<???<001<7??8001<0?<
0001<0000001<0000001<0000001<000000???<0000???<0000???<0000 [LF] [NUL]
```

- |             |           |
|-------------|-----------|
| * 30H = "0" | 38H = "8" |
| 31H = "1"   | 39H = "9" |
| 32H = "2"   | 3AH = "." |
| 33H = "3"   | 3BH = "," |
| 34H = "4"   | 3CH = "<" |
| 35H = "5"   | 3DH = "=" |
| 36H = "6"   | 3EH = ">" |
| 37H = "7"   | 3FH = "?" |

## 5.11 COMMANDS RELATED TO GRAPHICS

### 5.11.1 GRAPHIC COMMAND

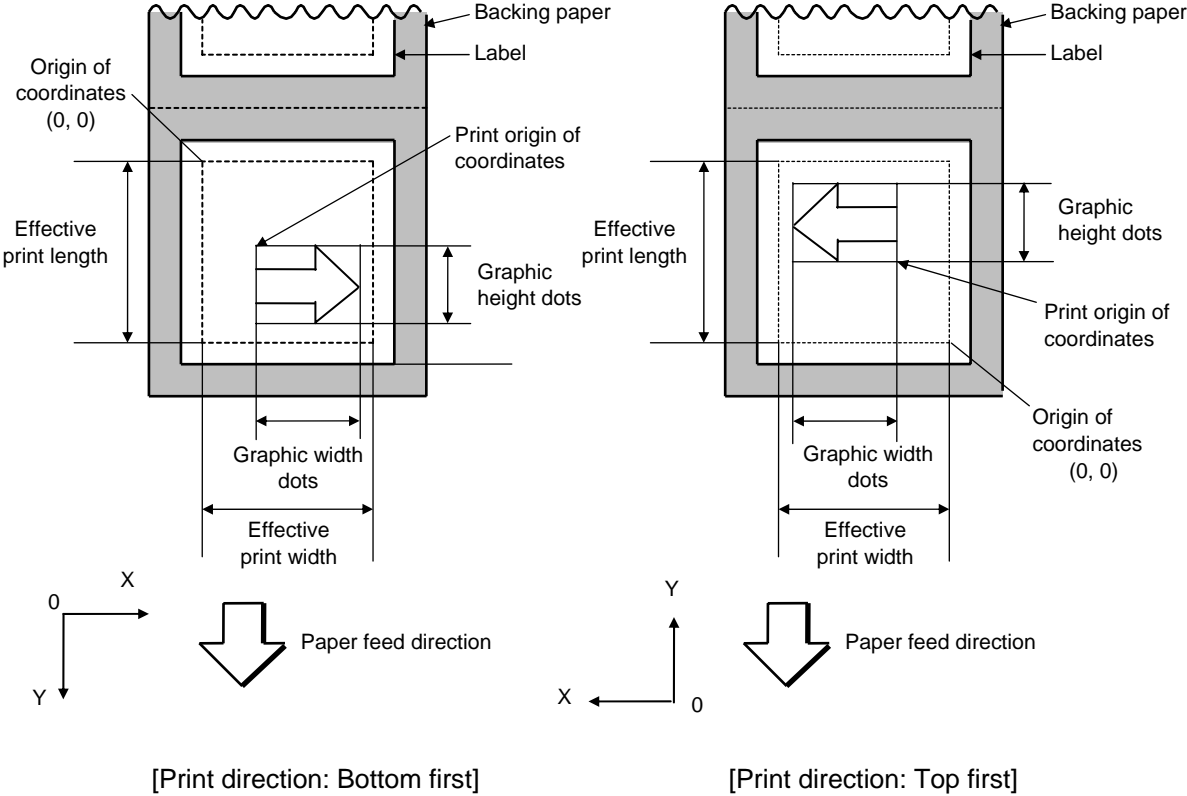
[ESC] SG

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Draws graphic data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format   | [ESC] SG; aaaa(D), bbbb(D), cccc, dddd, e, ggg --- ggg [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Term     | <p>aaaa(D): X-coordinate of the print origin for drawing graphic data<br/>Fixed at 4 digits (in 0.1 mm units)<br/>* If "D" is attached after a 4-digit value, the coordinate is specified in units of dots.<br/>0000D or greater</p> <p>bbbb(D): Y-coordinate of the print origin for drawing graphic data<br/>4 or 5 digits (in 0.1 mm units)<br/>* If "D" is attached after a 4- or 5-digit value, the coordinate is specified in dots.<br/>0000D or greater</p> <p>cccc: No. of graphic width dots<br/>Fixed at 4 digits (in units of dots)<br/>However, when the graphic data "2: BMP file" or "6: PCX file" is selected, this designation is ignored.<br/>(The information of the graphic width is contained in the graphic data.)</p> <p>dddd: No. of graphic height dots<br/>4 or 5 digits (in units of dots)<br/>However, when the graphic data "2: BMP file" or "6: PCX file" is selected, this designation is ignored.<br/>(The information of the graphic width is contained in the graphic data.)<br/>When "3: TOPIX compression mode" is selected for the type of graphic data:<br/>Resolution of graphic data: *only two types<br/>{ 0150: 150 DPI (Draws data in double resolution.)</p> <p>e: Type of graphic data<br/>When the command starts with "[ESC] SG;":<br/>0: Nibble mode (4 dots/byte) Overwrite drawing<br/>1: Hex. mode (8 dots/byte) Overwrite drawing<br/>2: BMP file mode Overwrite drawing<br/>3: TOPIX compression mode Overwrite drawing<br/>4: Nibble mode (4 dots/byte) OR drawing<br/>5: Hex. mode (8 dots/byte) OR drawing<br/>6: PCX file mode Overwrite drawing<br/>7: TOPIX compression mode XOR drawing</p> <p>ggg --- ggg: Graphic data</p> |



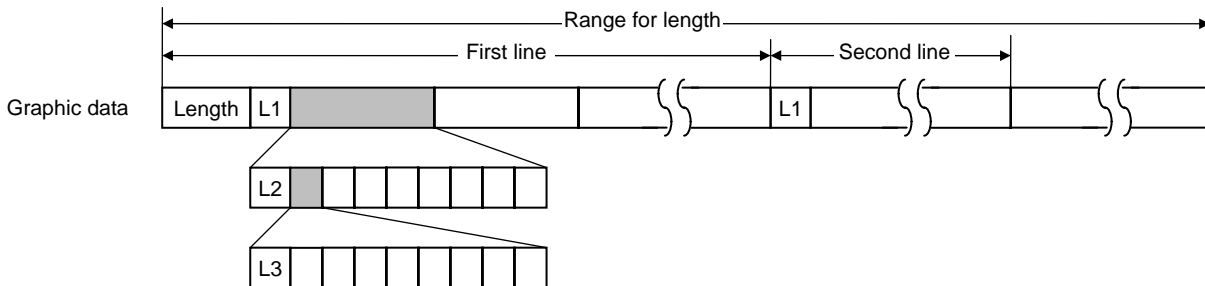
Explanation

- (1) When the graphic data "0," "1," "2," "3" or "6" is selected, the graphic data is drawn by overwriting the image buffer.
- (2) When the graphic data "4" or "5" is selected, the graphic data is drawn by carrying out OR between the graphic data and the data in the image buffer.
- (3) When the graphic data "7" is selected, the graphic data is drawn by carrying out Exclusive-OR between the graphic data and the data in the image buffer.





[TOPIX compression mode]

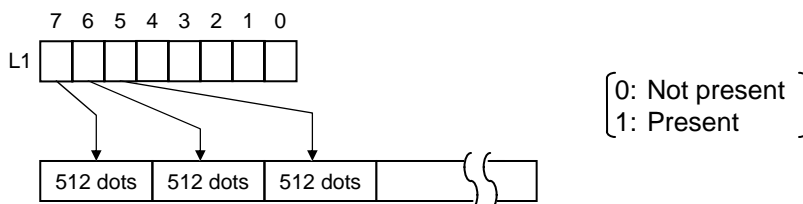


(1) Length: Total number of bytes of the graphic data (0001H ~ )

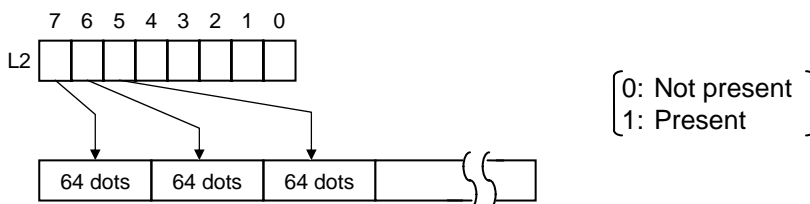
Ex. Length = 20 bytes: 

|    |    |
|----|----|
| 00 | 14 |
|----|----|

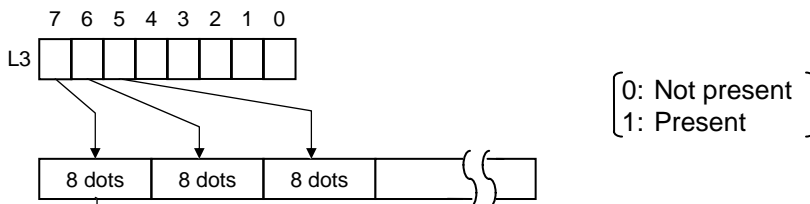
(2) L1 parameter: Shows in which large block (512 dots/block) the changed data is contained.



(3) L2 parameter: Shows in which medium block (64 dots/block) the changed data is contained (of the L1 large block).



(4) L3 parameter: Shows in which small block (8 dots/block) the changed data is contained (of the L2 medium block).



Exclusive-OR is carried out between the current image data and the image data one line previous. Only the changed bit is set to ON (1). The alignment of dots is MSB (left dots) and LSB (right dots).

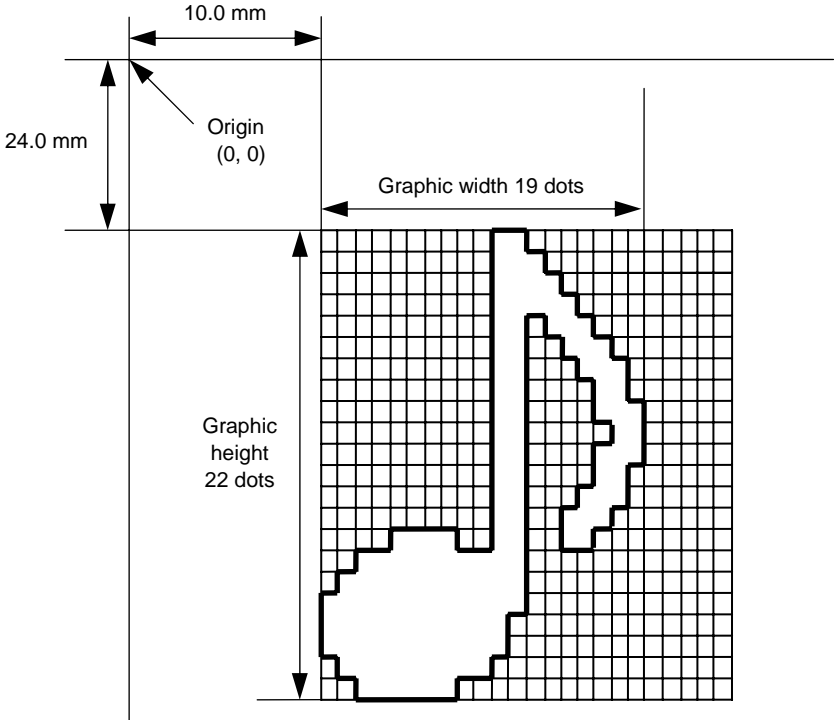
\* The graphic width for only the smaller value of either the designated value or the max. buffer size (512 KB) is drawn.  
The minimum unit of the data drawing is 8 dots (1 byte). If the graphic width is set to 3 dots, it is reset to 8 dots (1 byte).

Notes

- (1) The print origin of coordinates must be set so that the result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D).
- (2) The number of graphic width dots and the number of graphic height dots must also be set so that the result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D) in the same manner as the above.
- (3) Both width and height are 8 dots/mm in case of the 203 dpi-print head model.
- (4) The actual result of drawing may deviate within  $\pm 0.5$  mm in case of the 203 dpi-print head model, in the X direction with respect to the designated print origin of the X-coordinate.

[ To draw the received graphic data at high speed, the data is directly developed in the image buffer without applying correction to each bit with respect to the designated X-coordinate. Consequently, an error of up to 4 bits occurs. ]

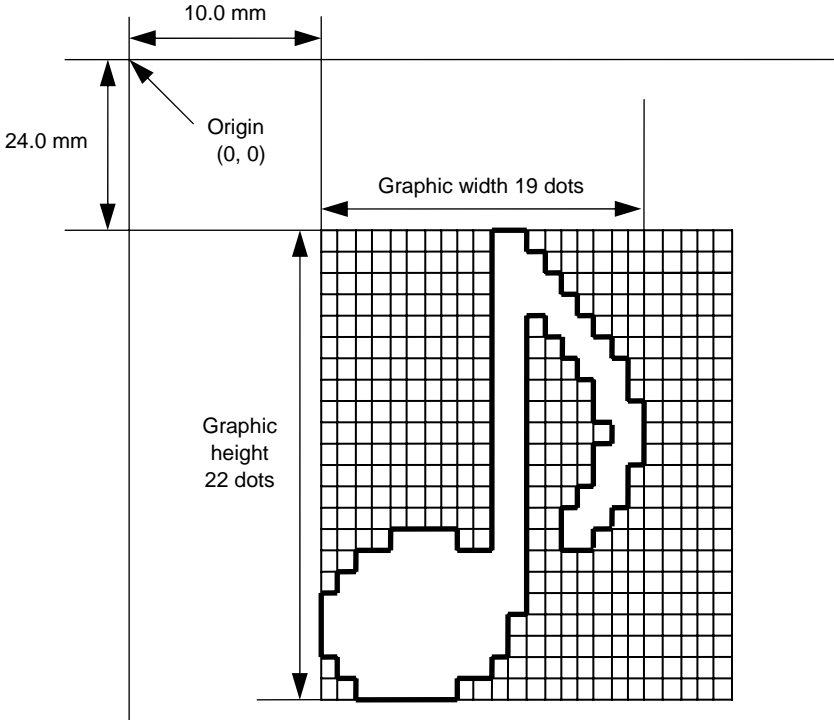
Examples



```
[ESC] C [LF] [NUL]
[ESC] SG; 0100, 0240, 0019, 0022, 0, 003000003800003<00003>000037000033800031
<00030<00030>00030600030>00030<00031<00033800?33003??0007??000??000??
>000??>0007?<0003?0000 [LF] [NUL]
[ESC] XS; I, 0001, 0002C3000 [LF] [NUL]
```

- |             |           |
|-------------|-----------|
| * 30H = "0" | 38H = "8" |
| 31H = "1"   | 39H = "9" |
| 32H = "2"   | 3AH = "." |
| 33H = "3"   | 3BH = "," |
| 34H = "4"   | 3CH = "<" |
| 35H = "5"   | 3DH = "=" |
| 36H = "6"   | 3EH = ">" |
| 37H = "7"   | 3FH = "?" |

[TOPIX compression mode]



```
[ESC] SG; 0100, 0240, 0019, 0300, 3, 00 5C 80 80 40 30
 Length L1 L2 L3 Data (1st line)
80 80 40 08 80 80 40 04 80 80 40 02 80 80 40 09
(2nd line) (3rd line) (4th line) (5th line)
80 80 60 04 80 80 60 02 40 80 80 40 01 80 80 20 20
(6th line) (7th line) (8th line) (9th line)
80 80 20 80 80 80 20 80 80 80 20 20 80 80 40 01
(10th line) (11th line) (12th line) (13th line)
80 80 60 02 40 80 80 A0 0F 80 80 80 C0 30 C3 80 80 80 40
(14th line) (15th line) (16th line) (17th line)
80 80 80 80 80 80 40 10 00 80 80 C0 80 20 80 80 C0 40 C0 [LF] [NUL]
(18th line) (19th line)(20th line) (21st line) (22nd line)
```

## 5.12 COMMANDS RELATED TO PC COMMAND SAVING

### 5.12.1 SAVE START COMMAND

[ESC] XO

|          |                                                                                                                                                      |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Declares the start of saving PC interface commands.<br>(Places the printer in the mode where PC interface commands are written in the flash memory.) |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------|

|        |                                   |
|--------|-----------------------------------|
| Format | [ESC] XO; aa, (Sb, ) c [LF] [NUL] |
|--------|-----------------------------------|

|      |                                                                                                                                                                                                                                                       |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | <p>aa: Identification number to be used for saving in flash memory or reading<br/>01 to 99</p> <p>Sb: Reserved area (Omissible)<br/>b: 0 to 2</p> <p>c: Status response at save time<br/>0: No status response<br/>1: Status response is returned</p> |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Notes | <p>(1) After sending the Save Start Command ([ESC] XO), any command other than the following will be saved into flash memory without being analyzed.</p> <ul style="list-style-type: none"> <li>• Save Start Command ([ESC] XO)</li> <li>• Save Terminate Command ([ESC] XP)</li> <li>• Saved Data Read Command ([ESC] XQ)</li> <li>• Bit Map Writable Character Command ([ESC] XD)</li> <li>• Reset Command ([ESC] WR)</li> <li>• Status Request Command ([ESC] WS, [ESC] FM, [ESC] v)</li> <li>• Flash Memory Format Command ([ESC] J1)</li> <li>• Mode Information Acquire Command ([ESC] WX)</li> <li>• Version Information Acquire Command ([ESC] WV)</li> <li>• Bluetooth Device Address Acquire Command ([ESC] IT)</li> <li>• Strip Sensor Adjust Command ([ESC] AH)</li> <li>• Printer ID Set Command ([ESC] ID)</li> <li>• Mode Select Command ([ESC] M)</li> </ul> <p>(2) No error check is made for the commands when saving them.</p> <p>(3) Up to 64 KB can be saved per a save.</p> <p>(4) The status response when saving the commands is not returned when they end normally but only when an error occurs.</p> |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|          |                                                                                                                                         |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Refer to | <ul style="list-style-type: none"> <li>• Save Terminate Command ([ESC] XP)</li> <li>• Flash Memory Format Command ([ESC] J1)</li> </ul> |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------|

Examples

```
[ESC] J1; B [LF] [NUL]
[ESC] XO; 01, 0 [LF] [NUL]
[ESC] D0508, 0760, 0468 [LF] [NUL]
[ESC] T20C30 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, A, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] XP [LF] [NUL]
[ESC] XP [LF] [NUL]
```



### 5.12.2 SAVE TERMINATE COMMAND

**[ESC] XP**

|          |                                                           |
|----------|-----------------------------------------------------------|
| Function | Declares the termination of saving PC interface commands. |
|----------|-----------------------------------------------------------|

|        |                     |
|--------|---------------------|
| Format | [ESC] XP [LF] [NUL] |
|--------|---------------------|

|      |  |
|------|--|
| Note |  |
|------|--|

- (1) When further storing operation is not continued for about 10 seconds after storing the PC interface commands, the printer enters the online mode (label issue operation). In this case, the image buffer is automatically cleared.

|          |                                                                                 |
|----------|---------------------------------------------------------------------------------|
| Refer to | <ul style="list-style-type: none"><li>• Save Start Command ([ESC] XO)</li></ul> |
|----------|---------------------------------------------------------------------------------|

### 5.12.3 SAVED DATA READ COMMAND

[ESC] XQ

|          |                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Reads PC interface commands saved in flash memory.                                                                                                                                                                                                                                                                                              |
| Format   | [ESC] XQ; aa, (Sb,) c, d [LF] [NUL]                                                                                                                                                                                                                                                                                                             |
| Term     | <p>aa: Identification number of the file to be read from flash memory<br/>01 to 99</p> <p>Sb: Reserved area (Omissible)<br/>b: 0 to 2</p> <p>c: Status response when the data is read<br/>0: No status response<br/>1: Status response is returned</p> <p>d: Automatic read at power on time<br/>L: Automatic read<br/>M: No automatic read</p> |

\* Reserved in the case of the compatible mode for the B-SP series (Fixed at M: No automatic read)

#### Notes

- (1) If the relevant save identification number is not found, an error occurs. However, if no save identification number is found at power on time when the automatic read has been specified, the setting of the automatic read changes to 'No automatic read,' causing no error.
- (2) If a command error is found in the PC interface command that was read by the Saved Data Read Command or the automatic read at power on time, a command error occurs.
- (3) After an error has occurred, the power must be turned off. When the power is turned on again, the setting of the automatic read at power on time changes to 'No automatic read.'
- (4) The printer enters the online mode (label issue operation) when the Save Data Read Command is sent after the Save Terminate Command.
- (5) If any value out of the range is specified, a command error occurs.
- (6) With the wireless LAN-equipped model or Bluetooth-equipped model, although the setting of the automatic read at power on time is set to 'Automatic read,' wireless LAN parameters or BD addresses (by holding down the POWER key at power on) are printed, the automatic read is not performed (V1.0D or later).

#### Refer to

- Save Start Command ([ESC] XO)
- Save Terminate Command ([ESC] XP)

#### Examples

```
[ESC] XQ; 01, 0, L [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 100 [LF] [NUL]
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]
```

## 5.13 COMMANDS RELATED TO CHECK

### 5.13.1 HEAD BROKEN DOTS CHECK COMMAND

[ESC] HD

|          |                                                                                                                                |
|----------|--------------------------------------------------------------------------------------------------------------------------------|
| Function | Checks the thermal head for broken dots.                                                                                       |
| Format   | [ESC] HD001 (, a) [LF] [NUL] --- All thermal elements are checked.                                                             |
| Term     | a: Check result status response (Omissible)<br>A: Status is returned<br>(If omitted, the check result status is not returned.) |

#### Explanation

- (1) The Head Broken Dots Check Command is subject to batch processing. If the Label Issue Command to issue 100 labels is transmitted before the Head Broken Dots Check Command, the head broken dots check will be executed after 100 labels have been issued.
- (2) In case of the all thermal elements check, all thermal elements of the thermal head will be checked.  
However, for the B-EP4DL-GHxx, although an error is detected outside the effective print width area, a head broken elements error is not indicated because the head width is larger than the effective print width.
- (3) When the check result is found to be normal under the condition that the check result status is not returned, the next command is processed. If the check result is found to be abnormal, an error occurs. Whether or not the status is returned when an error occurs depends on the Issue Command setting.

When the check result is found to be normal under condition that the check result status is returned, a status indicating the normal end of the head broken elements check is sent. After that, the next command is processed. If the check result is found to be abnormal, a status indicating the head broken elements error is sent, and then the printer stops.

Status for normal end for other than TEC protocols,

[SOH] [STX] "0020000" [EXT] [EOT] [CR] [LF]

Status for normal end for TEC protocols,

[ACK]

Status for head broken elements error

[SOH] [STX] "1720000" [EXT] [EOT] [CR] [LF]

- (4) The following shows the time to check all thermal elements:

|              |                   |
|--------------|-------------------|
| B-EP2DL-GHxx | Approx. 2 seconds |
| B-EP4DL-GHxx | Approx. 5 seconds |

#### Examples

[ESC] C [LF] [NUL]  
[ESC] RC001; Sample [LF] [NUL]  
[ESC] RC002; 001 [LF] [NUL]  
[ESC] XS; I, 0002, 0002C3000 [LF] [NUL]  
[ESC] HD001 [LF] [NUL]

5.13.2 MESSAGE DISPLAY COMMAND

[ESC] XJ

|             |                                         |
|-------------|-----------------------------------------|
| Function    | Displays the message on the LCD.        |
| Format      | [ESC] XJ; aaa ----- aaa [LF] [NUL]      |
| Term        | aaa ----- aaa: Display data (16 digits) |
| Explanation |                                         |

- (1) When the printer receives the Message Display Command, first it processes the already received data (or completes the label issue if the Issue Command has been sent). Then, it displays the message on the LCD, and finally it enters a pause state.
- (2) When the [PAUSE] key is pressed, the pause state is cleared and the LCD displays the normal message. After the pause state is cleared, the printer resumes processing the data received after the Message Display Command.

Notes

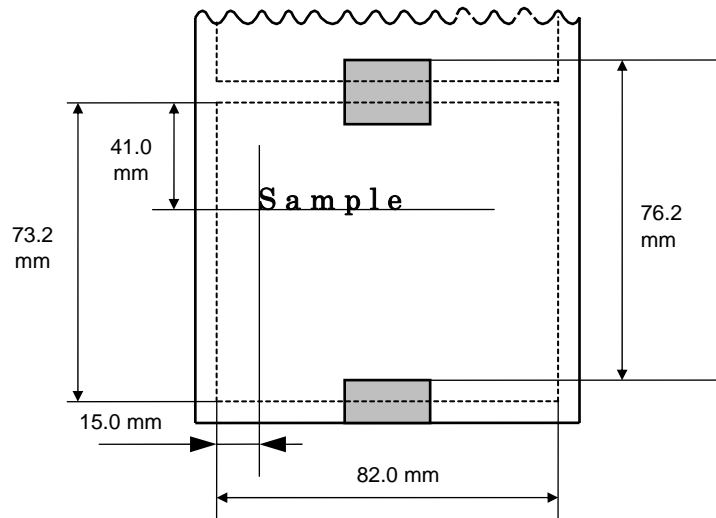
- (1) The number of characters to be displayed is 16. When the display data is less than 16 characters, the blanks are filled with spaces. When the display data exceeds 16 characters, the excess data will be discarded.
- (2) During a pause state, a halt due to an error, or a cover open state, the Message Display Command is not processed even if it is received. In this case, the command is processed after the above state is cleared.
- (3) The following characters can be displayed on the LCD.  
If any character other than the mentioned below is received, “?” is displayed or a command error occurs.

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

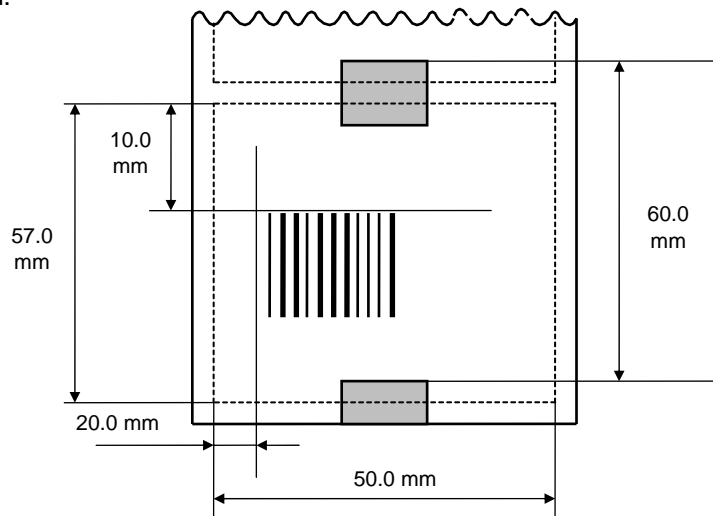
\* The shaded parts are Japanese. They are omitted here.

Examples

- ① Load the paper.
- ② One piece of paper is fed.
- ③ 4 pieces are issued.



- ④ Message, "Please set [Tag]", is displayed.
- ⑤ Change the paper.
- ⑥ Press the [RESTART] key.
- ⑦ One piece of paper is fed.
- ⑧ 2 pieces are issued.



```
[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C4001 [LF] [NUL]
[ESC] XJ; Please set [Tag] [LF] [NUL]
[ESC] D0600, 0500, 0570 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0100, 3, 1, 03, 03, 08, 08, 03, 0, 0150 [LF] [NUL]
[ESC] RB01; 12345 [LF] [NUL]
[ESC] XS; I, 0002, 0011C4001 [LF] [NUL]
```

## 5.14 COMMANDS RELATED TO CONTROL

### 5.14.1 RESET COMMAND

[ESC] WR

**Function** Returns the printer to its initial state.

**Format** [ESC] WR [LF] [NUL]

**Explanation**

- (1) The printer is returned to the same state as when the power is turned on.
- (2) When the printer receives this command during printing, it is initialized after issuing the label which is being printed.
- (3) After the Initialize Command is sent (or after printing is completed, if printing is performed), the next command must not be sent within approximately 30 seconds on the wireless LAN model or within approximately 5 seconds on other models, because the printer is initialized. In IrDA: TEC Protocol, if ACK/status transmission is specified by the Issue Command, the printer returns an ACK, which indicates the command process end, to the EOT after the printer is initialized. In RS-232C, when the status response is specified, the printer returns the status (34H 30H). After this status is received, the next command may be sent. In IrDA: IrCOMM, IrDA: IrOBEX, USB, Bluetooth or Wireless LAN, the printer does not return the status.
- (4) When this command is sent through the IrDA interface, only this command should be sent. After the command is sent, the link should be terminated. Even if the host does not terminate the link, the printer performs the termination process. Therefore, after initialization is completed, the host should establish the link again.
- (5) When receiving this command during data transmission, the printer is initialized after completing the transmission.

**Notes**

- (1) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the SYSTEM mode.
- (2) After the code of the Bit Map Writable Character Command ([ESC] XD) or the Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specifying the type of data.

**Example** [ESC] WR [LF] [NUL]

### 5.14.2 BATCH RESET COMMAND

**[ESC] Z0** <sup>(zero)</sup>

|          |                     |
|----------|---------------------|
| Function | Resets the printer. |
|----------|---------------------|

|        |                     |
|--------|---------------------|
| Format | [ESC] Z0 [LF] [NUL] |
|--------|---------------------|

|             |
|-------------|
| Explanation |
|-------------|

- (1) This command will not be executed until the printer enters an idle state.

## 5.15 COMMANDS RELATED TO STATUS

### 5.15.1 STATUS REQUEST COMMAND

[ESC] WS, [ESC] FM, [ESC] v

**Function** Sends the printer status to the host computer.

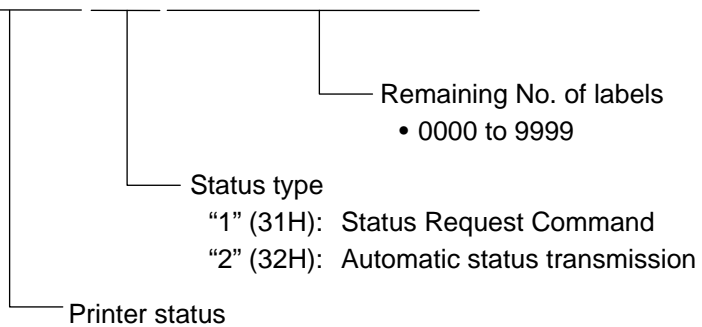
**Format** [ESC] WS [LF] [NUL]  
[ESC] FM [LF] [NUL]  
[ESC] v

**Explanation**

- (1) This command makes the printer send its status regardless of the setting of the status response parameter. The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted.

[IrDA: TEC Protocol]

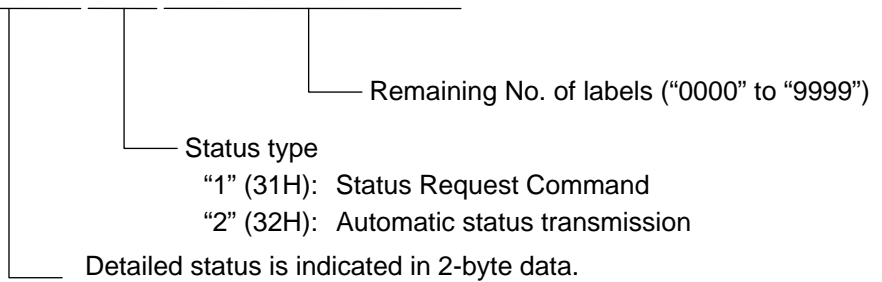
| STX | Printer ID |     | Status |     |     | Remaining No. of labels |     |     |     | CRC |     |
|-----|------------|-----|--------|-----|-----|-------------------------|-----|-----|-----|-----|-----|
| 02H | xxH        | xxH | 3xH    | 3xH | 3xH | 3xH                     | 3xH | 3xH | 3xH | xxH | xxH |





[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Status |     |     | Remaining No. of labels |     |     |     | ETX | EOT | CR  | LF  |
|-----|-----|--------|-----|-----|-------------------------|-----|-----|-----|-----|-----|-----|-----|
| 01H | 02H | 3xH    | 3xH | 3xH | 3xH                     | 3xH | 3xH | 3xH | 03H | 04H | 0DH | 0AH |



- "00": Normal state
- "01": Cover open state
- "02": Operating
- "04": Pause state
- "05": Wait for strip
- "06": Command syntax error (including Ir packet error)
- "09": Normal issue end + Label end
- "11": Paper jam
- "13": Label end
- "15": Cover open error
- "17": Broken head dots error
- "18": Thermal head excessive temperature
- "19": Ambient temperature error
- "32": Abnormal battery temperature
- "33": Battery excessive temperature
- "36": Low battery
- "37": Charging error
- "39": Bluetooth setup error (including initialization error)
- ("40": Normal issue end) Response status for automatic status transmission
- ("41": Normal feed end) Response status for automatic status transmission
- "45": Wait for battery recovery
- "46": Wait for head temperature reduction
- "47": Wait for motor temperature reduction
- "50": Flash ROM write error
- "51": Flash ROM erase error
- "54": Flash ROM storage area full state
- "55": Writable character/PC command save mode

Detailed status in the compatible mode for the B-SP series

- "00": Normal state
- "01": Cover open state
- "02": Operating  
(including wait for strip, pause state, wait for battery recovery, wait for head temperature reduction, wait for motor temperature reduction, writable character/PC command save mode)
- "06": Command syntax error (including Ir packet error)
- "09": Normal issue end + Label end
- "11": Paper jam
- "13": Label end
- "15": Cover open error
- "17": Broken head dots error
- "18": Thermal head excessive temperature  
(including ambient temperature error, abnormal battery temperature, battery excessive temperature)
- "36": Low battery
- "37": Charging error
- "39": Bluetooth setup error (including initialization error)
- ("40": Normal issue end) Response status for automatic status transmission
- ("41": Normal feed end) Response status for automatic status transmission
- "50": Flash ROM write error
- "51": Flash ROM erase error
- "54": Flash ROM storage area full state

Notes

- (1) The status is returned only to the interface which sent this command.
- (2) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specified for the type of data.
- (3) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends a status.
- (4) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec., the printer may fail to receive it.
- (5) The status "09" is valid only when the compatible mode for the B-SP series is enabled in the SYSTEM mode. In a mode other than the compatible mode, it indicates the label end.

Example

[ESC] WS [LF] [NUL]

### 5.15.2 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND [ESC] WB

**Function** Sends information on the printer status and the free space of the receive buffer to the host.

**Format** [ESC] WS [LF] [NUL]

**Explanation**

- (1) This command makes the printer send information on its status and free space of the receive buffer, regardless of the setting of the Status Response parameter.
- (2) The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted.
- (3) Free space of the receive buffer for the interface which sent this command, is returned to the host.

[IrDA: TEC Protocol] Data to be transmitted (fixed at 22 bytes)

| STX | Printer ID |     | Status | Remaining No. of labels |     |     |     | Length |     |
|-----|------------|-----|--------|-------------------------|-----|-----|-----|--------|-----|
| 02H | 3xH        | 3xH | 33H    | 3xH                     | 3xH | 3xH | 3xH | 32H    | 32H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CRC |     |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | xxH | xxH |

[IrDA: IrCOMM, IrDAIr: OBEX, USB, RS-232C, Bluetooth, Wireless LAN]

Data to be transmitted (fixed at 23 bytes)

| SOH | STX | Printer status |     | Status type | Remaining No. of labels |     |     |     | Length |     |
|-----|-----|----------------|-----|-------------|-------------------------|-----|-----|-----|--------|-----|
| 01H | 02H | 3xH            | 3xH | 33H         | 3xH                     | 3xH | 3xH | 3xH | 32H    | 33H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CR  | LF  |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | 0DH | 0AH |

Printer status.....Printer status is indicated in 2-byte data.

- "00": Normal state
- "01": Cover open state
- "02": Operating
- "04": Pause state
- "05": Wait for strip
- "06": Command syntax error (including Ir packet error)
- "09": Normal issue end + Label end
- "11": Paper jam
- "13": Label end
- "15": Cover open error
- "17": Broken head dots error
- "18": Thermal head excessive temperature
- "19": Ambient temperature error
- "32": Abnormal battery temperature
- "33": Battery excessive temperature
- "36": Low battery
- "37": Charging error
- "39": Bluetooth setup error (including initialization error)
- "45": Wait for battery recovery
- "46": Wait for head temperature reduction
- "47": Wait for motor temperature reduction
- "50": Flash ROM write error
- "51": Flash ROM erase error
- "54": Flash ROM storage area full state
- "55": Writable character/PC command save mode

Remaining No. of labels: Indicates the remaining number of labels in four bytes.  
"0000" to "9999"

Length: Indicates the number of bytes of the entire status data  
IrDA: TEC Protocol: Fixed at "22."  
IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232,  
Bluetooth or wireless LAN: Fixed at "23."

Receive buffer free space: Indicates the free space of the receive buffer.

Entire receive buffer free space: Indicates the entire free space of the receive buffer.  
Fixed at "00512."

CRC/CR, LF: Indicates the end of the status block.

Notes

- (1) The status is returned only to the interface which sent this command.
- (2) The printer returns the same status, regardless of whether or not the compatible mode for the B-SP series is set.
- (3) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specified for the type of data.
- (4) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends a status.
- (5) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec., the printer may fail to receive it.

Example

[ESC] WB [LF] [NUL]

**5.15.3 MODE INFORMATION ACQUIRE COMMAND**

**[ESC] WX**

**Function** Sends the printer mode information to the host.

**Format** [ESC] WX [LF] [NUL]

**Explanation**

- (1) The status when the compatible mode for the B-SP series is on differs from the status when the compatible mode is off.
- (2) The mode information format to be sent to the host, is as follows:

- When the compatible mode for the B-SP series is off.

TPCL mode (Mode = A)

Batch issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | T                           | P   | C   | L   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |
| 02H | 54H                         | 50H | 43H | 4CH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | T                           | P   | C   | L   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |     |
| 01H | 02H | 54H                         | 50H | 43H | 4CH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

Strip issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | T                           | P   | C   | L   | SP  | (   | S   | )   | SP  | SP  | SP  | SP  | SP  |     |     |
| 02H | 54H                         | 50H | 43H | 4CH | 20H | 28H | 53H | 29H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | T                           | P   | C   | L   | SP  | (   | S   | )   | SP  | SP  | SP  | SP  | SP  |     |     |     |     |
| 01H | 02H | 54H                         | 50H | 43H | 4CH | 20H | 28H | 53H | 29H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

TPCL1 mode (Mode = B)

Batch issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | T                           | P   | C   | L   | 1   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 54H                         | 50H | 43H | 4CH | 2DH | 4CH | 45H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |     |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | T                           | P   | C   | L   | 1   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |     |     |
| 01H | 02H | 54H                         | 50H | 43H | 4CH | 31H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

Strip issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | T                           | P   | C   | L   | 1   | (   | S   | )   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 54H                         | 50H | 43H | 4CH | 31H | 28H | 53H | 29H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |     |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | T                           | P   | C   | L   | 1   | (   | S   | )   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |     |     |
| 01H | 02H | 54H                         | 50H | 43H | 4CH | 31H | 28H | 53H | 29H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

The above is an example where the message is received in the TPCL and TPCL-LE modes as well as when the compatible mode for the B-SP series is off. In addition, the following messages are returned.

|                                                     |                                                             |               |
|-----------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                           | TPCL                                                        |               |
| TPCL1 mode                                          | TPCL1                                                       |               |
| LABEL mode                                          | LABEL                                                       |               |
| RECEIPT mode                                        | RECEIPT                                                     |               |
| RECEIPT1 mode                                       | RECEIPT1                                                    |               |
| ESC/POS mode                                        | ESC/POS                                                     |               |
| Online reset menu                                   | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys         | USER ■ SYSTEM                                               |               |
| SYSTEM mode for administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                     | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                     | When the password setting is off                            | SYSTEM        |
| TPCL (strip issue mode)                             | TPCL ■ (S)                                                  |               |
| TPCL1 (strip issue mode)                            | TPCL1 (S)                                                   |               |
| LABEL (strip issue mode)                            | LABEL (S)                                                   |               |

\* ■ indicates a space.

- When the compatible mode for the B-SP series is on.  
TPCL mode (Mode = A)  
Batch issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | T                           | P   | C   | L   | -   | L   | E   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 54H                         | 50H | 43H | 4CH | 2DH | 4CH | 45H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |     |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | T                           | P   | C   | L   | -   | L   | E   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |     |     |
| 01H | 02H | 54H                         | 50H | 43H | 4CH | 2DH | 4CH | 45H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

TPCL mode (Mode = B)

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | T                           | P   | C   | L   | -   | L   | E   | 1   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 54H                         | 50H | 43H | 4CH | 2DH | 4CH | 45H | 31H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |     |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     | T                           | P   | C   | L   | -   | L   | E   | 1   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |     |     |
| 01H | 02H | 54H                         | 50H | 43H | 4CH | 2DH | 4CH | 45H | 31H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

The above is an example where the message is received in the TPCL and TPCL-LE modes as well as when the compatible mode for the B-SP series is on. In addition, the following messages are returned.

|                                                     |                                                             |               |
|-----------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                           | TPCL-LE                                                     |               |
| TPCL1 mode                                          | TPCL-LE1                                                    |               |
| LABEL mode                                          | LABEL                                                       |               |
| RECEIPT mode                                        | RECEIPT                                                     |               |
| RECEIPT1 mode                                       | RECEIPT1                                                    |               |
| ESC/POS mode                                        | ESC/POS                                                     |               |
| Online reset menu                                   | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys         | USER ■ SYSTEM                                               |               |
| SYSTEM mode for administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                     | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                     | When the password setting is off                            | SYSTEM        |

\* ■ indicates a space.

Example [ESC] WX [LF] [NUL]



**5.15.4 VERSION INFORMATION ACQUIRE COMMAND [ESC] WV**

**Function** Sends information such as the program version of the printer.

**Format** [ESC] WV [LF] [NUL]

**Explanation**

- (1) The format of the program version data to be returned to the host is as follows.

[IrDA: TEC Protocol] (24-byte data in total)

|               |     |     |                                                                                                                      |
|---------------|-----|-----|----------------------------------------------------------------------------------------------------------------------|
| STX           |     | 02H |                                                                                                                      |
| Creation date | "0" | 30H | Creation date of the program:<br>9-byte data indicated in order of Day-<br>Month-Year                                |
|               | "4" | 34H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "R" | 52H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "8" | 38H |                                                                                                                      |
| Model         | "B" | 42H | Model:<br>7-byte ASCII code indicating the model<br>B-EP2DG (2-inch/203-dpi model)<br>B-EP4DG (4-inch/203-dpi model) |
|               | "_" | 2DH |                                                                                                                      |
|               | "E" | 45H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "D" | 44H |                                                                                                                      |
|               | "G" | 47H |                                                                                                                      |
| Version       | "V" | 56H | Program version:<br>5-byte data: Vx.xx<br>└── Revision<br>└── Version                                                |
|               | "1" | 31H |                                                                                                                      |
|               | "." | 2EH |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
| CRC           |     | xxH |                                                                                                                      |
| CRC           |     | xxH |                                                                                                                      |

[IrDA: IrCOMM, IrDA: IrOBEX, RS-232C, Bluetooth, Wireless LAN]  
(24-byte data in total)

|               |     |     |                                                                                                                      |
|---------------|-----|-----|----------------------------------------------------------------------------------------------------------------------|
| SOH           |     | 01H |                                                                                                                      |
| STX           |     | 02H |                                                                                                                      |
| Creation date | "0" | 30H | Creation date of program:<br>9 bytes of data indicated in order of Day-<br>Month-Year                                |
|               | "4" | 34H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "R" | 52H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "8" | 38H |                                                                                                                      |
| Model         | "B" | 42H | Model:<br>7-byte ASCII code indicating the model<br>B-EP2DG (2-inch/203-dpi model)<br>B-EP4DG (4-inch/203-dpi model) |
|               | "_" | 2DH |                                                                                                                      |
|               | "E" | 45H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "D" | 44H |                                                                                                                      |
|               | "G" | 47H |                                                                                                                      |
| Version       | "V" | 56H | Program version:<br>5 bytes of data: Vx.xx<br>└── Revision<br>└── Version                                            |
|               | "1" | 31H |                                                                                                                      |
|               | "." | 2EH |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
| ETX           |     | 03H |                                                                                                                      |
| EOT           |     | 04H |                                                                                                                      |
| CR            |     | 0DH |                                                                                                                      |
| LF            |     | 0AH |                                                                                                                      |

Notes

- (1) This command is processed in order of receipt. This command is not processed until the processing of the commands sent prior to this command is completed. Therefore, if this command is sent while the printer is in the state other than idle, the program version data may not be returned immediately.
- (2) The USB does not return a status.

**5.15.5 PRINTER SERIAL NUMBER ACQUIRE COMMAND [ESC] WY**

**Function** Sends the printer serial number to the host.

**Format** [ESC] WY [LF] [NUL]

**Explanation**

- (1) The format of the printer serial No. to be returned to the host is as follows.

[IrDA: TEC Protocol]

|     |                    |     |     |
|-----|--------------------|-----|-----|
| STX | Printer serial No. | CRC | CRC |
| 02H | 32 bytes           | XXH | XXH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |     |                    |     |     |     |     |
|-----|-----|--------------------|-----|-----|-----|-----|
| SOH | STX | Printer serial No. | ETX | EOT | CR  | LF  |
| 01H | 02H | 32 bytes           | 03H | 04H | 0DH | 0AH |

When the printer serial No. is "2308M000001":

[32H][33H][30H][38H][4DH][30H][30H][30H][30H][30H][31H][00H][00H][00H][00H][00H]  
 2 3 0 8 M 0 0 0 0 0 0 1  
 [00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H]

\* The remaining bytes of 32 bytes are filled with 00H.

**Example** [ESC] WY [LF] [NUL]

## 5.16 COMMANDS RELATED TO BLUETOOTH AND WIRELESS LAN

### 5.16.1 DEVICE ADDRESS ACQUIRE COMMAND

[ESC] IT

**Function** Reads the device address of the Bluetooth or MAC address of the wireless LAN.

**Format** [ESC] IT [LF] [NUL]

**Explanation**

- (1) This command reads the device address of the Bluetooth or MAC address of the wireless LAN. When using the IrDA: TEC Protocol, the following information field is placed in the information frame and sent in packets.

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Bluetooth device address | CRC |     |
|-----|--------------------------|-----|-----|
| 02H | 12 bytes                 | xxH | xxH |

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN is used]

| SOH | STX | Bluetooth device address | ETX | EOT | CR  | LF  |
|-----|-----|--------------------------|-----|-----|-----|-----|
| 01H | 02H | 12 bytes                 | 03H | 04H | 0DH | 0AH |

The printer sends the following information:

Bluetooth device address: 0015b5aa0005

Wireless LAN MAC address: 000940387630

Bluetooth device address:

[30H] [30H] [31H] [35H] [62H] [35H] [61H] [61H] [30H] [30H] [30H] [35H]  
0 0 1 5 b 5 a a 0 0 0 5

Wireless LAN MAC address:

[30H] [30H] [30H] [39H] [34H] [30H] [33H] [38H] [37H] [36H] [33H] [30H]  
0 0 0 9 4 0 3 8 7 6 3 0

**Example** [ESC] IT [LF] [NUL]

### 5.16.2 BLUETOOTH RELATED PARAMETER ACQUIRE COMMAND [ESC] WT

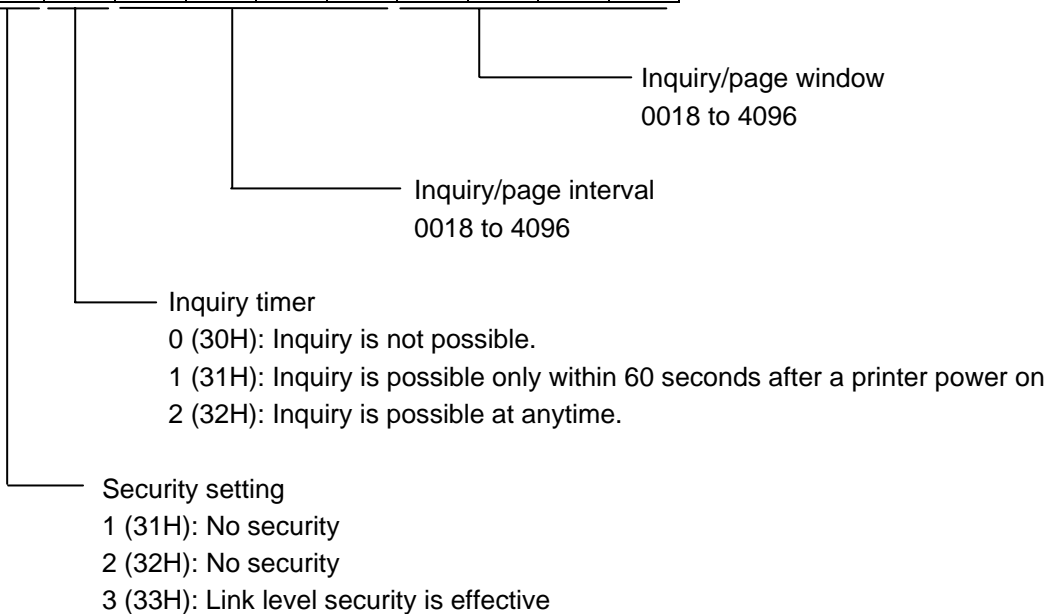
**Function** Acquires the parameters related to the Bluetooth.

**Format** [ESC] WT [LF] [NUL]

**Explanation** (1) This command reads the parameters related to the Bluetooth. When using the IrDA: TEC Protocol, the following information field is placed in the information frame and sent in packets to the host.

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |



| Bluetooth device name | CRC |     |
|-----------------------|-----|-----|
| 32 bytes              | xxH | xxH |

Bluetooth device name: Fixed at 32 bytes

When the Bluetooth device name is "TOSHIBATEC BT,"

[54H] [4FH] [53H] [48H] [49H] [42H] [41H] [20H] [54H] [45H] [43H] [20H] [42H] [54H] [00H] [00H]  
T O S H I B A ' T E C ' B T  
[00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H]

\* When the Bluetooth device name is less than 32 bytes, the remaining bytes are filled with 00H.

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN is used]

| SOX | STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 01H | 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |

| Bluetooth device name | ETX | EOT | CR  | LF  |
|-----------------------|-----|-----|-----|-----|
| 32 bytes              | 03H | 04H | 0DH | 0AH |

## 6. LABEL MODE (INTERFACE COMMANDS)

### 6.1 GENERAL DESCRIPTION

This chapter describes details regarding the interface commands for the LABEL mode of the issue mode.

<<Up to V1.0C>>

There are three issue types, "Batch issue," "Strip issue" and "Linerless issue." When the back feed amount fine adjustment is omitted in the Position Fine Adjust Command in batch issues, regardless of the selected sensor type, printing is started at 5 mm of from the leading edge of the label. When the back feed amount fine adjustment is set, printing is started at 3 mm from the leading edge of the label. Although the back feed amount fine adjustment is set in strip issues, no back feed is performed.

<<V1.0E or later>>

There are three issue types, "Batch issue," "Strip issue" and "Linerless issue."

When the back feed amount fine adjustment is omitted in the Position Fine Adjust Command in batch issues, regardless of the selected sensor type, printing is started at 5 mm of from the leading edge of the label. When the back feed amount fine adjustment is set, printing is started at 3 mm from the leading edge of the label.

In batch issue mode when the type of sensor is designated, whether or not to perform a back feed under the following conditions:

|                                                                                                      | Back feed restriction setting in the SYSTEM mode or in the Setup Command |                            |
|------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------|
|                                                                                                      | ON                                                                       | OFF                        |
| Label pitch of less than 20.0 mm                                                                     | Performs no back feed                                                    | Performs a back feed       |
| Label pitch of 20.0 mm or more but less than 24.0 mm and effective print length of less than 15.0 mm | Performs no back feed                                                    | Performs a back feed       |
| Label pitch of 20.0 mm or more but less than 24.0 mm and effective print length of 15.0 mm or more   | Performs a back feed                                                     | Performs a back feed       |
| Label pitch of 24.0 mm or more                                                                       | Performs a back feed                                                     | Performs a back feed       |
| Feeding by the FEED key or in the Feed Command                                                       | Performs no back feed (*1)                                               | Performs no back feed (*1) |

\*1 However, when the label pitch length is equal to the distance between the head and sensor (11.5 mm) or less, a back feed is performed.

In batch and linerless issue modes when the type of sensor is not designated, a back feed operation is specified depending on the back feed restriction setting in the SYSTEM mode or in the Setup Command.

When the back feed restriction setting is on and the label pitch or effective print length conforms to the condition not to perform a back feed, a label located between the head and cutter at the first printing subsequent to an issue (one or multiple labels) cannot be printed because no back feed is performed. This waste can be prevented by switching the stop position in the SYSTEM mode from "CUT" to

"HEAD." However, it is necessary to press the FEED key and move a label to the cutting position to take it out because the label is not stopped at the cutting position after printing has been completed.

In strip issue mode when the strip issue back feed setting is on and the strip position fine adjustment is set to – (negative), a back feed is performed because the print start position is misaligned. However, for labels whose label-to-label gap is 5 mm or more, no back feed is performed because the print start position is not misaligned.

<<Common in all versions>>

The print position is misaligned when printing under any of the following conditions.

The assumption for the following conditions is that labels/tags of which pitch is shorter than the distance between the print head and the sensor (approx. 11.5 mm) are used in batch issues.

- (1) After labels/tags are issued with "Back feed amount fine adjustment" being set for the Position Fine Adjust Command, another label/tag is issued without setting the back feed amount.
- (2) After labels/tags are issued without setting the "Back feed amount fine adjustment" for the Position Fine Adjust Command, another label/tag is issued with Back feed amount fine adjustment set.
- (3) After issuing labels/tags in the TPCL mode, the mode is changed to the LABEL mode and the label/tag is issued without setting the "Back feed amount fine adjustment" for the Position Fine Adjust Command.

When any of the above conditions is met, the print position on the second label/tag is misaligned. This is because when using the labels/tags of which pitch is shorter than the distance between the print head and the sensor, the gap between the first and second labels/tags passes through the sensor before printing the first label/tag, before switching to a different issue condition or the LABEL mode. Therefore, the third and later labels/tags are printed at the proper position.

Either of the language types, Kanji, Chinese and Korean, can be implemented. Any font other than the on-board fonts is selectable.

## 6.2 OUTLINE OF COMMANDS

### 6.2.1 FORMAT OF INTERFACE COMMAND

|     |                |    |     |
|-----|----------------|----|-----|
| ESC | Command & Data | LF | NUL |
|-----|----------------|----|-----|

- The length from [ESC] to [LF] [NUL] must be as specified by each command.
- Only the following control code is used:  
ESC (1BH), LF (0AH), NUL (00H)

### 6.2.2 HOW TO USE REFERENCE

**Function** Describes the outline of the function of the command.

**Format** Shows the format of the command.

The format designation method should conform to the following rules:

- Each set of small letters (such as aa, bbbb) indicates a parameter item.
- An item enclosed in parentheses may be omitted.
- “---” indicates the repetition of an item.
- Brackets and parentheses are used only in coding, and must not be transmitted in practice.
- Other symbols must always be inserted at designated positions before being transmitted.

**Term** Explains the term(s) used in the format.

\* “0 to 999” described in the entry range indicates that up to 3-digit variable-length entry is allowed. (Entry of “001” or “009” is also possible.) “000 to 999” indicates that the entry must be fixed at 3 digits.

**Explanation** Explains the command in detail.

**Note** Supplementary explanation of the command.

**Refer to** Related commands

**Examples** Explains the command examples.

[ESC] FM [LF] [NUL]

The above corresponds to the transfer of the following:

1B 46 4D 0A 00  
[ESC] F M [LF] [NUL]

### 6.2.3 PRECAUTIONS

The commands and parameters described in this specification must always be used. If any command or parameter other than those covered in this specification is used, the printer's operation will not be guaranteed.



## 6.3 COMMANDS RELATED TO SETTING

### 6.3.1 LABEL SIZE SET COMMAND

[ESC] D

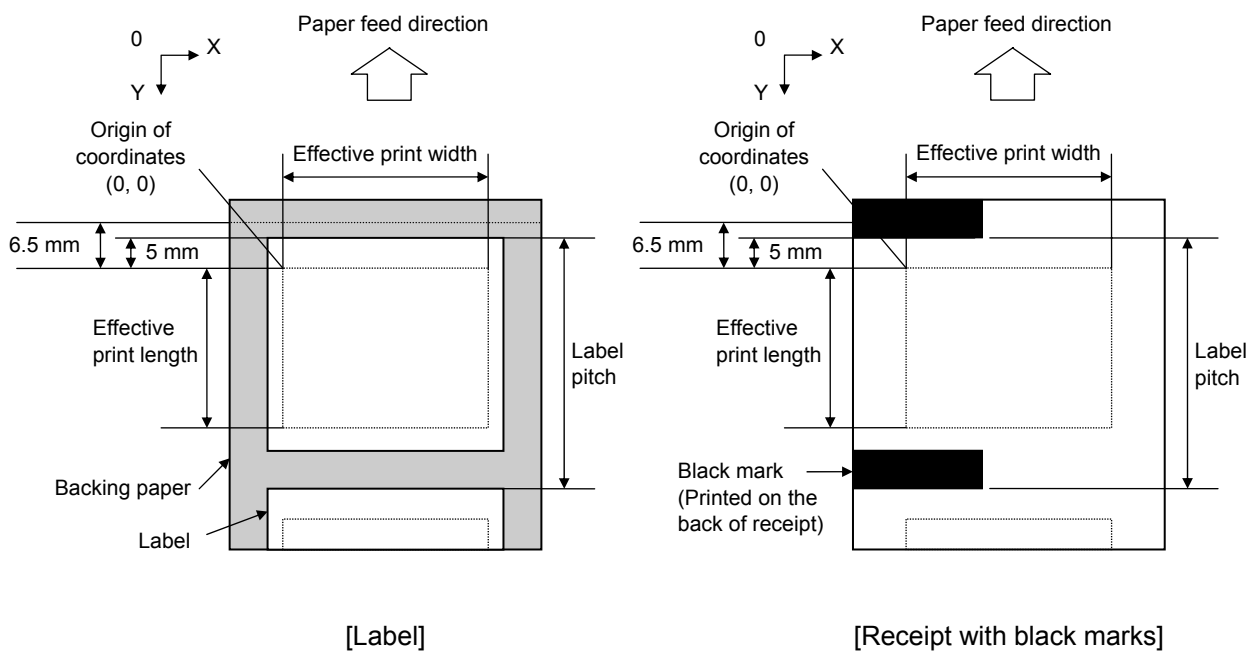
|          |                                                                                                                                                                                                                                                                                                                                              |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the size of a label or tag.                                                                                                                                                                                                                                                                                                             |
| Format   | [ESC] Daaaa, bbbb, cccc [LF] [NUL]                                                                                                                                                                                                                                                                                                           |
| Term     | <p>aaaa: Label/tag pitch<br/>Fixed at 4 digits (in 0.1 mm units)<br/>0100 (10.0 mm) to 9999 (999.9 mm)</p> <p>bbbb: Effective print width<br/>Fixed at 4 digits (in 0.1 mm units)<br/>0100 (10.0 mm) to 1057 (105.7 mm)</p> <p>cccc: Effective print length<br/>Fixed at 4 digits (in 0.1 mm units)<br/>0070 (7.0 mm) to 9970 (997.0 mm)</p> |

The size depends on the type of the new portable printer.

|                        | B-EP2DL-GHxx  | B-EP4DL-GHxx  |
|------------------------|---------------|---------------|
| Label/tag pitch        | 10 × 999.9 mm | 10 × 999.9 mm |
| Effective print width  | 48.0 mm       | 104.0 mm      |
| Effective print length | 997.0 mm      | 997.0 mm      |

**Explanation**

- (1) After the Form Store Start Command is sent, the Label Size Set Command must be sent before each field command, the Print Density Fine Adjust Command, or the Position Fine Adjust Command is sent.
- (2) To print data in non-print area at 5 mm from the leading edge of the label, the print start position can be changed by using the Position Fine Adjust Command. However, it is necessary to enlarge the gap between the labels.
- (3) The print origin of coordinates in the Y direction is at 6.5 mm from the center of the gap (black mark). When the gap (black mark) is 3 mm, the print origin of coordinates in the Y direction is at 5 mm from the leading edge of the label. (Refer to the figure below.)
- (4) In the compatible mode for the B-SP series, the effective print width is fixed at 48.0 mm.

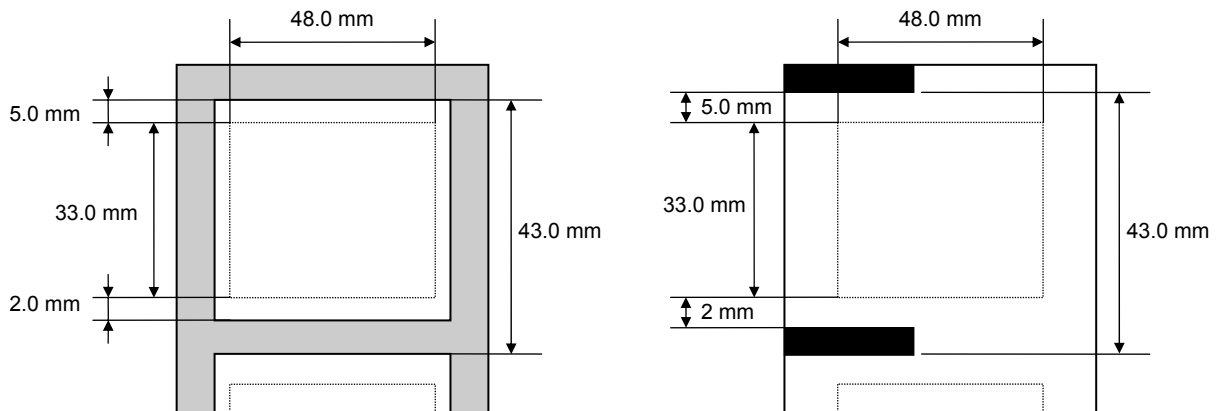


**Notes**

- (1) The label pitch length is backed up in memory (retained even if the power is turned off).

**Example**

[ESC] D0430, 0480, 0330 [LF] [NUL]



Programmable value range by the software

[mm]

| Item                                               |               | Model | B-EP2DL          |       | B-EP4DL   |       |
|----------------------------------------------------|---------------|-------|------------------|-------|-----------|-------|
|                                                    |               | Mode  | 203 dpi          |       | 203 dpi   |       |
|                                                    |               |       | Batch            | Strip | Batch     | Strip |
| Thermal head dot density                           |               |       | 8 dots/mm        |       | 8 dots/mm |       |
| Thermal head width                                 |               |       | 48.0 mm          |       | 104.0 mm  |       |
| Pitch                                              | Label         | Max.  | 10.0             | 13.0  | 10.0      | 13.0  |
|                                                    |               | Min.  | 999.9            | 67.0  | 999.9     | 67.0  |
|                                                    | Tag           | Max.  | 10.0             | -     | 10.0      | -     |
|                                                    |               | Min.  | 999.9            | -     | 999.9     | -     |
| Label length                                       |               | Max.  | 7.0              | 10.0  | 7.0       | 10.0  |
|                                                    |               | Min.  | 997.0            | 60.0  | 997.0     | 60.0  |
| Paper length                                       | Backing paper | Max.  | 16.0             |       | 50.0      |       |
|                                                    |               | Min.  | 58.0             |       | 115.0     |       |
|                                                    | Tag           | Max.  | 16.0             | -     | 50.0      | -     |
|                                                    |               | Min.  | 58.0             | -     | 115.0     | -     |
| Label width                                        |               | Max.  | 13.0             |       | 47.0      |       |
|                                                    |               | Min.  | 55.0             |       | 112.0     |       |
| Label-to-label gap                                 |               | Max.  | 3.0              |       | 3.0       |       |
|                                                    |               | Min.  | 7.0              |       | 7.0       |       |
| Black mark length                                  |               | Max.  | 3.0              |       | 3.0       |       |
|                                                    |               | Min.  | 7.0              |       | 7.0       |       |
| Effective print width                              |               | Max.  | 10.0             |       | 10.0      |       |
|                                                    |               | Min.  | 48.0             |       | 104.0     |       |
| Effective print length                             | Label         | Max.  | 7.0              | 10.0  | 7.0       | 10.0  |
|                                                    |               | Min.  | 997.0            | 60.0  | 997.0     | 60.0  |
|                                                    | Tag           | Max.  | 7.0              | -     | 7.0       | -     |
|                                                    |               | Min.  | 997.0            | -     | 997.0     | -     |
| Slow-up/down interval                              | Slow up       |       | 1.0              |       | 1.0       |       |
|                                                    | Slow down     |       | 1.0              |       | 1.0       |       |
| Paper thickness                                    | Label         |       | 100 μm to 120 μm |       |           |       |
|                                                    | Tag           |       | 120 μm           |       |           |       |
|                                                    | Receipt       |       | 65 μm to 75 μm   |       |           |       |
| Max. effective print length for on-the-fly issuing |               |       | 997.0            |       | 499.0     |       |

### 6.3.2 PRINTER ID SET COMMAND

### [ESC] ID

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets the ID for the printer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Format      | [ESC] ID; aa(,b) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Term        | aa: Printer ID (2-byte hex data)<br>0000H to FFFFH<br><br>b: Reserved area (Omissible)<br>Fixed at 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Explanation | (1) The printer ID is the information required to identify each printer when communicating according to the IrDA: TEC Protocol.<br><br>(2) When setting the reserved area to other than 0, an error results.                                                                                                                                                                                                                                                                                                                                                                            |
| Notes       | (1) The set printer ID is backed up in memory (even if the Initialize command ([ESC] WR, [ESC] @) is executed or the power is turned off).<br><br>(2) The last 5 digits of the printer's serial number have been set as the printer ID, at the time of shipment from the factory.<br><br>(3) In IrDA: TEC Protocol, the printer checks the set ID against the ID in the received command packet. If they do not match, the printer discards the command packet. However, when the ID in the command packet is "0", the printer accepts the command packet without checking the set IDs. |
| Example     | To set "03H 51H" as the ID of the printer:<br>[ESC] ID; [03H] [51H] [LF] [NUL]<br>In this case, the printer ID in status printing is "00849."                                                                                                                                                                                                                                                                                                                                                                                                                                           |

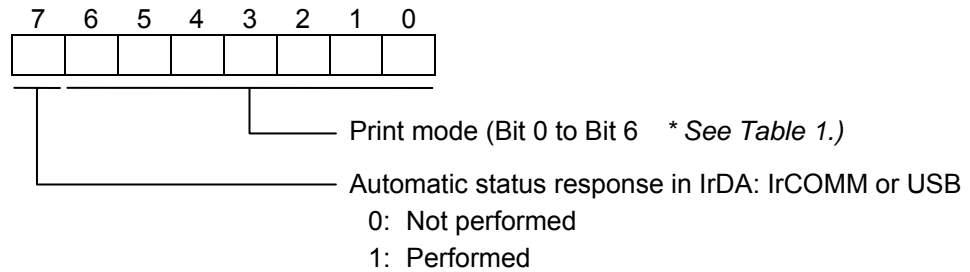
### 6.3.3 MODE SELECT COMMAND

[ESC] M

**Function** Changes the print mode.

**Format** [ESC] M; a,(b) [LF] [NUL]

**Term** a: Print mode designation



\* Table 1 Print mode

| HEX | Mode     | How to deal with the received data after an error is cleared |
|-----|----------|--------------------------------------------------------------|
| 30H | LABEL    | Discards                                                     |
| 31H | RECEIPT  | Discards                                                     |
| 32H | RECEIPT1 | Continues printing                                           |
| 34H | ESC/POS  | Continues printing                                           |
| 41H | TPCL     | Continues printing                                           |
| 42H | TPCL1    | Continues printing                                           |

- b: Print position detection feed (Omissible. If omitted, the print position detection feed is not performed.)
- 0: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is not performed after the mode is changed.
- 1: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is performed after the mode is changed.

- Explanation**
- (1) There are 4 types of the print mode: "LABEL," "RECEIPT," "TPCL" and "ESC/POS."
  - (2) "Automatic status response in IrDA: IrCOMM or USB" is the function for the specifications which do not allow the printer to spontaneously send the status through IrDA; IrCOMM or USB. This function enables the printer to forcefully send the status to the host, if the link between the printer and the host is established. However, if the link between the printer and the host is not established upon the status transmission, the printer cannot send the status. Therefore, the status is discarded. (In the next connection to the host, the printer does not send the status to the host.)
  - (3) The sensor is not used in the RECEIPT, RECEIPT1 or ESC/POS mode. When sensor detectable paper is used for receipts and labels, print position detection feed cannot be done in the LABEL, TPCL or TPCL1 mode. By setting the print position detection feed parameter to 1, print position detection feed is carried out after the mode is changed to LABEL, TPCL or TPCL1.
  - (4) In the TPCL1 mode, it is possible to re-print the last print data by pressing the FEED button.

Notes

- (1) The print mode designation (the specified print mode and the automatic status response in IrDA: IrCOMM or USB) is backed up in memory (even if the power is turned off).
- (2) The factory default is “TPCL mode” and “Automatic status response in IrDA: IrCOMM or USB is not performed.” (The IrDA protocol is “IrCOMM.”)
- (3) When the print mode is changed, the type of sensor is automatically changed.

|                    |                                                |
|--------------------|------------------------------------------------|
| LABEL mode (0):    | The previously backed up sensor is designated. |
| TPCL mode (A):     | The previously backed up sensor is designated. |
| TPCL1 mode (B):    | The previously backed up sensor is designated. |
| RECEIPT mode (1):  | No sensor is designated.                       |
| RECEIPT1 mode (2): | No sensor is designated.                       |
| ESC/POS mode (4):  | No sensor is designated.                       |
- (4) If the RECEIPT or ESC/POS mode is selected or no sensor is designated in the LABEL or TPCL mode, an initial feed is not performed when the cover is closed (when the print position detection feed after the cover is closed is enabled with key operations or using the set command ([ESC] ZM03)).
- (5) When the mode change is finished, the printer sends the normal end status or an ACK to the host. However, when the mode is changed to the TPCL mode, the printer does not send the status. In IrDA: IrCOMM or USB, only when bit 7 of the print mode designation is set to “1,” the printer sends the status.
- (6) The print mode can be changed by the printer itself. However, since the setting for the automatic status response in IrDA: IrCOMM or USB cannot be changed, the setting remains as the same.
- (7) The print position detection feed is performed according to the conditions, such as, label pitch, fine adjustment, and sensor selection, which were set in the LABEL or TPCL mode before the printer is operated in the RECEIPT, RECEIPT1 or ESC/POS mode. If no sensor is selected, the print position detection feed will not be performed.
- (8) After performing a print position detection feed, the printer does not send a process end status. If an error occurs during the print position detection feed, the print position detection feed is performed by clearing the error using the PAUSE key (when the print position detection feed after the cover is closed is enabled with key operations or using the set command ([ESC] ZM03)).
- (9) When changing the print mode by the printer itself, the print position detection feed parameter cannot be set.
- (10) When the mode select command is designated with the print position detection feed at the end of a print data issued in the RECEIPT1 or ESC/POS mode, and if an error occurs while printing, the printing will restart after the error is cleared and then, the print mode will be changed to the LABEL or TPCL mode and a print position detection feed is performed. When the print position detection feed is omitted, the mode is not changed to LABEL or TPCL. (The mode select command is ignored.)

- (11) When the LABEL or TPCL mode is selected in the mode select command and the print position detection feed parameter is set 0 (not performed), and if an error occurs while the printer issues in the RECEIPT1 or ESC/POS mode, the print mode is changed to the LABEL or TPCL mode after the error is cleared. (The mode select command is executed.)
- (12) Although this command is received while the command is being stored in a form, the mode is not changed.

## 6.4 COMMANDS RELATED TO FINE ADJUSTMENT

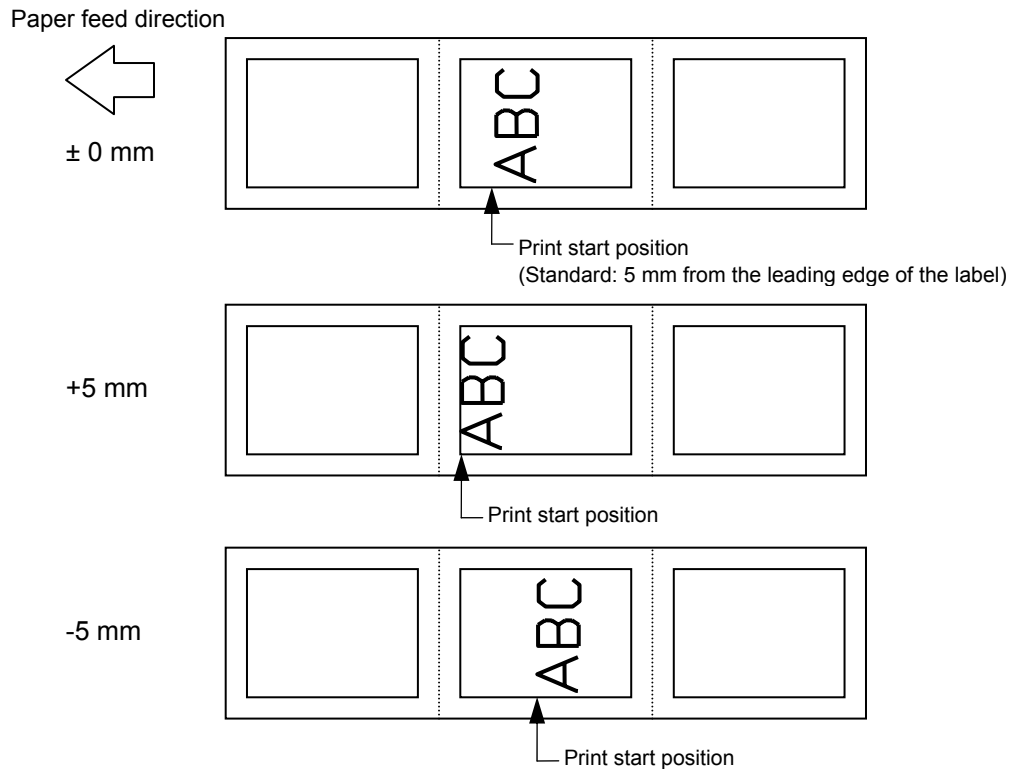
### 6.4.1 PRINT START POSITION FINE ADJUST COMMAND [ESC] AX

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Adjusts the feed value so that the label will be shifted forward or backward from the standard print start position.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Format   | [ESC] AX; abbb(, cddd, eff) [LF] [NUL]<br><br>[In compatible mode for the B-SP series]<br>[ESC] AX; abbb(, cddd, eff) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Term     | <p>a: Indicates the direction, forward or backward, in which a fine adjustment is to be made.<br/>+: Backward<br/>-: Forward</p> <p>bbb: Fine adjustment value for print position<br/>000 to 500 (in 0.1 mm units)</p> <p>c: Indicates the direction of the strip position, forward or backward.<br/>+: Backward<br/>-: Forward</p> <p>ddd: Fine adjustment value for strip position (Omissible)<br/>000 to 030 (in 0.1 mm units)<br/>* Fine adjustment in - (forward) direction is made between 000 and 020.</p> <p>eff: Reserved area (Omissible)<br/>Omitted or +20 (Fixed)<br/>* If omitted, print is started at 5 mm from the leading edge of the label.<br/>* If set to +20, print is started at 3 mm from the leading edge of the label.</p> <p>[In compatible mode for the B-SP series]</p> <p>a: Indicates the direction, forward or backward, in which a fine adjustment is to be made.<br/>+: Backward<br/>-: Forward</p> <p>bbb: Fine adjustment value for print position<br/>000 to 500 (in 0.1 mm units)</p> <p>cddd: Indicates that back feed amount is finely adjusted backward. (Omissible)<br/>+000 (Fixed)</p> <p>eff: Indicates that back feed amount is finely adjusted forward. (Omissible)<br/>+20 (Fixed)</p> <p>* When the omissible parameters (,cddd and ,eff) are omitted, print is started at 5 mm from the leading edge of the label.<br/>When the omissible parameters (,cddd and ,eff) are set, print is started at 3 mm from the leading edge of the label.</p> |



Explanation

- (1) The print start position is adjusted to stop backward or forward from the standard print start position.
- (2) When the back feed amount fine adjustment is enabled by this command while the command is being stored in a form, the print start position moves backward by 2mm from the standard position, which enlarges the effective print area.
- (3) If this command is stored in a form, the print position is automatically adjusted when the form is invoked.
- (4) When the back feed amount fine adjustment is enabled by this command while the command is being stored in a form, or when the command is sent without being stored in a form, printing starts at 5 mm from the leading edge of the label.
- (5) When the power is turned on again, the backed up fine adjustment value is set.
- (6) When the print position is changed, or when the gap between the labels is not 3 mm, the Position Fine Adjust Command should be used as required. (When the gap between the labels is 3 mm, the standard print start position is 5 mm from the leading edge of the label.)
- (7) When the compatible mode for the B-SP series is off, and the reserved area (.eff) is set to +20, printing starts at 3 mm from the leading edge of the label. When this parameter is omitted, printing starts at 5 mm from the leading edge of the label. Note that when the parameter is set to any value other than +20, a command error occurs.
- (8) When the compatible mode for the B-SP series is on, and the omissible parameters (.cddd and .eff) are set to +000 and +20, respectively, printing starts at 3 mm from the leading edge of the label. When the parameters are omitted, printing starts at 5 mm from the leading edge of the label. Note that when the parameters are set to any value other than +000 and +20, respectively, a command error occurs.
- (9) When the fine adjustment for print position in + (backward) direction is set to any value exceeding +10.5 mm (distance between the print head and the sensor minus 1 mm), the fine adjustment value is corrected to +10.5 mm before printing.
- (10) The fine adjustment value for strip position is valid only when “the compatible mode for the B-SP series” is turned off (disabled) in the SYSTEM mode. When the parameter “a” is set to any value other than “+” or “-,” a command error occurs.



Notes

- (1) The set fine adjustment value for print position is backed up in memory (retained even if the power is turned off).
- (2) The factory default value is 0.0 mm.
- (3) The fine adjustment value for print position and strip position changed by the Position Fine Adjust Command in the TPCL mode, is also effective in the LABEL mode. However, the fine adjustment value for back feed changed in the LABEL mode is not effective in the TPCL mode.
- (4) When the back feed amount fine adjustment is enabled, printing starts at 3 mm from the leading edge of the label.
- (5) The back feed amount fine adjustment is enabled only while the command is being stored in a form. It is disabled when the command is sent without being stored in a form.
- (6) When print position fine adjustment is selected in the SYSTEM mode (through key operations on the printer), the fine adjustment value is a sum of the value in the fine adjustment command and the system mode fine adjustment value. Note that the maximum fine adjustment value is  $\pm 50.0$  mm.
- (7) The fine adjustment value for strip position up to V1.0C is valid only when the fine adjustment value for print position is not selected (fine adjustment value = 0).
- (8) When the label pitch length is 20.0 mm or more but less than 24.0 mm and the effective print length is 15.0 mm or more or the label pitch length is 24.0 mm or more, a back feed is performed before printing.

## 6.4.2 PRINT DENSITY FINE ADJUST COMMAND

[ESC] AY

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Adjusts the automatically set print density.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Format      | [ESC] AY; abb, c (, d) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Term        | <p>a: Indicates whether to increase or decrease the density<br/>         +: Increase (Darker)<br/>         -: Decrease (Lighter)</p> <p>bb: Fine adjustment value for print density<br/>         00 to 30 (in units of 1 step)</p> <p>c: Print mode<br/>         1 (Fixed): Direct thermal</p> <p>d: Head output division designation<br/>         (Omissible. When omitted, settings backed up by the memory are valid.)</p> <p>2-inch print head width<br/>         0: Auto (Divided by 2 or 3)<br/>         1: Reserved (When designated, automatic selection of bipartite/tripartite division is performed.)<br/>         2: Divided by 3 (Fixed)<br/>         3: Auto1 (Not divided/Divided by 2 or 3)/Print quality oriented<br/>         4: Reserved (When designated, tripartite division is performed.)<br/>         5: Auto2 (Not divided/Divided by 2 or 3)/Print speed oriented (supported in V1.0E or later)</p> <p>4-inch print head width<br/>         0: Auto (Divided by 2, 3 or 6)<br/>         1: Reserved (When designated, automatic selection of bipartite/tripartite/6-partite division is performed.)<br/>         2: Reserved (When designated, automatic selection of bipartite/tripartite/6-partite division is performed.)<br/>         3: Auto1 (Not divided/Divided by 2, 3 or 6)<br/>         4: Divided by 6 (Fixed)</p> |
| Explanation | <p>(1) The standard density is finely adjusted to increase or decrease.</p> <p>(2) When any fine adjustment value for print density out of the above range is set, a command error occurs.</p> <p>(3) The default value of the head output division designation is “3: Auto1 (Not divided/Divided by 2 or 3)” on the 2-inch print head and “3: Auto1 (Not divided/Divided by 2, 3 or 6)” on the 4-inch print head.</p> <p>(4) If this command is stored in a form, the print density is automatically adjusted when the form is invoked.</p> <p>(5) If this command is stored in a form, the print density is adjusted when this command is received.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

- (6) When "0: Auto" is designated on the 2-inch print head, "Divided by 2" or "Divided by 3" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching between "Divided by 2" and "Divided by 3." Therefore, do not designate "0: Auto" when a serial barcode is printed.
- (7) When "3: Auto1" or "5: Auto2" is designated for the 2-inch print head, "Not divided," "Divided by 3" or "Divided by 2" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among "Not divided," "Divided by 2" and "Divided by 3." Therefore, do not designate "3: Auto1" or "5: Auto2" when a serial barcode is printed.

The difference between Auto1 and Auto2 is while Auto1 is print quality oriented, Auto2 is print speed oriented. Auto2 is designated to increase the print speed although the print is slightly faded.

- (8) When "0: Auto" is designated on the 4-inch print head, "Divided by 2", "Divided by 3" or "Divided by 6" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among "Divided by 2," "Divided by 3" and "Divided by 6." Therefore, do not designate "0: Auto" when a serial barcode is printed.
- (9) When "3: Auto1" is designated on the 4-inch print head, "Not divided," "Divided by 2," "Divided by 3" or "Divided by 6" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among "Not divided," "Divided by 2," "Divided by 3" and "Divided by 6." Therefore, do not designate "3: Auto1" when a serial barcode is printed.

|       |
|-------|
| Notes |
|-------|

- (1) The set fine adjustment value for print density and the head output division designation are backed up in memory (retained even if the power is turned off).
- (2) The fine adjustment values changed by the Print Density Fine Adjust Command in the LABEL mode, are also effective for the TPCL, RECEIPT and ESC/POS modes.
- (3) When the head output division designation is omitted, the backed up value in memory is used.
- (4) When print density fine adjustment is selected in the SYSTEM mode (through key operations on the printer), the fine adjustment value is a sum of the value in the fine adjustment command and the system mode fine adjustment value. Note that the maximum fine adjustment value is  $\pm 30.0$  mm.

### 6.4.3 STRIP SENSOR THRESHOLD VALUE SET COMMAND [ESC] AZ

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the sensor threshold value to switch the mode between strip and batch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format   | [ESC] AZ; a [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Term     | a: Setting<br>0: Operation in conformance with the strip sensor<br>1: Operation in conformance with the strip sensor<br>2: Fixed at the batch mode<br>3: Fixed at the strip mode<br>4: Reserved                                                                                                                                                                                                                                                                                                                                                                                                 |
| Notes    | (1) The set parameter is backed up and kept until a new value is set using this command. When the power is turned on, the backed up value is retrieved and set.<br>(2) "0: Operation in conformance with the strip sensor" has been set as the default at the time of shipment from the factory.<br>(3) When either "2: Fixed at the batch mode" or "3: Fixed at the strip mode" for parameter "a," is selected, the printer operates in the specified mode, without automatically switching between the batch and strip modes.<br>(4) When "4: Reserved" is selected, this command is ignored. |

## 6.5 COMMANDS RELATED TO DRAWING FORMAT

### 6.5.1 LINE FORMAT COMMAND

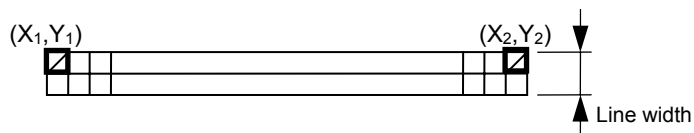
[ESC] LC

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the line format and draws the line.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format   | [ESC] LC; aaaa, bbbb, cccc, dddd, e, f [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                            |
| Term     | <p>aaaa: Start point X-coordinate<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>bbbb: Start point Y-coordinate<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: End point X-coordinate<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>dddd: End point Y-coordinate<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>e: Type of line<br/>0: Line (horizontal, vertical)<br/>1: Rectangle</p> <p>f: No. of line width dots<br/>1 to 9 (in 0.1 mm units)</p> |

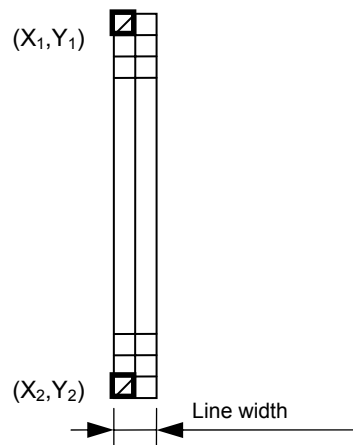
#### Explanation

(1) The relation between the coordinates of the start and end points and the width of the line, is as follows:

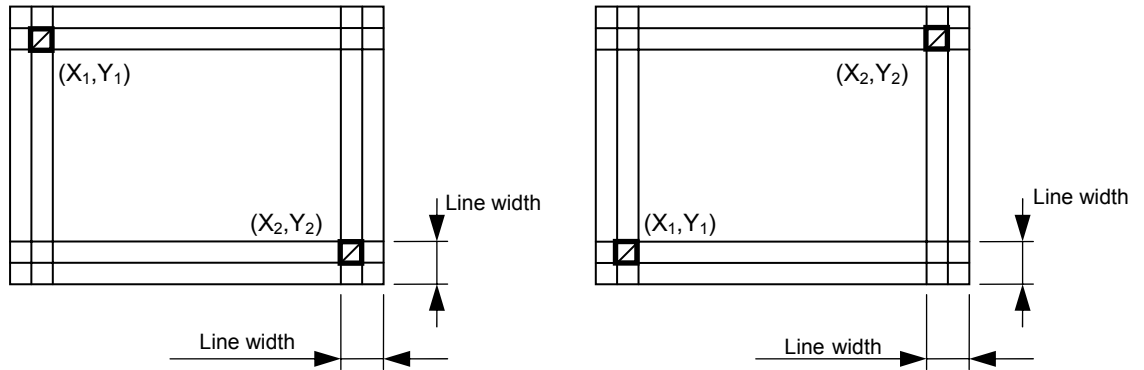
① Horizontal line (In the case of  $|Y_2 - Y_1| = 0$ )



② Vertical line (In the case of  $|X_2 - X_1| = 0$ )



③ Rectangle



- (2) When the start and end point coordinates which make a slant line are specified, a rectangle is drawn, even if "Line" is selected for the line type.
- (3) If the print ratio of one line (the print head width) is higher than defined, printing may become poor, or the printer may be reset. When a horizontal line is to be drawn, note the print ratio.
- (4) When the coordinates, which make data over the head width, is specified, printing is not guaranteed.

## 6.5.2 BIT MAP FONT FIELD COMMAND

[ESC] PC

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format indicating the position on the label at which the bit map font is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format   | [ESC] PCaa; bbbb, cccc, d, e, f, gg, h, ii, j, k(, PI) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Term     | <p>aa: Character string No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode/two-dimensional field.)</p> <p>bbbb: Print origin of X-coordinate of character string<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of character string<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Character horizontal magnification<br/> 1: 0.5 magnification      5: 2.5 magnification<br/> 2: 1 magnification        6: 3 magnification<br/> 3: 1.5 magnification     7: 3.5 magnification<br/> 4: 2 magnification        8: 4 magnification</p> <p>e: Character vertical magnification<br/> 1: 0.5 magnification     5: 2.5 magnification<br/> 2: 1 magnification        6: 3 magnification<br/> 3: 1.5 magnification     7: 3.5 magnification<br/> 4: 2 magnification        8: 4 magnification</p> <p>f: Type of font<br/> A: Standard (12 × 24 dots)<br/> B: Bold Character (48 × 96 dots)<br/> C: Writable Character (24 × 24 dots)<br/> D: Price Font 1 (16 × 40 dots)<br/> E: Price Font 2 (32 × 48 dots)<br/> 203-dpi print head<br/> F: Times Roman (Bold) 21 points<br/> G: Helvetica (Bold) 18 points<br/> H: Letter Gothic (Medium) 14.3 points<br/> I: Courier (Medium) 15 points<br/> J: Presentation (Bold) 27 points<br/> O: GOTHIC725 Black 6 points<br/> P: Kanji/Writable Character (16 × 16 dots)<br/> Q: Chinese/Writable Character (24 × 24 dots)<br/> R: Korean/Writable Character (24 × 24 dots)<br/> S: (Reserved)<br/> T: (Reserved)<br/> U: (Reserved)</p> |



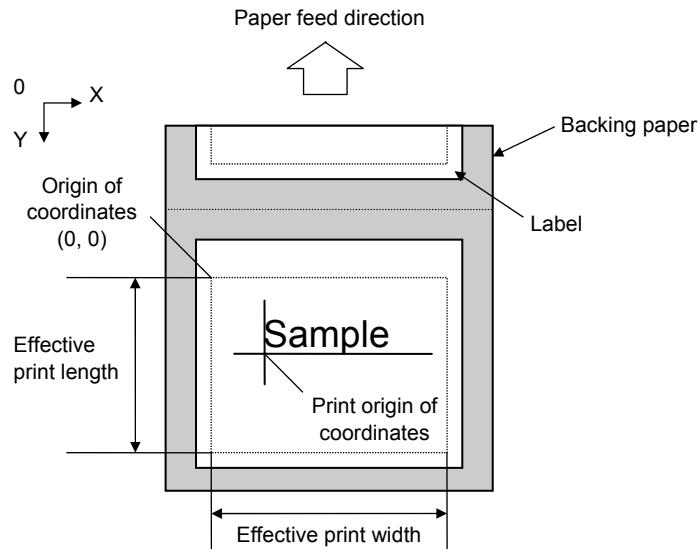
- gg: Rotational angles of a character or character string  
00: 0° (chara.) 0° (chara.-string)  
01: 90° (chara.) 90° (chara.-string)  
02: 180° (chara.) 180° (chara.-string)  
03: 270° (chara.) 270° (chara.-string)
- h: Selects black character or reverse character  
B (Fixed value): Black character
- ii: Data length  
00 to 99 **NOTE:** When "00" is designated, the length is equivalent to the data sent by the Data Print Command.  
*JIS 8 code: Data which is separated by [LF]*  
*Packed BCD code: Data which is delimited by "F"*
- j: Data code  
1: JIS 8 code (Fixed at 1 when the type of font is "C," "Q" or "R.")  
2: Packed BCD code (only for IrDA: TEC Protocol)
- k: Fixed data No.  
0 (Fixed value)
- Pl: Print position (Omissible. If omitted, the print position is left-aligned.)  
0: Left  
1: Center  
2: Right

**Explanation**

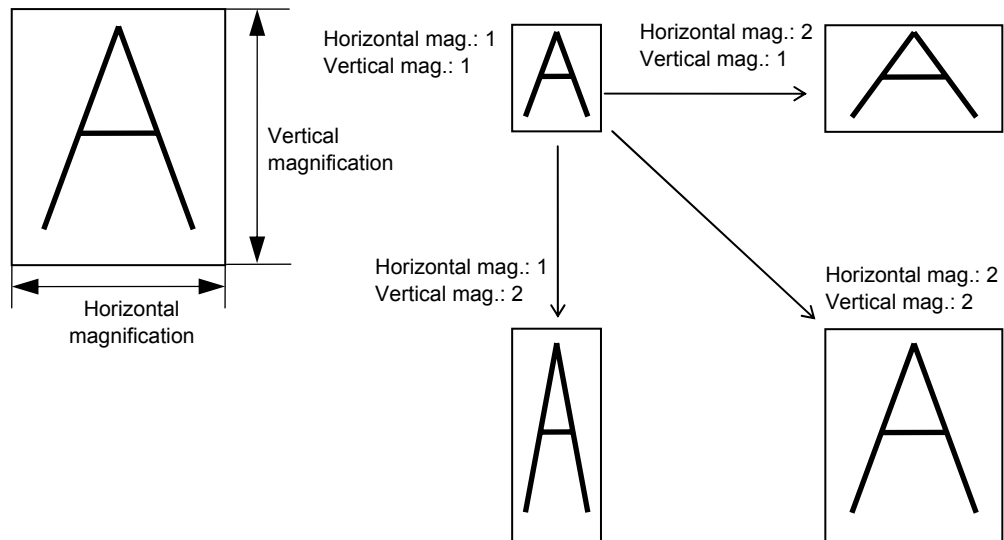
(1) Character string No.

The data in the Data Print Command (X) is selected and linked in the order of this character string No. (The format of character string Nos. 00 and 01 is linked to the first and second data, respectively. In the same order, the format is linked to the data.) Therefore, the Nos. of the bit map font character string, the outline font character string, and the barcode/two-dimensional code, should be consecutive, starting from 00 (in ascending order). The same No. must not be used in one form for the bit map font character string field, the outline font character string field, and the barcode/two-dimensional code field.

(2) Print origin of coordinates



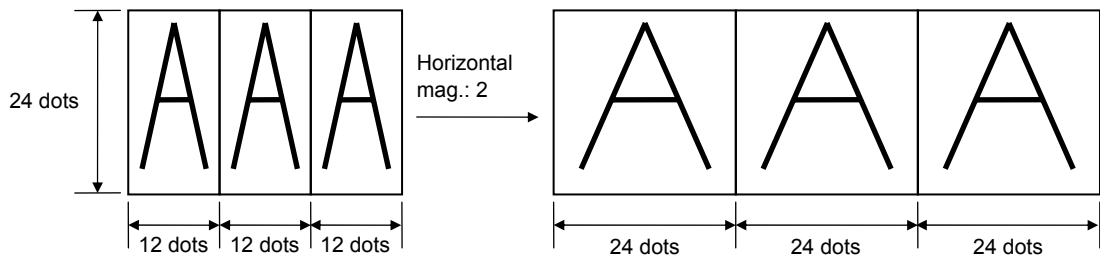
(3) Horizontal magnification and vertical magnification



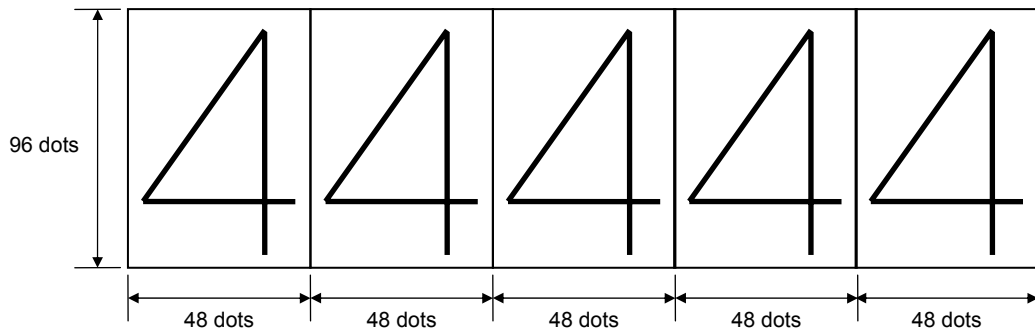
**NOTE:** When a large character or many characters is/are printed, the print density may become lower. (When the print ratio per line is high, the print density may become lower.)

(4) Space between characters is described below.

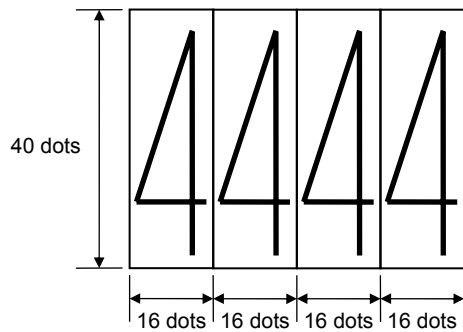
[Standard character]



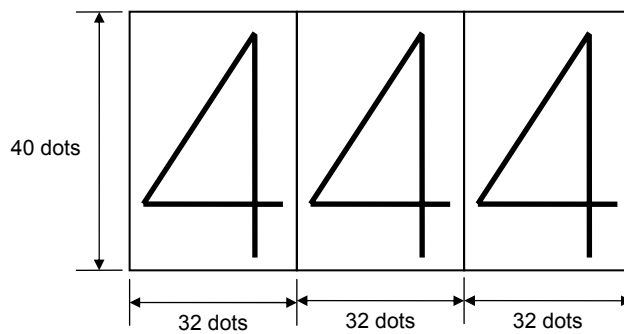
[Bold character]



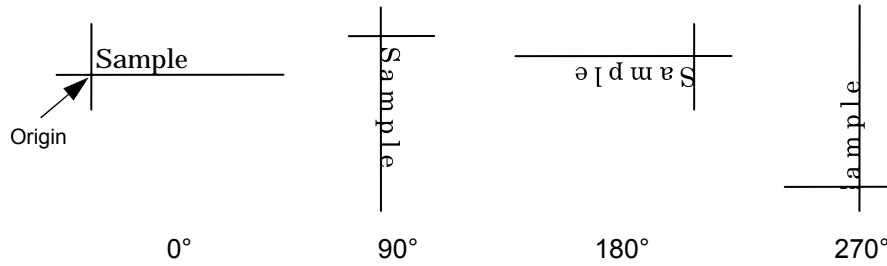
[Price font 1 (Horizontal mag.: 1)]



[Price font 1 (Horizontal mag.: 2)]



(5) Rotational angles of a character and character string



(6) Data length, Data code

JIS 8 code ..... The length that one-byte data is counted as one digit  
Packed BCD..... The length before packed

| Data code  | Data      | Data to be sent     | Data length |
|------------|-----------|---------------------|-------------|
| JIS 8      | 1 2 3 4 5 | 31H 32H 33H 34H 35H | 5           |
| Packed BCD | 1 2 3 4 5 | 12H 34H 50H         | 5           |

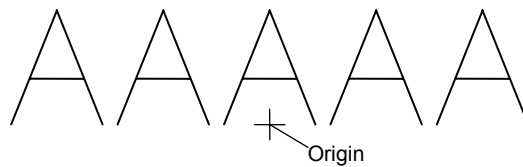
\* When the same data is sent, the data length to be set is the same value in both data codes, JIS 8 and Packed BCD.

(7) Print position

- Left (Default)



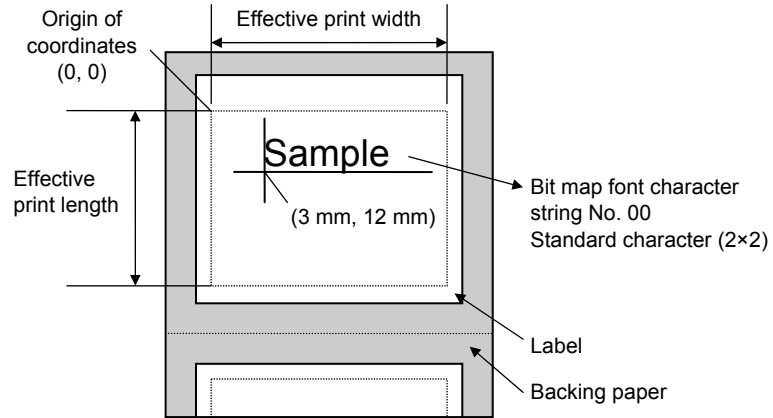
- Center



- Right



Example



```
[ESC] XO; 01, 1 [LF] [NUL]
[ESC] D0430, 0480, 0400 [LF] [NUL]
[ESC] PC00; 0030, 0120, 4, 4, A, 00, B, 00, 1, 0, P0 [LF] [NUL]
[ESC] XP [LF] [NUL]
```

Data Print Command (not for IrDA:TEC Protocol)

```
[ESC] X [01H] [01H] [01H] SAMPLE [LF]
```

### 6.5.3 OUTLINE FONT FIELD COMMAND

[ESC] PV

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the outline font is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format   | [ESC] PVaa; bbbb, cccc, dddd, eeee, f, (.ghh), ii, j, kk, l, m, (,Pn) (,Qoooo,Rppp) [LF]<br>[NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Term     | <p>aa: Character string No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode/two-dimensional code field.)</p> <p>bbbb: Print origin of X-coordinate of character string<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of character string<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>dddd: Character width<br/>0020 to 0300 (in units of 0.1 mm)</p> <p>eeee: Character height<br/>0020 to 0300 (in units of 0.1 mm)</p> <p>f: Type of font<br/>A: TEC Font 1 (Helvetica [Bold])<br/>B: TEC Font 1 (Helvetica [Bold], Proportional)<br/>F: Price Font 2<br/>K: Reserved<br/>C, D, E: Reserved (If specified, it is processed as "B.")</p> <p>ghh: Character-to-character space width (Omissible. If omitted, the character-to-character space width depends on the designated font.)<br/>g: +, -<br/>hh: 00 to 99 (dot)</p> <p>ii: Rotational angles of a character and character string<br/>00: 0° (chara.) 0° (chara.-string)<br/>01: 90° (chara.) 90° (chara.-string)<br/>02: 180° (chara.) 180° (chara.-string)<br/>03: 270° (chara.) 270° (chara.-string)</p> <p>j: Selects black character or reverse character<br/>B (Fixed value): Black character</p> <p>kk: Data length<br/>00 to 99 <b>NOTE:</b> When "00" is designated, the length is equivalent to the data sent by the Data Print Command.<br/>JIS8 code: Data which is delimited by [LF]<br/>Packed BCD code: Data which is delimited by "F"</p> <p>l: Data code<br/>1: JIS8 code<br/>2: Packed BCD code (only for IrDA: TEC Protocol)</p> <p>m: Fixed data No.<br/>0 (Fixed value)</p> |

Pn: Print position (Omissible. If omitted, the print position is left-aligned.)

P0: Left

P1: Center

P2: Right

Qoooo: Character string width (Omissible. If omitted, the width is set to 0000.)

0000 to 1600 (in units of 0.1mm)

Rpp: No. of character string digits (Omissible. If omitted, the number of digits is 00.)

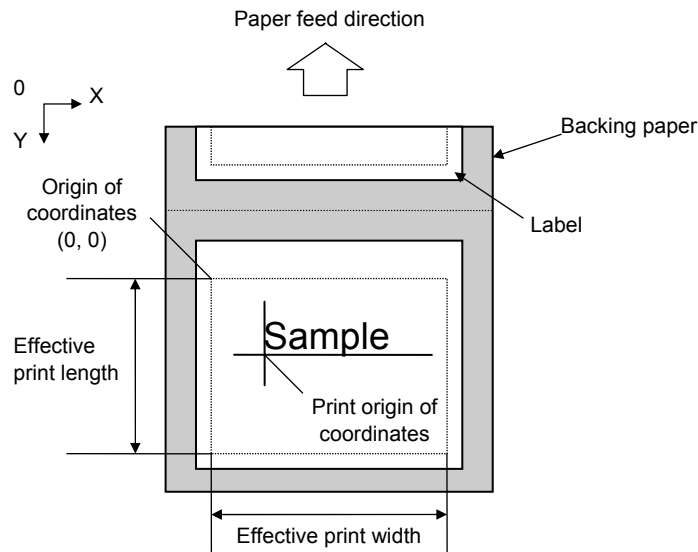
00 to 99

**Explanation**

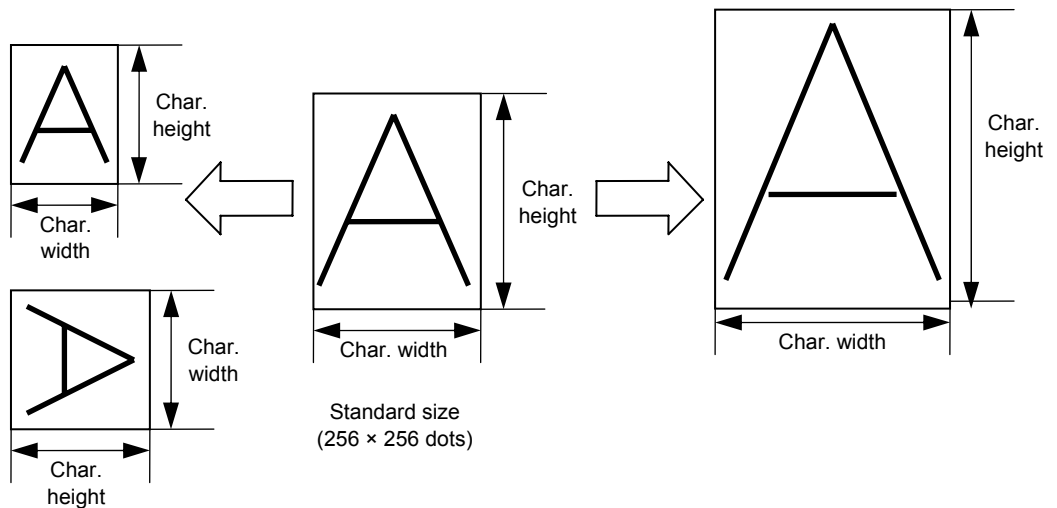
(1) Character string No.

The data in the Data Print Command (X) is selected and linked in the order of this character string No. (The format of character string Nos. 00 and 01 is linked to the first and second data, respectively. In the same order, the format is linked to the data.) Therefore, the Nos. of the bit map font character string, the outline font character string, and the barcode/two-dimensional code, should be consecutive, starting from 00 (in ascending order). The same No. must not be used in one form for the bit map font character string field, the outline font character string field, and the barcode/two-dimensional code field.

(2) Print origin of coordinates



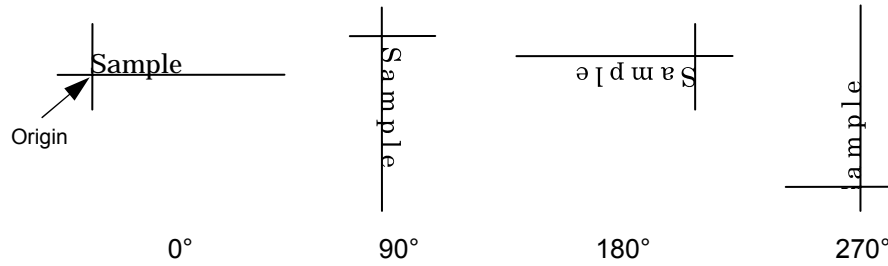
(3) Character width and character height



**NOTE:** When a large character or many characters is/are printed, the print density may become lower. (When the print ratio per line is high, the print density may become lower.)



(4) Rotational angles of a character and character string

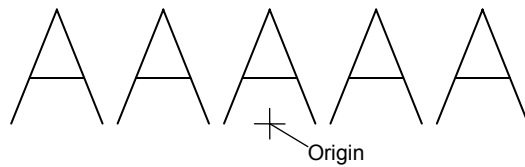


(5) Print position

- Left (Default)



- Center



- Right



(6) Character string width and number of character string digits

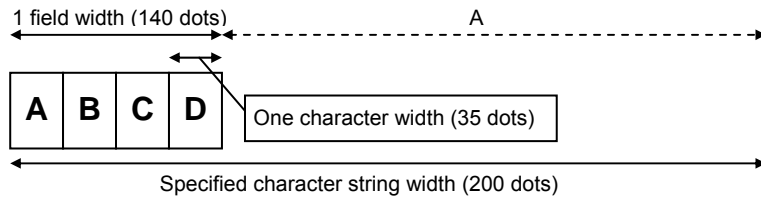
Usually, one character size is determined by the character width and height. When the character string width and number of character string digits are specified, the character width will be automatically changed when printed. If the following conditions are satisfied, however, these parameter settings become ineffective, and the characters are printed in normal size.

- Conditions of ineffectiveness
  - (1) These parameters are omitted.
  - (2) The character string width is set to "0."
  - (3) No. of print data  $\geq$  No. of specified character string digits

Conditions that these parameters become effective are described on the following pages.

- ① When one field width < specified character string width  
(Space between characters = 0, Specified character string digits = 6)

■ Print image when the parameter setting is omitted.

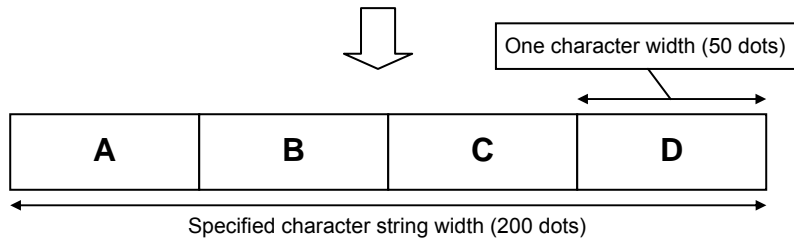


$A = \text{Specified character string width} - 1 \text{ field width} = 200 \text{ dots} - 140 \text{ dots} = 60 \text{ dots}$

$B = A / \text{Data length} = 60 \text{ dots} / 4 = 15 \text{ dots}$

One character width = 1 character width + B = 35 dots + 15 dots = 50 dots

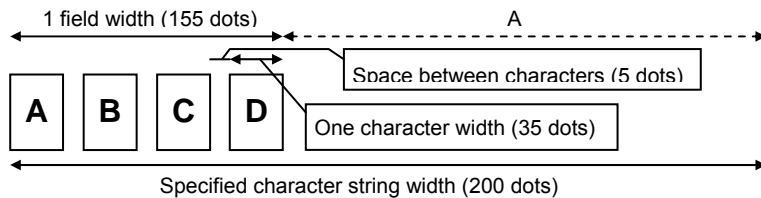
■ Print image when the parameter setting is specified.



\* When the number of print data is 6 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ② When one field width < specified character string width  
(Space between characters  $\geq 0$ , Specified character string digits = 5)

■ Print image when the parameter setting is omitted.

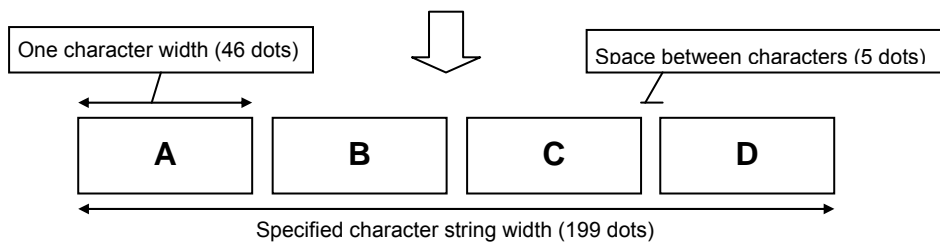


$A = \text{Specified character string width} - 1 \text{ field width} = 200 \text{ dots} - 155 \text{ dots} = 45 \text{ dots}$

$B = A / \text{Data length} = 45 \text{ dots} / 4 \approx 11 \text{ dots}$

One character width = 1 character width + B = 35 dots + 11 dots = 46 dots

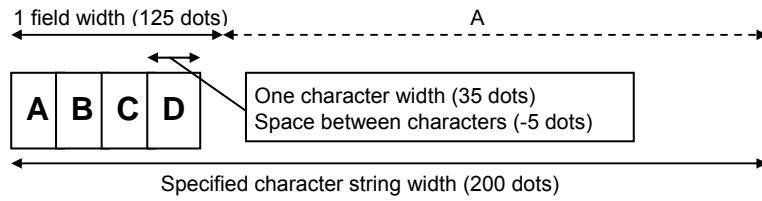
■ Print image when the parameter setting is specified.



\* When the number of print data is 5 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ③ When one field width < specified character string width  
(Space between characters < 0, Specified character string digits = 8)

- Print image when the parameter setting is omitted.



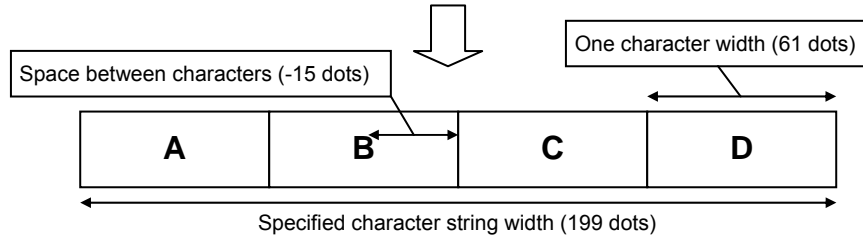
Corrected space between characters= $((\text{Specified character string digits} - \text{data length}) \times 0.5 + 1) \times \text{Space between characters} = -15 \text{ dots}$

$A = \text{Specified character string width} - (1 \text{ character width} \times \text{Data length} + (\text{corrected space between characters} \times (\text{Data length} - 1))) = 200 \text{ dots} - 95 \text{ dots} = 105 \text{ dots}$

$B = A / \text{Data length} = 105 \text{ dots} / 4 \approx 26 \text{ dots}$  (rounded down)

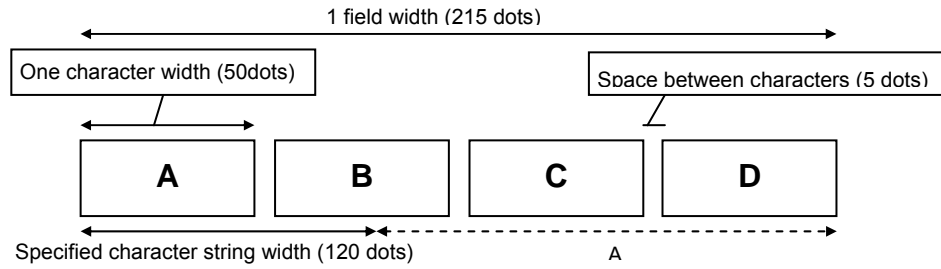
One character width = 1 character width + B = 35 dots + 26 dots = 61 dots

- Print image when the parameter setting is specified.



\* When the number of print data is 8 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ④ When one field width  $\geq$  specified character string width  
(Space between characters  $\geq 0$ , Specified character string digits = 6)
- Print image when the parameter setting is omitted.

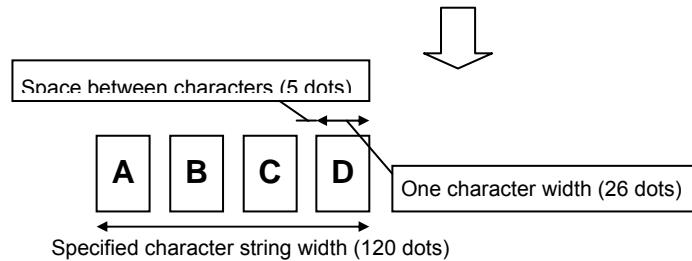


$A = 1 \text{ field width} - \text{Specified character string width} = 215 \text{ dots} - 120 \text{ dots} = 95 \text{ dots}$

$B = A / \text{Data length} = 95 \text{ dots} / 4 \approx 24 \text{ dots (rounded up)}$

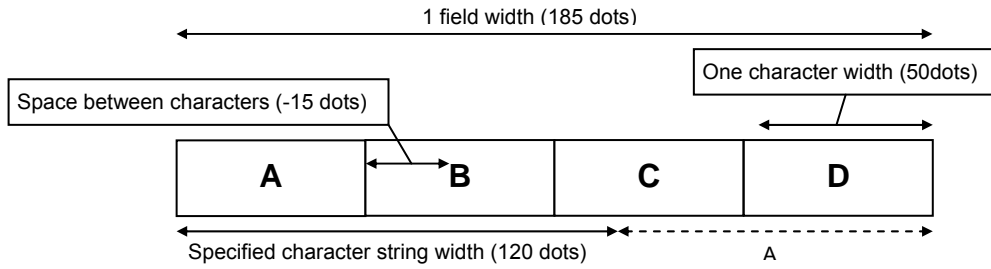
$\text{One character width} = 1 \text{ character width} - B = 50 \text{ dots} - 24 \text{ dots} = 26 \text{ dots}$

- Print image when the parameter setting is specified.



\* When the number of print data is 6 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

- ⑤ When one field width  $\geq$  specified character string width  
(Space between characters  $<$  0, Specified character string digits = 5)
  - Print image when the parameter setting is omitted.

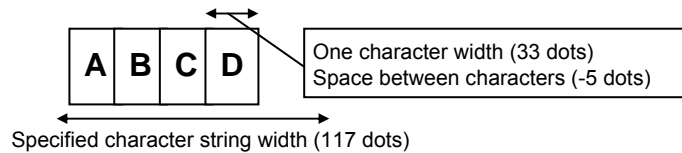


$A = 1 \text{ field width} - \text{Specified character string width} = 185 \text{ dots} - 120 \text{ dots} = 65 \text{ dots}$

$B = A / \text{Data length} = 65 \text{ dots} / 4 = 17 \text{ dots (rounded up)}$

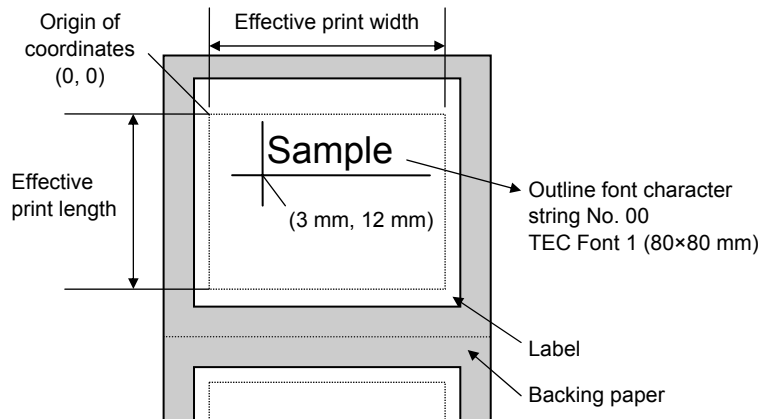
$\text{One character width} = 1 \text{ character width} - B = 50 \text{ dots} - 17 \text{ dots} = 33 \text{ dots}$

- Print image when the parameter setting is specified.



\* When the number of print data is 5 digits or more, the condition of ineffectiveness (3) is satisfied. In this case, the characters are printed in normal width.

Example



```
[ESC] XO; 01, 1 [LF] [NUL]
[ESC] D0430, 0480, 0400 [LF] [NUL]
[ESC] PV00; 0030, 0120, 0050, 0050, A, 00, B, 00, 1, 0, P0 [LF] [NUL]
[ESC] XP [LF] [NUL]
```

Data print command (not for IrDA:TEC Protocol)

```
[ESC] X [01H] [01H] [01H] SAMPLE [LF]
```

Commands to be registered

[ESC] XO; 05, 1 [LF] [NUL]  
[ESC] D0780, 0480, 0750 [LF] [NUL]  
[ESC] AY; +00, 1, 0 [LF][NUL]  
[ESC] AX; +000 [LF] [NUL]  
[ESC] PV01; 0325, 0350, 0080, 0100, F,-08, 03, B, 00, 1, 0, P2, Q0300, R07 [LF] [NUL]  
[ESC] PV02; 0165, 0000, 0030, 0060, F, 02, B, 00, 1, 0 [LF] [NUL]  
[ESC] XB03; 0270, 0290, 5, 3, 02, 2, 0100, 000, 0, 00, 1, 0 [LF] [NUL]  
[ESC] XB04; 0270, 0170, 5, 3, 02, 2, 0100, 000, 0, 00, 1, 0 [LF] [NUL]  
[ESC] XP [LF] [NUL]

Issue command (not for IrDA:TEC Protocol)

i)

[ESC] X [05H] [01H] [01H]  
\$12.00 [LF]  
\$12.00 [LF]  
214901881186 [LF]  
291890001200 [LF]



ii)

[ESC] X [05H] [01H] [01H]  
\$80 [LF]  
\$80 [LF]  
214901881186 [LF]  
291890001200 [LF]



### 6.5.4 BARCODE FORMAT COMMAND (MSI, ITF, CODE39, NW7) [ESC] XB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the barcode is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Format   | [ESC] XBaa; bbbb, cccc, d, e, ff, gg, hh, ii, jj, k, llll, m, nn, o, p [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Term     | <p>aa: Barcode No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode field.)</p> <p>bbbb: Print origin of X-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>1: MSI<br/>2: Interleaved 2 of 5 (ITF)<br/>3: CODE39 (Standard)<br/>4: NW7</p> <p>e: Type of check digit<br/>1 (Fixed value): Without attaching check digit</p> <p>ff: Narrow bar width<br/>02 to 03: 2 to 3 dots</p> <p>gg: Narrow space width<br/>02 to 03: 2 to 3 dots</p> <p>hh: Wide bar width<br/>05 to 09: 5 to 9 dots</p> <p>ii: Wide space width<br/>05 to 09: 5 to 9 dots</p> <p>jj: Character-to-character space width<br/>02 to 03: 2 to 3 dots<br/><br/>* Only for MSI and ITF, "00" can be set. If any value is set, the printer automatically changes it to "00."</p> <p>k: Rotational angle of barcode<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>llll: Height of barcode<br/>0001 to 0350 (in 0.1 mm units)</p> <p>m: Selection to print numerals under bars<br/>0: Non-print<br/>1: Print</p> |

- nn: Data length (including start/stop codes)  
00 to 32     **NOTE:** *When "00" is designated, the length is equivalent to the data sent by the Data Print Command.*  
*JIS8 code: Data which is delimited by [LF]*  
*Packed BCD code: Data which is delimited by "F"*
- o: Data code  
1: JIS8 code  
2: Packed BCD code (only for IrDA: TEC Protocol)
- p: Fixed data No.  
0 (Fixed value)



### 6.5.5 BARCODE FORMAT COMMAND (JAN8/EAN8, JAN13/EAN13) [ESC] XB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the barcode is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Format   | [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh, iii, j, kk, l, m [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Term     | <p>aa: Barcode No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode field.)</p> <p>bbbb: Print origin of X-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>0: JAN/8EAN8<br/>5: JAN13/EAN13</p> <p>e: Type of check digit<br/>3 (Fixed value): Check digit auto attachment</p> <p>ff: 1-module width<br/>02 to 03 (in units of dots)</p> <p>g: Rotational angle of barcode<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>hhhh: Height of barcode<br/>0001 to 0350 (in 0.1 mm units)</p> <p>iii: Length of guard bar<br/>000 to 050 (in 0.1 mm units)</p> <p>j: Selection to print numerals under bars<br/>0: Non-print<br/>1: Print</p> <p>kk: Data length<br/>07: JAN8/EAN8<br/>12: JAN13/EAN13<br/>00: <b>NOTE:</b> When "00" is designated, the length is equivalent to the data sent by the Data Print Command.<br/><i>JIS8 code: Data which is delimited by [LF]</i><br/><i>Packed BCD code: Data which is delimited by "F"</i></p> <p>l: Data code<br/>1: JIS8 code<br/>2: Packed BCD code (only for IrDA: TEC Protocol)</p> <p>m: Fixed data No.<br/>0 (Fixed value)</p> |

**6.5.6 BARCODE FORMAT COMMAND (EAN128, UCC/EAN128) [ESC] XB**

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the barcode is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Format   | [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh, iii, j, kk, l, m [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Term     | <p>aa: Barcode No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode field.)</p> <p>bbbb: Print origin of X-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>N: EAN128<br/>n: UCC/EAN128</p> <p>e: Type of check digit<br/>3 (Fixed value): Check digit auto attachment</p> <p>ff: 1-module width<br/>02 to 03 (in units of dots)</p> <p>g: Rotational angle of barcode<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>hhhh: Height of barcode<br/>0001 to 0350 (in 0.1 mm units)</p> <p>iii: Length of guard bar<br/>000 (Fixed value)</p> <p>j: Selection to print numerals under bars<br/>0: Non-print<br/>1: Print</p> <p>kk: Data length<br/>00 to 32; only even numbers (for EAN128)<br/>00 or 19 (for UCC/EAN128)</p> <p style="text-align: center;"><b>NOTE:</b> When "00" is designated, the length is equivalent to the data sent by the Data Print Command.<br/>JIS8 code: Data which is delimited by [LF]<br/>Packed BCD code: Data which is delimited by "F"</p> <p>l: Data code<br/>1: JIS8 code<br/>2: Packed BCD code (only for IrDA: TEC Protocol)</p> <p>m: Fixed data No.<br/>0 (Fixed value)</p> |

### 6.5.7 BARCODE FORMAT COMMAND (CODE128)

[ESC] XB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the barcode is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Format   | [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh, iii, j, kkk, l, m [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Term     | <p>aa: Barcode No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode field.)</p> <p>bbbb: Print origin of X-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>9: CODE128</p> <p>e: Type of check digit<br/>3 (Fixed value): Check digit auto attachment</p> <p>ff: 1-module width<br/>02 to 03 (in units of dots)</p> <p>g: Rotational angle of barcode<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>hhhh: Height of barcode<br/>0001 to 0350 (in 0.1 mm units)</p> <p>iii: Length of guard bar<br/>000 (Fixed value)</p> <p>j: Selection to print numerals under bars<br/>0: Non-print<br/>1: Print</p> <p>kkk: Data length<br/>00 to 100 (Both odd and even numbers)</p> <p style="padding-left: 40px;"><b>NOTES:</b> 1. A two-digit value (00 to 99) is also available.<br/>2. When "00" or "000" is designated, the length is equivalent to the data sent by the Data Print Command.</p> <p style="padding-left: 80px;"><i>JIS8 code: Data which is delimited by [LF]<br/>Packed BCD code: Data which is delimited by "F"</i></p> <p>l: Data code<br/>1: JIS8 code<br/>2: Packed BCD code (only for IrDA: TEC Protocol)</p> <p>m: Fixed data No.<br/>0 (Fixed value)</p> |

Examples of using commands in EAN128, UCC/EAN128 and CODE128

⊙ Form storage

[ESC] ID; 01H23H [LF] [NUL] : ID setting  
 [ESC] XO; 01, 1 [LF] [NUL] : Declaration of the start of form storage  
 [ESC] D0360, 0480, 0330 [LF] [NUL] : Label size setting  
 [ESC] XB00; 0000, 0080, N, 3, 2, 0, 0090, 000, 0, 24, 2, 0 [LF] [NUL] : Format of bar code No. 00

{ EAN128: 00 ~ 32  
 { UCC/EAN128: 00 or 19  
 { CODE128: 00 ~ 100

{ 9: CODE128  
 { N: EAN128  
 { n: UCC/EAN128

[ESC] XP [LF] [NUL] : Declaration of the termination of form storage

⊙ Drawing and issue (for IrDA: TEC Protocol)

[STX] 01H 23H 10H X 01H 00H 03H 97H 15H 01H 83H 06H 32H 13H 11H 50H 00H 50H 01H [CRC] [CRC]

Barcode data (971501830632131150005001)  
 (\*1) Check digit of Modulus 10 is not attached by the printer. Therefore, the check digit should be calculated in advance, then be sent as data.

No. of labels to be issued: 3

Transmissive sensor designated, No status response made

Form No.: 1

Packet length (10H = 16 bytes)

Printer ID (0123H)

(\*1) How to calculate the Modulus 10 check digit (When barcode data is 971501830632131150005001.)

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 7 | 1 | 5 | 0 | 1 | 8 | 3 | 0 | 6 | 3 | 2 | 1 | 3 | 1 | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 1 |
| - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ | - | Δ |

Sum up the numbers in the column of '-': 33

33 x 3 (fixed number) = 99

Sum up the numbers in the column of 'Δ': 29

29 x 1 (fixed number) = 29

Add the above two numbers: 99 + 29 = 128

Subtract the lowest digit of 128 from 10 (fixed number): 10 - 8 = 2

The obtained number '2' is attached to the end of the barcode data.

|              |   |   |   |   |   |   |   |   |   |   |   |   |                           |   |   |   |   |   |   |   |   |   |   |   |
|--------------|---|---|---|---|---|---|---|---|---|---|---|---|---------------------------|---|---|---|---|---|---|---|---|---|---|---|
| 9            | 7 | 1 | 5 | 0 | 1 | 8 | 3 | 0 | 6 | 3 | 2 | 1 | 3                         | 1 | 1 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 1 | 2 |
| Barcode data |   |   |   |   |   |   |   |   |   |   |   |   | Check digit of Modulus 10 |   |   |   |   |   |   |   |   |   |   |   |

### 6.5.8 BARCODE FORMAT COMMAND (CUSTOMER BARCODE) [ESC] XB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the barcode is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Format   | [ESC] XBaa; bbbb, cccc, d, e, ff, g, hhhh, iii, j, kk, l, m [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Term     | <p>aa: Barcode No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the barcode field.)</p> <p>bbbb: Print origin of X-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of barcode<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Type of barcode<br/>R: Customer barcode (Postal code for Japan)<br/>S: Highest priority customer barcode (Postal code for Japan)</p> <p>e: Type of check digit<br/>3 (Fixed value): Check digit auto attachment</p> <p>ff: 1-module width<br/>01 to 15 (in units of dots)</p> <p>g: Rotational angle of barcode<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>hhhh: Height of long bars<br/>0001 to 0350 (in 0.1 mm units)</p> <p>iii: Reserved area<br/>000 (Fixed value)</p> <p>j: Reserved area<br/>0 (Fixed value)</p> <p>kk: Data length<br/>00 to 20: Customer barcode<br/>00 to 19: Highest priority customer barcode<br/><b>NOTE:</b> When "00" is designated, the length is equivalent to the data sent by the Data Print Command Data which is delimited by [LF]</p> <p>l: Data code<br/>1 (Fixed value): JIS8 code</p> <p>m: Fixed data No.<br/>0 (Fixed value)</p> |

### 6.5.9 two-dimensional CODE FORMAT COMMAND (PDF417) [ESC] XB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the two-dimensional code is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Format   | [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iii, jj, k, l [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Term     | <p>aa: Two-dimensional code No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the two-dimensional code field.)</p> <p>bbbb: Print origin of X-coordinate of two-dimensional code<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of two-dimensional code<br/>Fixed at 4 digits (in 0.1 mm units)</p> <p>d: Type of two-dimensional code<br/>P: PDF417</p> <p>ee: Security level<br/>00: Level 0<br/>01: Level 1<br/>02: Level 2<br/>03: Level 3<br/>04: Level 4<br/>05: Level 5<br/>06: Level 6<br/>07: Level 7<br/>08: Level 8</p> <p>ff: 1-module width<br/>02 to 03 (in units of dots)</p> <p>gg: No. of columns (strings)<br/>01 to 30</p> <p>h: Rotational angle of two-dimensional code<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>iii: Bar height<br/>0001 to 0100 (in 0.1 mm units)</p> |

jj: Data length  
00 to 99

- NOTES:**
1. A two-digit value (00 to 99) is also available.
  2. When "00" is designated, the length is equivalent to the data sent by the Data Print Command.  
(JIS8 code: Data which is delimited by [LF])  
Data having a max. of 2000 digits is acceptable.
  3. In IrDA: TEC Protocol, when the data length value is set to 250 or more, it can be sent by using the multiple packet format for the Data Print Command in several packets.

k: Data code  
1 (Fixed value): JIS8 code

l: Fixed data No.  
0 (Fixed value)

Examples of using commands in PDF417

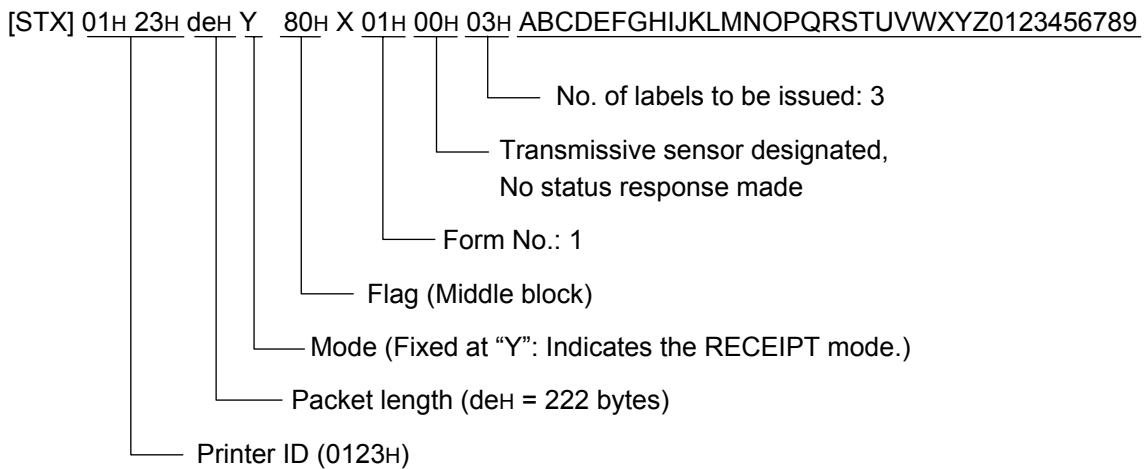
⊙ Form storage

[ESC] ID; 01H23H [LF] [NUL] : ID setting  
 [ESC] XO; 01, 1 [LF] [NUL] : Declaration of the start of form storage  
 [ESC] D0360, 0480, 0330 [LF] [NUL] : Label size setting  
 [ESC] XB00; 0000, 0000, P, 00, 02, 06, 0, 0010, 00, 1, 0 [LF] [NUL] : Format of two-dimensional code No. 00  
 [ESC] XP [LF] [NUL] : Declaration of the termination of form storage

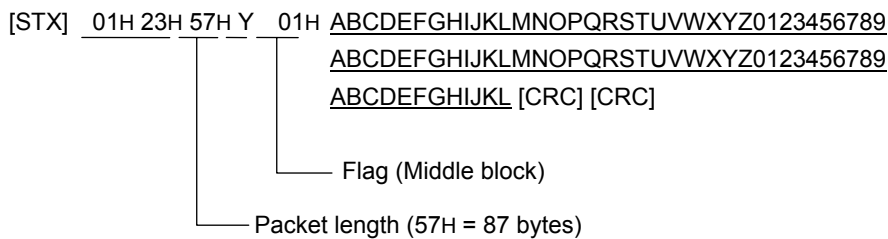
⊙ Drawing and issue (for IrDA: TEC Protocol)

Command packet in the case that 300-byte issue data is designated in PDF417  
 (Since the data length is 250 bytes or more, the data is sent by using the command packet in the RECEIPT mode.)

[Example]



ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789  
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789  
ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789 [CRC] [CRC]





**6.5.10 two-dimensional CODE FORMAT COMMAND (QR CODE) [ESC] XB**

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the two-dimensional code is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Format   | [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkklmm), nn, o, p [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Term     | <p>aa: Two-dimensional code No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the two-dimensional code field.)</p> <p>bbbb: Print origin of X-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>cccc: Print origin of Y-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>d: Type of two-dimensional code<br/>T: QR code</p> <p>e: Designation of error correction level<br/>L: High density level<br/>M: Standard level<br/>Q: Reliability level<br/>H: High reliability level</p> <p>ff: 1-cell width<br/>01 to 09 (in units of dots)</p> <p>g: Selection of mode<br/>M: Manual mode<br/>A: Automatic mode</p> <p>h: Rotational angle of two-dimensional code<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>Mi: Selection of model<br/>(Omissible. If this parameter is omitted, Model 1 is automatically selected.)<br/>i = 1: Model 1<br/>2: Model 2</p> <p>Kj: Mask number<br/>(Omissible. If this parameter is omitted, the number is automatically set.)<br/>i = 0 to 7: Mask number 0 to 7<br/>8: No mask</p> <p>Jkklmm: Connection setting (Omissible. No connection if this parameter is omitted.)<br/>kk = 01 to 16: Value indicating which divided code is connected.<br/>ll = 01 to 16: Number of divided codes<br/>mm = 00 to FF: A value for all data to be printed, to which XOR is applied in units of bytes (Not divided)</p> |

nn: Data length  
00 to 99

- NOTES:**
1. A two-digit value (00 to 99) is also available.
  2. When "00" is designated, the length is equivalent to the data sent by the Data Print Command. It corresponds for up to 2000 digits.

o: Data code  
1 (Fixed value): JIS8 code

p: Data code  
0 (Fixed value)

### 6.5.11 TWO-DIMENSIONAL CODE FORMAT COMMAND (DATA MATRIX) [ESC] XB

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the two-dimensional code is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Format   | [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijj) (, Jkkllmmnnn), ooo, p, q [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Term     | <p>aa: Two-dimensional code No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the two-dimensional code field.)</p> <p>bbbb: Print origin of X-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>cccc: Print origin of Y-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>d: Type of two-dimensional code<br/>Q: Data Matrix</p> <p>ee: ECC type<br/>00: ECC000<br/>05: ECC050<br/>08: ECC080<br/>10: ECC100<br/>14: ECC140<br/>20: ECC200</p> <p>ff: 1-cell width<br/>01 to 09 (in units of dots)</p> <p>gg: Format ID<br/>01: Format ID 1<br/>02: Format ID 2<br/>03: Format ID 3<br/>04: Format ID 4<br/>05: Format ID 5<br/>06: Format ID 6</p> <p>h: Rotational angle of two-dimensional code<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> |

Ciiiijj: No. of cells (Omissible. If this parameter is omitted, it is automatically set.)  
 iii: No. of cells in the X direction 000 to 144  
 jjj: No. of cells in the Y direction 000 to 144

**NOTE:** Cell setting varies according to the ECC type.

|                               | ECC000 to ECC140 | ECC200                                                       |
|-------------------------------|------------------|--------------------------------------------------------------|
| No. of cells to be designated | Odd numbers only | Even numbers only                                            |
| Min./Max. No. of cells        | 9 × 9 to 49 × 49 | 10 × 10 to 144 × 144                                         |
| Rectangular code              | None             | 18 × 8<br>32 × 8<br>26 × 12<br>36 × 12<br>36 × 16<br>48 × 16 |

- When this parameter is omitted, the number of cells is automatically set. Also, when data except for the above values is designated for Nos. of cells in the X and Y directions, the number of cells is automatically set.

Jkkllmmnnn: Connection setting  
 (Omissible: No connection if this parameter is omitted)

kk: Code number 01 to 16  
 ll: No. of divided codes 01 to 16  
 mmm: ID number 001 to 254  
 nnn: ID number 2 001 to 254

**NOTE:** It is effective only when ECC200 is selected.

ooo: Data length  
 000 to 100

- NOTES:**
1. A two-digit value (00 to 99) is also available.
  2. When "00" is designated, the length is equivalent to the data sent by the Data Print Command (data which is delimited by [LF].)
  3. When "00" is designated, the length is equivalent to the data sent by the Data Print Command. It corresponds for up to 2000 digits.

p: Data code  
 1 (Fixed value): JIS8 code

q: Reserved area  
 0: Fixed value

### 6.5.12 TWO-DIMENSIONAL CODE FORMAT COMMAND (MIRCOPDF417) [ESC] XB

|          |                                                                                                                                        |
|----------|----------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the two-dimensional code is to be printed and how it is to be printed. |
|----------|----------------------------------------------------------------------------------------------------------------------------------------|

|        |                                                                     |
|--------|---------------------------------------------------------------------|
| Format | [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iii, jjj, k, l [LF] [NUL] |
|--------|---------------------------------------------------------------------|

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Term | <p>aa: Two-dimensional code No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the two-dimensional code field.)</p> <p>bbbb: Print origin of X-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>cccc: Print origin of Y-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>d: Type of two-dimensional code<br/>X: MicroPDF417</p> <p>ee: Security level<br/>00: Fixed value</p> <p>ff: 1-module width<br/>01 to 09 (in units of dots)</p> <p>gg: No. of columns/rows<br/>01 to 38</p> <p>h: Rotational angle of two-dimensional code<br/>0: 0°<br/>1: 90°<br/>2: 180°<br/>3: 270°</p> <p>iii: Bar height<br/>0001 to 0100 (in units of 0.1 mm)</p> <p>jjj: Data length<br/>000 to 100</p> <p><b>NOTES:</b></p> <ol style="list-style-type: none"> <li>1. A two-digit value (00 to 99) is also available.</li> <li>2. When "00" is designated, the length is equivalent to the data sent by the Data Print Command (data which is delimited by [LF].)</li> <li>3. When "00" is designated, the length is equivalent to the data sent by the Data Print Command. It corresponds for up to 366 digits.</li> </ol> <p>k: Data code<br/>1 (Fixed value): JIS8 code</p> <p>l: Reserved area<br/>0 (Fixed value)</p> |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 6.5.13 TWO-DIMENSIONAL CODE FORMAT COMMAND (MAXICODE) [ESC] XB

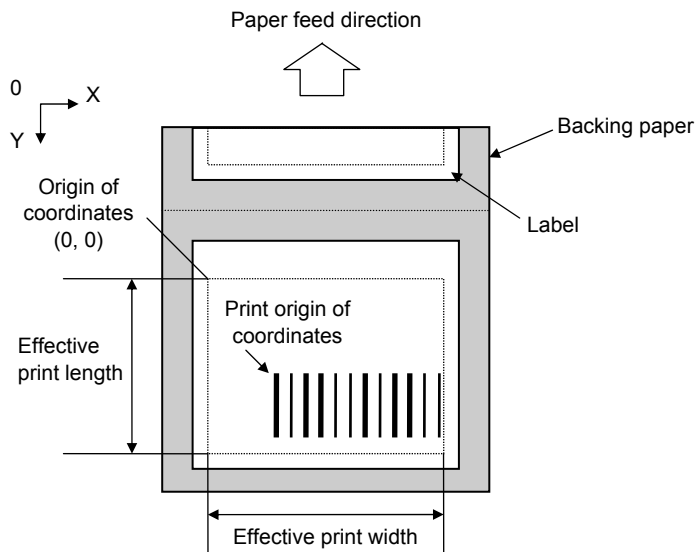
|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the format to indicate the position on the label, at which the two-dimensional code is to be printed and how it is to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format   | [ESC] XBaa; bbbb, cccc, d, e (, Jffgg) (, Zh), iii, j, k [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Term     | <p>aa: Two-dimensional code No.<br/>00 to 99<br/>(The same No. must not be used in one form for the bit map font field, the outline font field, and the two-dimensional code field.)</p> <p>bbbb: Print origin of X-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>cccc: Print origin of Y-coordinate of the two-dimensional code<br/>Fixed at 4 digits (in units of 0.1 mm)</p> <p>d: Type of two-dimensional code<br/>Z: Maxicode</p> <p>e: Mode selection<br/>2: Mode 2<br/>3: Mode 3<br/>4: Mode 4<br/>6: Mode 6</p> <p>Jffgg: Connection setting (Omissible. If omitted, no connection is made.)<br/>ff: Code number 01 to 08<br/>gg: No. of divided codes 01 to 08</p> <p>Zh: Attachment of Zipper block and Contrast block<br/>(Omissible. If omitted, the Zipper block and Contrast block are not attached.)<br/>h: 0: No attachment of Zipper block and Contrast block<br/>1: Attachment of Zipper block and Contrast block<br/>2: Attachment of Zipper block<br/>3: Attachment of Contrast block</p> <p>iii: Data length<br/>000 to 100<br/><b>NOTES:</b> 1. A two-digit value (00 to 99) is also available.<br/>2. When "00" is designated, the length is equivalent to the data sent by the Data Print Command (data which is delimited by [LF].)</p> <p>j: Data code<br/>1 (Fixed value): JIS8 code</p> <p>k: Reserved area<br/>0 (Fixed value)</p> |

**Explanation**

(1) Two-dimensional code No.

The data in the Data Print Command (X) is selected and linked in the order of this barcode/two-dimensional code No. (The formats of barcode/two-dimensional code Nos. 00 and 01 are linked to the first and second data, respectively. In the same order, the format is linked to the data.) Therefore, the Nos. of the bit map font character string, the outline font character string, and the barcode/two-dimensional code, should be consecutive, starting from 00 (in ascending order). The same No. must not be used in one form for the bit map font character string field, the outline font character string field, and the barcode/two-dimensional code field.

(2) Print origin of coordinates

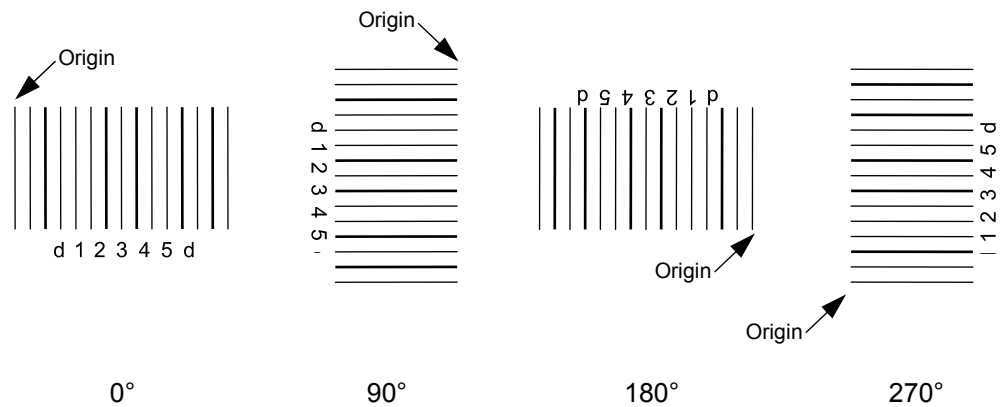


(3) Type of check digit

The check digit is automatically attached according to the type designation as shown below.

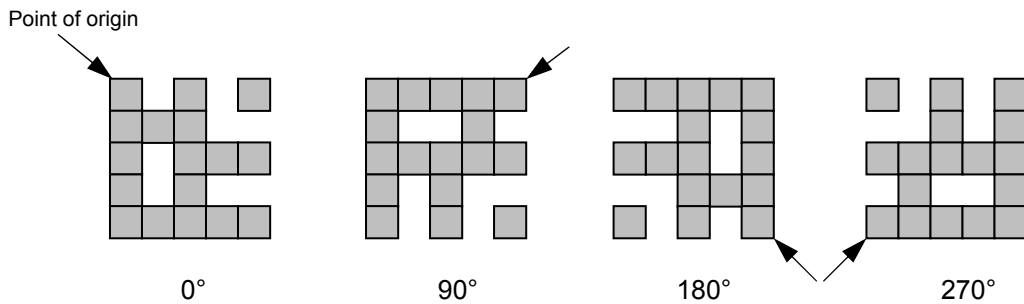
| Barcode type / C/D type | NW7, CODE39, Interleaved 2 of 5 | JAN8/EAN8, JAN13/EAN13        | EAN128, UCC/EAN128, CODE128  |
|-------------------------|---------------------------------|-------------------------------|------------------------------|
| 1                       | Without attaching check digit   | No designation                | No designation               |
| 3                       | No designation                  | Auto attachment of Modulus 10 | Auto attachment of PSEUDO103 |

(4) Rotational angles of a barcode

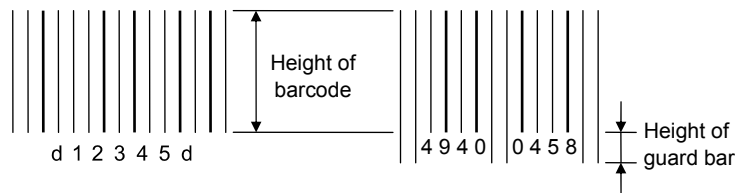


**NOTE:** If a barcode is rotated at 90° or 270°, the print density may become lower in relation to the bar height. A barcode with a height of 14 mm or less should be used. When a barcode with a height of over 14 mm is used, the print quality is not guaranteed.

Rotational angle of a two-dimensional code



(5) Barcode height



(6) Numerals under bars

Numerals are provided under bars depending on the parameter for numerals under bars. Standard fonts are used.

(7) Since the start/stop codes are not automatically attached when using NW7, they should be included in the data to be sent as required. Although no start/stop codes are attached to data, a barcode is drawn.

When using CODE39, the first and last characters of the data are checked. Unless the characters are not “\*,” “\*” is automatically attached. When the host sends data while attaching “\*” as the start/stop codes, a barcode is drawn.

(8) When Interleaved 2 of 5 is selected and the number of data length digits is odd, 0 is automatically added to the beginning of the data, to change the number of data length digits to even.



(9) Explanation for QR code

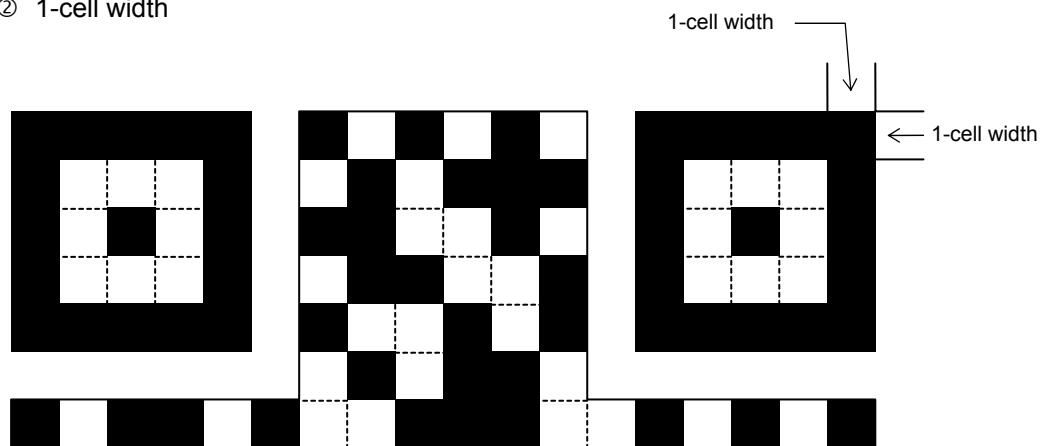
① Error correction level

The QR code contains functions to detect and correct an error. If one of the data characters is damaged, the information can be restored when this code is read.

There are 4 levels that can be designated. The level should be specified according to usage. The general correction ability is as follows.

| Level                  | Error correction ability | Overhead by correcting an error |
|------------------------|--------------------------|---------------------------------|
| High density level     | Low<br>↑<br>↓<br>High    | 7%                              |
| Standard level         |                          | 15%                             |
| Reliability level      |                          | 25%                             |
| High reliability level |                          | 30%                             |

② 1-cell width



③ Selection of mode

All codes including alphanumerics, symbols, and Kanji can be used in one QR code. Manual mode or automatic mode can be selected to perform the operation. When automatic mode is selected, FFH cannot be used. However, this data can be used in manual mode.

④ Selection of model

- Model 1: Original specification
- Model 2: Extended specification which enhances the function of position correction and can contain a large amount of data.

⑤ Mask number

To be sure the QR code is read, it is preferable that white and black modules are arranged in this symbol in a balanced manner. This prevents the bit pattern "1011101", which is characteristically seen in the position detecting pattern, from appearing in the symbol as much as possible.

The mask number is 0 to 7. The pattern is determined by placing each masking pattern for the mask number upon the module pattern. When the mask number is set to 8, masking is not performed. When the parameter is omitted, the most appropriate mask number is automatically selected to perform masking.

⑥ Connection setting

For QR code, data can be divided into several codes. Even though there is only a narrow print space, the code can be entered in the space by dividing the code. The data can be divided into a max. of 16 codes. Parity data is obtained by XORing all input data in units of bytes before dividing. The input data is calculated based on shift JIS for Kanji, or on JIS8 for others. Examples are shown below:

“0123456789 日本 ” is divided into “0123”, “4567”, and “89 日本 .”

|            |                         |                 |               |
|------------|-------------------------|-----------------|---------------|
| Code No. 1 | No. of divided codes: 3 | Parity data: 84 | Data “0123”   |
| Code No. 2 | No. of divided codes: 3 | Parity data: 84 | Data “4567”   |
| Code No. 3 | No. of divided codes: 3 | Parity data: 84 | Data “89 日本 ” |

\* The parity data is the XORed value for “0123456789 日本 .”

30 31 32 33 34 35 36 37 38 39 93 FA 96 7B = 85

Note

When the QR code is printed, note the setting for the coordinates positions. If the specified coordinates are close to the maximum effective print length, the QR code may not be included within the maximum effective print length, depending on the 1-cell width or the data count. If the QR code is not included within the maximum effective print width, one part of the printed QR code may be missing. Be sure to check to see if the QR code is included within the effective print length.

(For example, when the maximum effective print length is 97 mm, if the Y-coordinate of the QR code is set to 90 mm, one part of the printed QR code may be missing, depending on the QR code size.

(10) Security level

The PDF417 contains a function to correct a code reading error using an error correcting code word and restore normal data. The security level should be designated according to usage to perform the error correction function.

| Security level | Error Correction Ability                                                                                                                                                                                                                                                             | No. of error correction code words |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Level 0        | <div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">Low</div> <div style="font-size: 2em; margin: 0 auto;">↑</div> <div style="border: 1px solid black; padding: 2px; width: 40px; margin: 0 auto;">High</div> </div> | 0                                  |
| Level 1        |                                                                                                                                                                                                                                                                                      | 2                                  |
| Level 2        |                                                                                                                                                                                                                                                                                      | 6                                  |
| Level 3        |                                                                                                                                                                                                                                                                                      | 14                                 |
| Level 4        |                                                                                                                                                                                                                                                                                      | 30                                 |
| Level 5        |                                                                                                                                                                                                                                                                                      | 62                                 |
| Level 6        |                                                                                                                                                                                                                                                                                      | 126                                |
| Level 7        |                                                                                                                                                                                                                                                                                      | 254                                |
| Level 8        |                                                                                                                                                                                                                                                                                      | 510                                |

(11) No. of columns (strings)

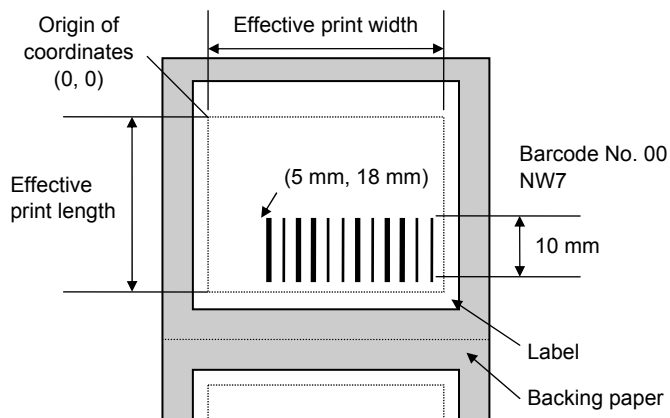
The number of lines is variable in the PDF417. The line length (No. of data strings) is also variable. Therefore, a symbol can be created in a form that can be easily printed, by changing the proportion of the height and width.

The number of columns (data strings) is variable between 1 and 30.

If a small value for the number of columns is set when the data is large and the security level is high, drawing may not be performed. This is because the number of lines exceeds 90 when the number of columns becomes small. If the number of lines exceeds 90, a label is issued without being printed.

(When the PDF417 is used, the number of lines of symbols is limited from 3 to 90.)

Example



[ESC] XB00 ; 0050, 0180, 4, 1, 02, 02, 05, 05, 02, 0, 0100, 0, 07, 1, 0 [LF] [NUL]

## 6.6 COMMANDS RELATED TO ISSUE AND FEED

### 6.6.1 DATA PRINT COMMAND

X

Function

Draws or prints the data.

Format

[IrDA: TEC Protocol]

Xabcddd --- eee --- nnn ---

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

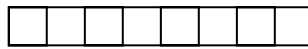
[ESC] Xabcddd --- eee --- nnn --- [NUL]

Term

a: Form No.

01H to 14H (1 to 20)

7 6 5 4 3 2 1 0



Form No. (Bit 0 to Bit 6) 01H to 14H (1 to 20)

Reprint key enabled or disabled (Bit 7)

Selection of the reprint key function (Firmware V1.1 or greater)

0: Enabled

1: Disabled

When the form No. is 81H to 8AH (1 to 10) and if an error occurs during printing, the reprint key will be enabled until a label is successfully issued.

When the form No. is 8BH to 94H (11 to 20), the reprint key will be disabled if an error occurs during printing.

b: Sensor designation and ACK (IrDA: TEC Protocol) /status transmission (IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth) to notify the issue end

00H: Transmissive sensor, No ACK/status transmission

01H: Transmissive sensor, ACK/status transmission

10H: Reflective sensor, No ACK/status transmission

11H: Reflective sensor, ACK/status transmission

20H: No sensor designation, No ACK/status transmission

21H: No sensor designation, ACK/status transmission

c: No. of labels to be issued

01H to FFH (1 to 255)

Even in the strip issue mode, the designated number of labels is printed.

ddd ---: Data of character/barcode/2-D code No. 00

eee ---: Data of character/barcode/2-D code No. 01

nnn ---: Data of character/barcode/2-D code No. nn

When a delimiter is required, it should be added to the end of data. (Refer to "Explanation.")

Explanation

- (1) When the printer receives this command, the following operations will be performed.
  - ① The printer clears the drawing buffer.
  - ② The printer links the form to the data.
  - ③ The printer draws the data in the drawing buffer.
  - ④ The printer draws the data if invocation of graphics is set in the form.
  - ⑤ The printer sets the fine adjustment values for print density/position stored in the form.
  - ⑥ The printer starts printing
- (2) Data is indicated in JIS8 code or packed BCD code. The type of data code is set by the Bit Map Font Field Command, the Outline Font Field Command, or the Barcode/Two-dimensional Code Format Command.
- (3) When the length and the data code set by the Bit Map Font Field Command, the Outline Font Field Command, or the Barcode/Two-dimensional Code Format Command is "00" and JIS8 code, respectively, the delimiter [LF] (0AH) should be entered at the end of the field data. When the packed BCD is used as the data code, the delimiter "F" (4 bits) should be entered at the end of the field data. When the data length stored in the form is anything other than "00", a delimiter such as [LF] or "F" should not be attached, since the length of the data is linked.
- (4) If the length of the data corresponding to one field (including a delimiter) is an odd number of digits when the packed BCD code is used, the last 4 bits of the final data in the field should be "0".
- (5) When there is data which does not match the type of barcode/two-dimensional code in the data string for the barcode/two-dimensional code, the barcode/two-dimensional code is not drawn. When the barcode/two-dimensional code digit is fixed, and the type of barcode/two-dimensional code does not match the number of the data digit, the barcode/two-dimensional code is not drawn.
- (6) If an error occurs while printing two or more labels, the printer discards the remaining received data and waits for a command, after the error is cleared by pressing the PAUSE key.
- (7) If the form which corresponds to the form No. designated is not stored, a syntax error occurs.
- (8) When the form No. is other than 01H to 14H, the Data Print Command is discarded.
- (9) When the number of labels to be printed is other than 01H to FFH, a syntax error occurs.
- (10) If the battery capacity becomes low while printing two or more labels, the printer may stop after issuing every label (for Max. 7 seconds).

- (11) Automatic status transmission (IrDA: IrCOMM, IrDA: IrOBEX, RS-232C, Bluetooth, Wireless LAN)

When the status response is designated, the printer automatically sends the printer status and the battery status after issuing labels.

Data to be sent (Fixed at 5 bytes)

| STX | Printer ID |     | Printer status | Battery status |
|-----|------------|-----|----------------|----------------|
| 02H | xxH        | xxH | xxH            | xxH            |

Printer ID.....2-byte hex data (in order from High to Low)

Printer status.....Printer status is indicated in 1-byte data.

- 00H: Normal state (idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Operating
- 0DH: Normal end + Label end
- 0EH: Flash ROM storage area full state
- 0FH: Wait for strip
- 10H: Normal issue end
- 14H: Pause state
- 19H: Ambient temperature error
- 32H: Abnormal battery temperature
- 33H: Battery excessive temperature
- 37H: Charging error
- 38H: Bluetooth setting successfully completed
- 39H: Bluetooth setup error (including initialization error)
- 45H: Wait for battery recovery
- 46H: Wait for head temperature reduction
- 47H: Wait for motor temperature reduction
- 55H: Writable character/PC command save mode

0DH (Normal issue end + Label end) is a state when the printer runs out of labels, after the effective print length is printed.

Status in the compatible mode for B-SP series

- 00H: Normal state (idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end (including ambient temperature error)
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature  
( including abnormal battery temperature and battery excessive temperature )
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Printer operating  
( including the following statuses: wait for strip, pause state, writable character/PC command save mode, wait for battery recovery and wait for print head/motor temperature reduction )
- 0DH: Normal end + Label end
- 0EH: Flash ROM storage area full state
- 10H: Normal issue end
- 37H: Charging error
- 38H: Bluetooth setting successfully completed
- 39H: Bluetooth setup error (including initialization error)

Battery status..... The battery charge status is indicated in 5 levels.

(B-EP2DL)

- 01H: 7.2 V or less (Print failure)
- 02H: 7.3 V to 7.4 V  
(Remaining No. of printable labels: Approx. 1 to 30)
- 03H: 7.5 V to 7.7 V  
(Remaining No. of printable labels: Approx. 30 to 150)
- 04H: 7.8 V to 7.9 V  
(Remaining No. of printable labels: Approx. 150 to 300)
- 05H: 8.0 V to 8.4 V  
(Remaining No. of printable labels: Approx. 300 min.)

(B-EP4DL)

- 01H: 14.0 V or less (Print failure)
- 02H: 14.1 V to 14.6 V  
(Remaining No. of printable labels: Approx. 1 to 30)
- 03H: 14.7 V to 15.2 V  
(Remaining No. of printable labels: Approx. 30 to 150)
- 04H: 15.3 V to 15.9 V  
(Remaining No. of printable labels: Approx. 150 to 300)
- 05H: 16.0 V to 16.8 V  
(Remaining No. of printable labels: Approx. 300 min.)

\* The remaining number of printable labels may vary according to the contents to be printed and the ambient environment.

- (13) If an error occurs when 99% of print data has been printed, pressing the FEED key after clearing the error causes the printer to reprint, even when the restart key is set to disabled and the form number is selected from 1 to 10.
- (14) If an error occurs before printing, the printer will not reprint by pressing the FEED key after clearing the error, when the restart key is set to disabled and the form number is selected from 11 to 20.
- (15) In case of “normal issue end + label end”, pressing the FEED key after clearing the error causes the printer to reprint even when the restart key is set to disabled and the form number is selected from 1 to 10.
- (16) When the sensor is specified, even if a gap or a black mark is detected within less than 90% of the effective print length specified by the Label Size Set Command, it is ignored.

• The definition of packed BCD code

| Code                   | Character string      |          |          |        | Barcode                                       |     |        |         |
|------------------------|-----------------------|----------|----------|--------|-----------------------------------------------|-----|--------|---------|
|                        | Standard/Presentation | Bold     | Price    | Others | EAN8/13<br>ITF<br>EAN128<br>UCC/EAN128<br>MIS | NW7 | CODE39 | CODE128 |
| 0000 (0)<br>~ 1001 (9) | “0” ~ “9”             |          |          |        |                                               |     |        |         |
| 1010 (A)               | Reserved              | “-“      | “\$”     | “£”    | Reserved                                      | “a” | “*”    | “ ”     |
| 1011 (B)               | Reserved              | Reserved | Reserved | “p”    | Reserved                                      | “b” | “- ”   | “ ”     |
| 1100 (C)               | “.”                   | Reserved | “.”      | “.”    | Reserved                                      | “c” | “.”    | “ ”     |
| 1101 (D)               | “ ”                   | “ ”      | “ ”      | “ ”    | Reserved                                      | “d” | “ ”    | “ ”     |
| 1110 (E)               | Reserved              |          |          |        |                                               |     |        |         |
| 1111 (F)               | Delimiter             |          |          |        |                                               |     |        |         |

\* E (H) is reserved for expansion. F (H) is used as the delimiter for each field in the Data Print Command (only when the data length and the data code are “00” and “Packed BCD code”, respectively).

[Example] Barcode data = “a 1 2 3 4 5 6 7 8 9 0 d”

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| [A1H] | [23H] | [45H] | [67H] | [89H] | [0DH] |
| a1    | 23    | 45    | 67    | 89    | 0d    |



- When the manual mode is selected in the Format Command for a QR code
  - Numeric mode, alphanumeric and symbol mode, Kanji mode

|                |                    |
|----------------|--------------------|
| Mode selection | Data to be printed |
|----------------|--------------------|

- Binary mode

|                |                                   |                    |
|----------------|-----------------------------------|--------------------|
| Mode selection | No. of data strings<br>(4 digits) | Data to be printed |
|----------------|-----------------------------------|--------------------|

- Mixed mode

|      |             |      |             |      |
|------|-------------|------|-------------|------|
| Data | “,” (comma) | Data | “,” (comma) | Data |
|------|-------------|------|-------------|------|

The QR code can handle all codes including alphanumerics, symbols and Kanji. Since data compression rate varies according to codes, the code to be used is designated when the mode is selected.

| Mode | Code                   | Details                                 |
|------|------------------------|-----------------------------------------|
| N    | Numerals               | 0 to 9                                  |
| A    | Alphanumerics, symbols | A to Z 0 to 9 space<br>\$ % * + - . / : |
| B    | Binary (8-bit)         | 00H to FFH                              |
| K    | Kanji                  | Shift JIS                               |

If mixed mode is selected, up to 200 modes can be selected in a QR code.

- When the automatic mode is selected in the Format Command for a QR code.

|                    |
|--------------------|
| Data to be printed |
|--------------------|

① How to send the control code data

|           |   |                |
|-----------|---|----------------|
| NUL (00H) | = | > @ (3EH, 40H) |
| SOH (01H) | = | > A (3EH, 41H) |
| STX (02H) | = | > B (3EH, 42H) |
| ⋮         |   |                |
| GS (1DH)  | = | > ] (3EH, 5DH) |
| RS (1EH)  | = | > ^ (3EH, 5EH) |
| US (1FH)  | = | > _ (3EH, 5FH) |

② How to send the special codes

|         |   |                |
|---------|---|----------------|
| > (3EH) | = | > 0 (3EH, 30H) |
|---------|---|----------------|

[Transfer code]

|   | 0   | 1   | 2  | 3 | 4 | 5 | 6 | 7   | 8 | 9 | A | B | C | D | E | F |
|---|-----|-----|----|---|---|---|---|-----|---|---|---|---|---|---|---|---|
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p   |   |   |   |   |   |   |   |   |
| 1 | SOH | DC1 | !  | 1 | A | Q | a | q   |   |   |   |   |   |   |   |   |
| 2 | STX | DC2 | "  | 2 | B | R | b | r   |   |   |   |   |   |   |   |   |
| 3 | ETX | DC3 | #  | 3 | C | S | c | s   |   |   |   |   |   |   |   |   |
| 4 | EOT | DC4 | \$ | 4 | D | T | d | t   |   |   |   |   |   |   |   |   |
| 5 | ENQ | NAK | %  | 5 | E | U | e | u   |   |   |   |   |   |   |   |   |
| 6 | ACK | SYN | &  | 6 | F | V | f | v   |   |   |   |   |   |   |   |   |
| 7 | BEL | ETB | '  | 7 | G | W | g | w   |   |   |   |   |   |   |   |   |
| 8 | BS  | CAN | (  | 8 | H | X | h | x   |   |   |   |   |   |   |   |   |
| 9 | HT  | EM  | )  | 9 | I | Y | i | y   |   |   |   |   |   |   |   |   |
| A | LF  | SUB | *  | : | J | Z | j | z   |   |   |   |   |   |   |   |   |
| B | VT  | ESC | +  | ; | K | [ | k | {   |   |   |   |   |   |   |   |   |
| C | FF  | FS  | ,  | < | L | \ | l |     |   |   |   |   |   |   |   |   |
| D | CR  | GS  | -  | = | M | ] | m | }   |   |   |   |   |   |   |   |   |
| E | SO  | RS  | •  | > | N | ^ | n | ~   |   |   |   |   |   |   |   |   |
| F | SI  | US  | /  | ? | O | _ | o | DEL |   |   |   |   |   |   |   |   |

\* The shaded parts are Japanese. They are omitted here.

When the automatic mode is selected in the Format Command, FFH data cannot be used. It is available when the manual mode is selected.

Examples of data designation for QR code

- ① Alphanumeric mode: ABC123

A A B C 1 2 3  
 ↑  
 └─ Data to be printed  
 └─ Designation of mode

- ② Binary mode: 01H, 03H, 05H

B 0 0 0 6 > A > C > E  
 ↑  
 └─ Data to be printed  
 └─ No. of data strings  
 └─ Designation of mode

- ③ Mixed mode

Numeric mode : 123456  
 Kanji mode : Kanji data  
 Binary mode : aア iイ uウ eエ oオ  
 Alphanumeric mode : ABC

N 1 2 3 4 5 6, K Kanji data, B 0 0 1 0 aア iイ uウ eエ oオ, A A B C  
 ↑ Data to be printed ↑ Data to be printed ↑ No. of data strings ↑ Data to be printed ↑ Data to be printed  
 └─ Designation of mode

- ④ Automatic mode

When the data above (③) is designated in automatic mode:

1 2 3 4 5 6 Kanji data aア iイ uウ eエ oオ A B C  
 Data to be printed

## 6.7 COMMANDS RELATED TO FORMAT

### 6.7.1 FLASH MEMORY STORAGE AREA FORMAT COMMAND [ESC] J1

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Formats (Initializes) the form storage area in flash memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Format      | [ESC] J1; a [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Term        | <p>a: Format (Initialization) designation</p> <p>A: Form storage area</p> <p>B: Writable character storage area</p> <p>C: Graphic storage area</p> <p>D: All storage areas (Form, Writable character, Graphic)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Explanation | <p>(1) When the storage area in flash ROM becomes full, the old data is automatically deleted and only the newest data is left. Only the form storage area in flash ROM can be forcefully cleared by this command. However, if this command is sent, all data of the stored forms, including the newest data, is deleted (initialized).</p> <p>(2) The remaining capacity of flash memory after formatting is displayed on the LCD.</p> <p>(3) Whenever already registered data (PC saving, writable character or logo) is registered again, memory is consumed unless a format command is sent.</p> <p>(4) After a format command is sent, the image buffer is cleared automatically.</p> |
| Note        | (1) Since the writable character storage area is shared by the LABEL and TPCL modes, writable characters registered in TPCL mode are erased.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Refer to    | Form Store Start Command ([ESC] XO)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**6.7.2 STORAGE AREA ALLOCATE COMMAND [ESC] XF**

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Allocates the storage area in the flash ROM on the CPU board.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Format   | [ESC] XF; aa, bb, cc (, dd, ee) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Term     | <p>aa: Reserved<br/>00 to 14</p> <p>bb: Size of bit map writable character storage area<br/>00 to 50 (0 KB to 3,200 KB) (in units of 64 KB)</p> <p>cc: Size of BASIC file storage area<br/>00 to 14 (0 KB to 896 KB) (in units of 64 KB)<br/>AA: The current BASIC file storage area and contents are retained.</p> <p>dd: Size of form storage area<br/>(Omissible. If omitted, the contents are retained.)<br/>00 to 14 (0 KB to 896 KB) (in units of 64 KB)</p> <p>ee: Size of graphic storage area<br/>(Omissible. If omitted, the contents are retained.)<br/>00 to 03 (0 KB to 192 KB) (in units of 64 KB)</p> |

Explanation

- (1) The total capacity of the storage area in flash ROM is variable from 1,024 to 3,200 KB.  
\* Variable with the two-byte font installed

|                                     |          |
|-------------------------------------|----------|
| Kanji                               | 1,344 KB |
| Chinese                             | 1,024 KB |
| Korean                              | 2,112 KB |
| Without the two-byte font installed | 3,200 KB |

- (2) Allocation priority is assigned as follows:

|                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------|
| ① All parameters<br>Writable character > BASIC > Form > Graphic > PC save                                         |
| ② Omissible parameters (, dd, ee) are omitted<br>Form > Graphic > Writable character > BASIC > PC save            |
| ③ BASIC is retained (AA)<br>BASIC > Writable character > Form > Graphic > PC save                                 |
| ④ BASIC is retained, or omissible parameters are omitted<br>Form > Graphic > BASIC > Writable character > PC save |

- (3) When the above command is received, the entire area in flash ROM on the CPU board is cleared. However, omitted parameters are not cleared.

[Example of allocation]

- ⊙ In case that the size of BASIC file storage area is set in a range of “00” to “14”:
- (1) The storage areas are allocated in the following order of precedence – the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area. After these storage areas are allocated using the above command, the remaining area is used for the PC save area.
  - (2) If the sum of the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area, specified using this command, is the maximum allocable capacity, the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area are allocated as specified, respectively. In this case, however, there is no PC save area.
  - (3) If the sum of the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area, specified using this command, exceeds the maximum allocable capacity, the bit map writable character storage area is allocated as specified with the highest priority. Then, the remaining area is allocated to the BASIC file storage area. If there is still remaining area after the bit map writable character storage area and the BASIC file storage area are allocated, it is used for the form storage area. If there is still remaining area, then it is used for the graphic storage area. There is no PC save area. However, the form storage area and the graphic storage area are omitted, the current area is retained.
  - (4) When “00” (0 KB) is specified for each of the bit map writable character storage area, the BASIC file storage area, the form storage area and the graphic storage area, the maximum allocable capacity is used for the PC area. However, the form storage area and the graphic storage area are omitted, the current area is retained.
  - (5) When the maximum allocable capacity is specified for the bit map writable character storage area, the entire storage area is occupied by that area. However, the form storage area and the graphic storage area are omitted, the current area is retained.
  - (6) Any numeric value specified in aa (Reserved) is ignored. However, 2-digit values are possible.

Refer to

- Writable Character data Store Command ([ESC] XD)
- Form Store Start Command ([ESC] XO)
- Flash Memory Storage Area Format Command ([ESC] J1)

Example

The respective area is set to as follows:

|                                          |        |
|------------------------------------------|--------|
| Bit map writable character storage area: | 512 KB |
| BASIC file storage area:                 | 0 KB   |
| Form storage area:                       | 192 KB |
| Graphic storage area:                    | 64 KB  |

PC save area:  $896 \text{ KB} - 512 \text{ KB} - 0 \text{ KB} - 192 \text{ KB} - 64 \text{ KB} = 128 \text{ KB}$   
(Format = [ESC] XF; 00, 08, 00, 03, 01 [LF] [NUL])

When “14 (896 KB)” is specified for any of the formats, the entire storage area is occupied by that area.

For example, if “14” is specified for the bit map writable character storage area, the entire storage area is used only for the bit map writable character storage area. Any area other than the bit map writable character storage area cannot be allocated.

## 6.8 COMMANDS RELATED TO WRITABLE CHARACTERS

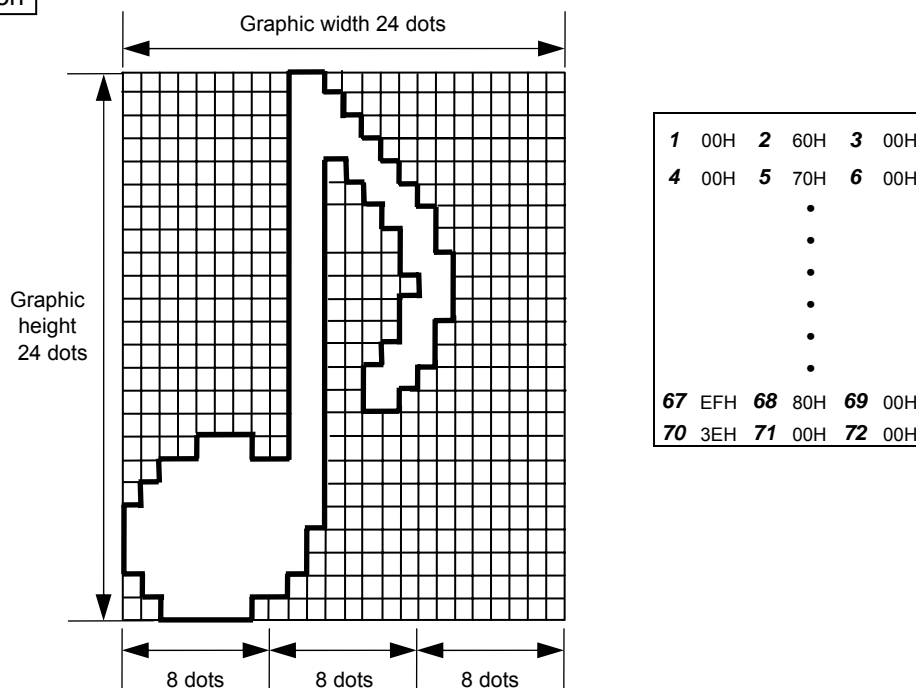
### 6.8.1 WRITABLE CHARACTER DATA STORE COMMAND [ESC] XD

**Function** Stores writable characters and logos into flash memory.

**Format** [ESC] XD; aa, bbb --- bbb [LF] [NUL]

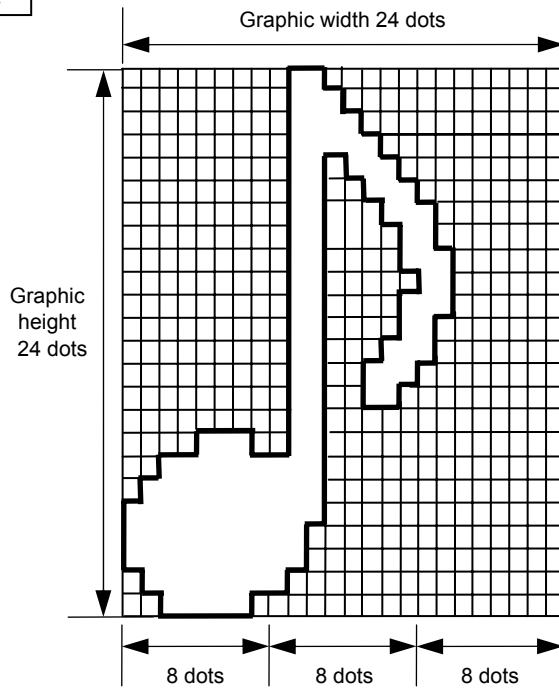
**Term** aa: Writable character code  
FF40H to FF71H  
bbb---bbb: Writable character data (Fixed at 72 bytes)

**Explanation**



- (1) The writable character data should be separated into units of 8 dots and sent in the above order (1 to 72).
- (2) The writable character data is 00H to FFH.
- (3) The number of dots of a writable character width and a writable character height are fixed at 24 dots. Dots with no data are transmitted as data 0. 72-byte data should be sent.
- (4) Max. 50 types of writable character data can be stored. The writable character data is backed up in memory (even if the power is turned off).
- (5) Writable character data is assigned from FF40H to FF71H. Therefore, to read the code, the code (2 bytes) which was stored by this command should be designated.
- (6) A new writable character can be stored in codes which have been stored in an already existing code.

Example



```
[ESC] XD; <FFH> <40H>,
[00H] [60H] [00H] [00H] [70H] [00H] [00H] [78H] [00H]
[00H] [7CH] [00H] [00H] [6EH] [00H] [00H] [67H] [00H]
[00H] [63H] [80H] [00H] [61H] [80H] [00H] [61H] [C0H]
[00H] [60H] [C0H] [00H] [61H] [C0H] [00H] [61H] [80H]
[00H] [63H] [80H] [00H] [67H] [C0H] [00H] [66H] [00H]
[0FH] [60H] [00H] [0EH] [60H] [00H] [3FH] [E0H] [00H]
[7FH] [FEH] [00H] [FFH] [E0H] [00H] [FFH] [C0H] [00H]
[FFH] [C0H] [00H] [EFH] [80H] [00H] [3EH] [00H] [00H]
[LF] [NUL]
```

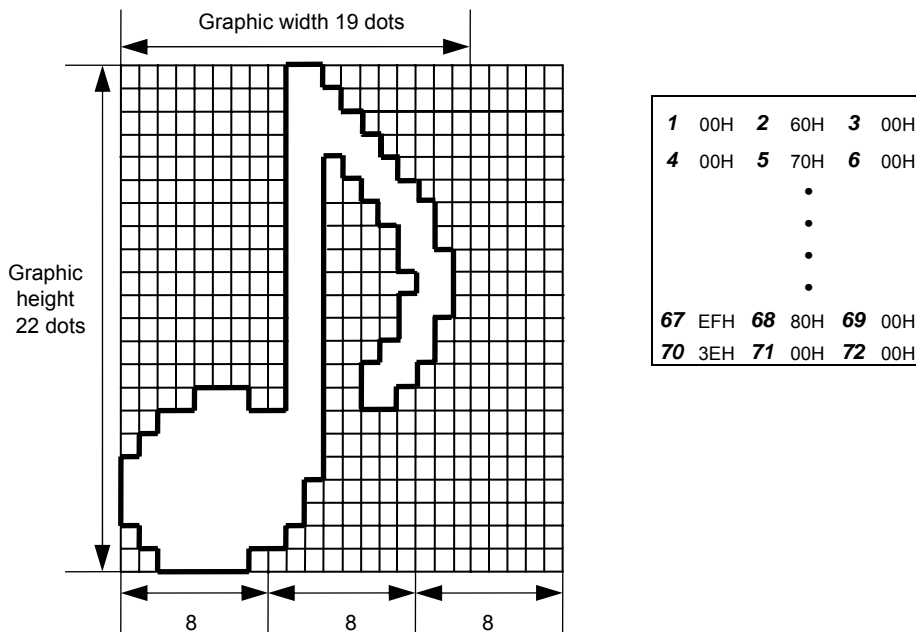
## 6.9 COMMANDS RELATED TO GRAPHICS

### 6.9.1 GRAPHIC DATA STORE COMMAND

[ESC] SG

| Function     | Stores the graphic data on the printer.                                                                                                                                                                                                                                                                                                                                                                                                                           |  |                        |              |     |              |     |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------|--------------|-----|--------------|-----|
| Format       | [ESC] SG ; a, bbbb, cccc, ddd --- ddd [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                        |              |     |              |     |
| Term         | <p>a: Graphic No.<br/>1 to 2</p> <p>bbbb: No. of graphic width dots to be stored<br/>0001 to 1248 (in units of dots)</p> <table border="1"> <thead> <tr> <th></th> <th>Max. No. of width dots</th> </tr> </thead> <tbody> <tr> <td>B-EP2DL-GHxx</td> <td>384</td> </tr> <tr> <td>B-EP4DL-GHxx</td> <td>832</td> </tr> </tbody> </table> <p>cccc: No. of graphic height dots to be stored<br/>0001 to 9999 (in units of dots)</p> <p>ddd --- ddd: Graphic data</p> |  | Max. No. of width dots | B-EP2DL-GHxx | 384 | B-EP4DL-GHxx | 832 |
|              | Max. No. of width dots                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                        |              |     |              |     |
| B-EP2DL-GHxx | 384                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                        |              |     |              |     |
| B-EP4DL-GHxx | 832                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                        |              |     |              |     |

#### Explanation



- (1) The graphic data should be separated into units of 8 dots and sent in the above order (1 to 72).
- (2) The graphic data is 00H to FFH.
- (3) The minimum unit of a graphic width is 8 dots. Dots with no data are transmitted as data 0.

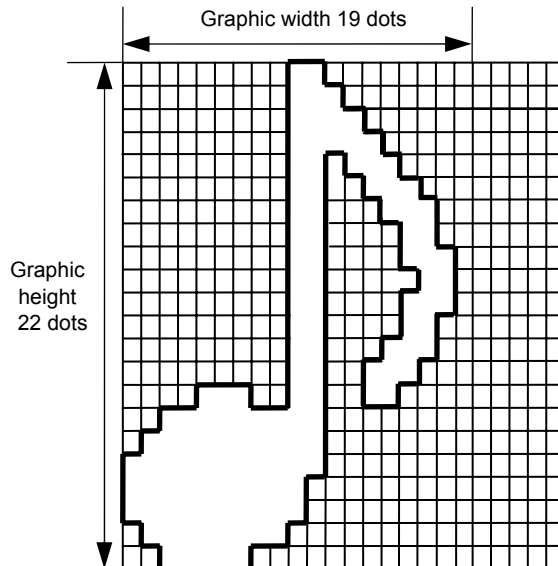


(4) The number of bytes of the graphic to be transmitted must be as follows;

The number of bytes of the graphic to be transmitted (Max. 64 KB)  
=  $\{(\text{No. of graphic width dots} + 7)/8\} \times \text{No. of graphic height dots}$

\* The value in the brackets is rounded down to the nearest whole number.

Example



```
[ESC] SG; 1, 0019, 0024,
[00H] [60H] [00H] [00H] [70H] [00H] [00H] [78H] [00H]
[00H] [7CH] [00H] [00H] [6EH] [00H] [00H] [67H] [00H]
[00H] [63H] [80H] [00H] [61H] [80H] [00H] [61H] [C0H]
[00H] [60H] [C0H] [00H] [61H] [C0H] [00H] [61H] [80H]
[00H] [63H] [80H] [00H] [67H] [C0H] [00H] [66H] [00H]
[0FH] [60H] [00H] [0EH] [60H] [00H] [3FH] [E0H] [00H]
[7FH] [FEH] [00H] [FFH] [E0H] [00H] [FFH] [C0H] [00H]
[FFH] [C0H] [00H] [EFH] [80H] [00H] [3EH] [00H] [00H]
[LF] [NUL]
```

6.9.2 GRAPHIC FIELD COMMAND

[ESC] N

**Function** Sets how the graphic data is to be printed on the label.

**Format** [ESC] N; a, bbbb, cccc [LF] [NUL]

**Term**

a: Graphic No. to be invoked and drawn  
1 to 2

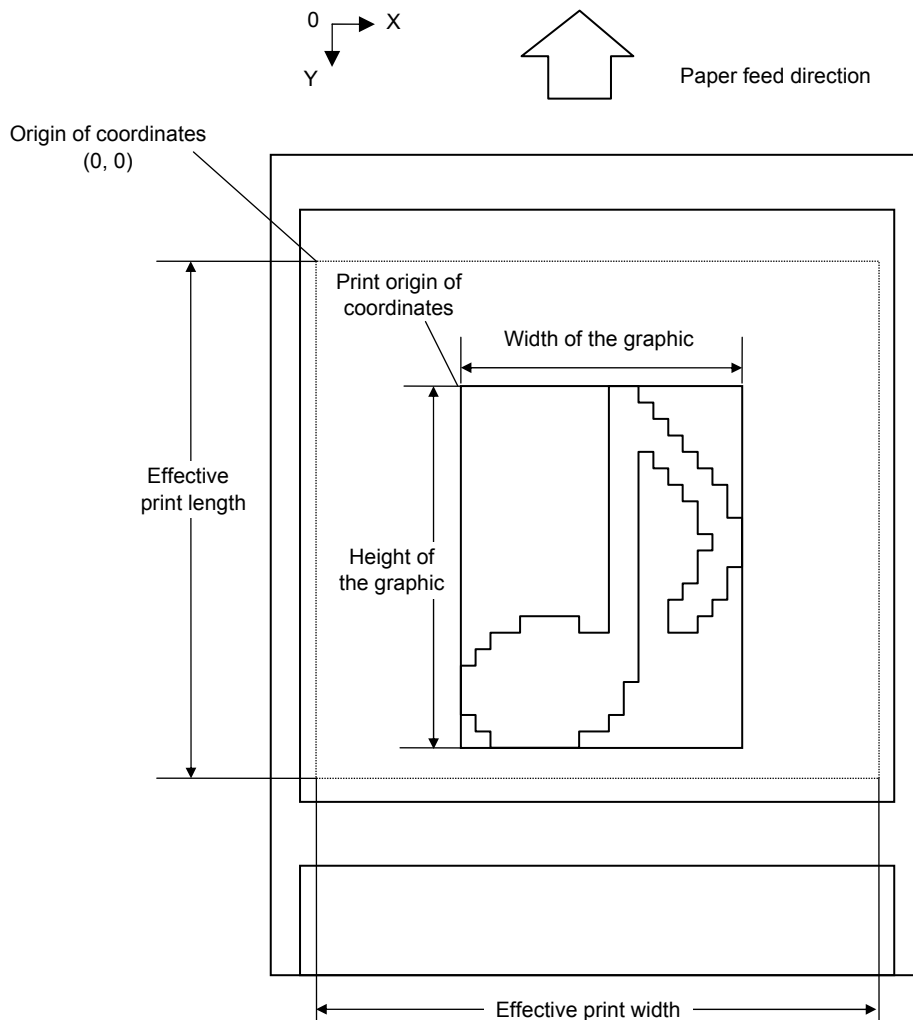
bbbb: Print origin of X-coordinate of graphic data  
Fixed at 4 digits (in 0.1 mm units)

cccc: Print origin of Y-coordinate of graphic data  
Fixed at 4 digits (in 0.1 mm units)

**Explanation**

(1) If the Graphic Field Command is stored in a form, like the Bit Map Font Field Command, the Outline Font Field Command, or the Barcode/Two-dimensional Code Format Command, the graphic data is automatically drawn, when the stored form is invoked by the Data Print Command.

(2) When no graphic data has been stored, the printer does not print any graphics even if a graphic data number is specified by the Graphic Field Command.



## 6.10 COMMANDS RELATED TO PC COMMAND SAVING

### 6.10.1 FORM STORE START COMMAND

[ESC] XO

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Declares the start of form storage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format   | [ESC] XO; aa, b [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Term     | <p>aa:     Form No.<br/>          01 to 20</p> <p>b:       Form version No.<br/>          0 to 9   (It is not stored when "0" is designated)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Notes    | <p>(1) Max. 20 types can be stored. However, since the memory capacity is limited, the maximum number may vary depending on the form size to be stored.</p> <p>(2) The data which is stored most recently is the newest in spite of the version No.</p> <p>(3) When the form number which has been stored is stored again, the new form can be stored if the Form Store Start Command ([ESC] XO) is sent. However, memory is used every time a form is stored again.</p> <p>(4) Until the Form Store Terminate Command ([ESC] XP) is received after the Form Store Start Command ([ESC] XO) is received, any command other than below is not stored and is ignored.</p> <ul style="list-style-type: none"> <li>• Label Size Set Command ([ESC] D)</li> <li>• Print Density Fine Adjust Command ([ESC] AY)</li> <li>• Position Fine Adjust Command ([ESC] AX)</li> <li>• Bit Map Font Field Command ([ESC] PC)</li> <li>• Outline Font Field Command ([ESC] PV)</li> <li>• Barcode/Two-dimensional Code Format Command ([ESC] XB)</li> <li>• Graphic Field Command ([ESC] N)</li> <li>• Line Format Command ([ESC] LC)</li> </ul> <p>(5) If the Form Store Start Command is not sent, the Label Size Set Command ([ESC] D), the Bit Map Font Field Command ([ESC] PC), the Outline Font Field Command ([ESC] PV), the Barcode/Two-dimensional Code Format Command ([ESC] XB), and the Graphic Field Command ([ESC] N) are ignored and discarded.<br/>After the Form Store Start Command is sent, the Label Size Set Command should be sent before each field command, the Print Density Fine Adjust Command, or the Position Fine Adjust Command is sent.</p> <p>(6) When there is no free space in the form storage area in flash ROM because of storing a form, this area is automatically initialized. However, the latest version of each form is held.</p> <p>(7) Since the drawing buffer is cleared after receiving this command, reprint by the reprint key is disabled.</p> |
| Refer to | Form Store Terminate Command ([ESC] XP)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Example  | <p>To start storing version 3 of form No. 2.</p> <p>[ESC] XO; 02, 3 [LF] [NUL]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

### 6.10.2 FORM STORE TERMINATE COMMAND

**[ESC] XP**

|          |                                                                                                                                   |
|----------|-----------------------------------------------------------------------------------------------------------------------------------|
| Function | Declares the termination of form storage.                                                                                         |
| Format   | [ESC] XP [LF] [NUL]                                                                                                               |
| Note     | (1) If the Form Store Start Command ([ESC] XO) is not previously received when this command is received, this command is ignored. |
| Refer to | Form Store Start Command ([ESC] XO)                                                                                               |

## 6.11 COMMANDS RELATED TO CHECK

### 6.11.1 MESSAGE DISPLAY COMMAND

[ESC] XJ

**Function** Displays the message on the LCD.

**Format** [ESC] XJ; aaa ----- aaa [LF] [NUL]

**Term** aaa ----- aaa: Display data (16 digits)

- Explanation**
- (1) When the printer receives the Message Display Command, first it processes the already received data (or completes the label issue if the data print command has been sent). Then, it displays the message on the LCD, and finally it enters a pause state.
  - (2) When the [PAUSE] key is pressed, the pause state is cleared and the LCD displays the normal message. After the pause state is cleared, the printer resumes processing the data received after the Message Display Command.

- Notes**
- (1) The number of characters to be displayed is 16. When the display data is less than 16 characters, the blanks are filled with spaces. When the display data exceeds 16 characters, the excess data will be discarded.
  - (2) During a pause state, a halt due to an error, or a head open state, the Message Display Command is not processed even if it is received. In this case, the command is processed after the above state is cleared.
  - (3) The following characters can be displayed on the LCD.

If any character other than the mentioned below is received, “?” is displayed or a command error occurs.

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

\* The shaded parts are Japanese. They are omitted here.

## 6.12 COMMANDS RELATED TO CONTROL

### 6.12.1 INITIALIZE COMMAND

[ESC] WR, [ESC] @

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Returns the printer to its initial state.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Format      | [ESC] WR [LF] [NUL]<br>[ESC] @                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Explanation | <ol style="list-style-type: none"> <li>(1) The printer is returned to the same state as when the power is turned on.</li> <li>(2) If the printer receives this command during printing, the printer prints the label which is being printed, then performs initialization.</li> <li>(3) After the Initialize Command is sent (or after printing is completed, if printing is performed), the next command must not be sent within approx. 30 seconds on the wireless LAN model or within 5 seconds on other models since the printer perform initialization. In IrDA: TEC Protocol, if ACK/status transmission is specified by the Issue Command, the printer returns an ACK, which indicates the command process end, to the EOT after the printer is initialized. In RS-232C, when the status response is specified, the printer returns the status (10H). After this status is received, the next command may be sent. In IrDA: IrCOMM, IrDA: IrOBEX, USB, Bluetooth, or Wireless LAN, the printer does not return the status.</li> <li>(4) To use IrDA interface for sending this command to the printer, only this command should be sent. After the command is sent, the link should be terminated. Even if the host does not terminate the link, the printer performs the termination process. Therefore, after initialization is completed, the host should establish the link again.</li> <li>(5) When receiving this command during data transmission, the printer is initialized after transmission is completed.</li> </ol> |
| Notes       | <ol style="list-style-type: none"> <li>(1) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the SYSTEM mode.</li> <li>(2) After the code of the Bit Map Writable Character Command ([ESC] XD) or the Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specifying the type of data.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

### 6.12.2 BATCH RESET COMMAND

**[ESC] Z0** <sup>(ZERO)</sup>

|             |                                                                               |
|-------------|-------------------------------------------------------------------------------|
| Function    | Resets the printer.                                                           |
| Format      | [ESC] Z0 [LF] [NUL]                                                           |
| Explanation | (1) This command will not be executed until the printer enters an idle state. |

## 6.13 COMMANDS RELATED TO STATUS

### 6.13.1 STATUS REQUEST COMMAND

[ESC] FM, [ESC] WS, [ESC] V

|             |                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------|
| Function    | Sends the printer status to the host computer.                                                        |
| Format      | [ESC] WS [LF] [NUL]<br>[ESC] FM [LF] [NUL]<br>[ESC] v                                                 |
| Explanation | (1) When receiving this command, the printer sends the printer status and battery status to the host. |

- For IrDA: TEC Protocol: Data to be sent (Fixed at 27 bytes)

| STX | Printer ID |     | Version No. of each form |     |       |     | Printer status | Battery status | CRC |     |
|-----|------------|-----|--------------------------|-----|-------|-----|----------------|----------------|-----|-----|
| 02H | xxH        | xxH | V01                      | V02 | ..... | V20 | xxH            | xxH            | xxH | xxH |

- For IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN:  
Data to be sent (Fixed at 5 bytes)

| STX | Printer ID |     | Printer status | Battery status |
|-----|------------|-----|----------------|----------------|
| 02H | xxH        | xxH | xxH            | xxH            |

Printer ID.....2-byte hex data (in order from High to Low)

Printer status.....Printer status is indicated in 1-byte data.

- 00H: Normal status (Idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Operating
- 0DH: Normal end + Label end (See **NOTE.**)
- 0EH: Flash ROM storage area full state
- 0FH: Wait for strip
- (10H: Normal issue end):  
Response status for automatic status transmission
- 14H: Pause state
- 19H: Ambient temperature error
- 32H: Abnormal battery temperature
- 33H: Battery excessive temperature
- 37H: Charging error
- 39H: Bluetooth setup error (including initialiation error)
- 45H: Wait for battery recovery
- 46H: Wait for print head temperature reduction
- 47H: Wait for motor temperature reduction
- 55H: Writable character/PC command save mode



Status in the compatible mode for B-SP series

- 00H: Normal state (idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature  
( including ambient temperature error, abnormal battery temperature and battery excessive temperature )
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Printer operating  
( including the following statuses: wait for strip, pause state, writable character/PC command save mode, wait for battery recovery and wait for print head/motor temperature reduction )
- 0DH: Normal end + Label end (See **NOTE**.)
- 0EH: Flash ROM storage area full state
- (10H: Normal issue end):  
Response status for automatic status transmission
- 37H: Charging error
- 39H: Bluetooth setup error (including initialization error)

**NOTE:** This is a state when the printer runs out of labels, after the effective print length is printed.

Battery status..... The battery charge status is indicated in 5 levels.

(B-EP2DL)

- 01H: 7.2 V or less (Print failure)
- 02H: 7.3 V to 7.4 V  
(Remaining No. of printable labels: Approx. 1 to 30)
- 03H: 7.5 V to 7.7 V  
(Remaining No. of printable labels: Approx. 30 to 150)
- 04H: 7.8 V to 7.9 V  
(Remaining No. of printable labels: Approx. 150 to 300)
- 05H: 8.0 V to 8.4 V  
(Remaining No. of printable labels: Approx. 300 min.)

(B-EP4DL)

01H: 14.0 V or less (Print failure)

02H: 14.1 V to 14.6 V

(Remaining No. of printable labels: Approx. 1 to 30)

03H: 14.7 V to 15.2 V

(Remaining No. of printable labels: Approx. 30 to 150)

04H: 15.3 V to 15.9 V

(Remaining No. of printable labels: Approx. 150 to 300)

05H: 16.0 V to 16.8 V

(Remaining No. of printable labels: Approx. 300 min.)

\* The remaining number of printable labels may vary according to the contents to be printed and the ambient environment.

CRC.....2-byte hex data (in order from Low to High)

### 6.13.2 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND [ESC] WB

**Function** Sends information on the printer status and the free space of the receive buffer to the host.

**Format** [ESC] WB [LF] [NUL]

- Explanation**
- (1) This command makes the printer send information on its status and free space of the receive buffer, regardless of the setting of the Status Response parameter.
  - (2) The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted.
  - (3) Free space of the receive buffer for the interface which sent this command, is returned to the host.

[IrDA: TEC Protocol] Data to be transmitted (fixed at 22 bytes)

| STX | Printer ID |     | Status | Remaining No. of labels |     |     |     | Length |     |
|-----|------------|-----|--------|-------------------------|-----|-----|-----|--------|-----|
| 02H | 3xH        | 3xH | 33H    | 3xH                     | 3xH | 3xH | 3xH | 32H    | 32H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CRC |     |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

Data to be transmitted (fixed at 23 bytes)

| SOH | STX | Printer status |     | Status type | Remaining No. of labels |     |     |     | Length |     |
|-----|-----|----------------|-----|-------------|-------------------------|-----|-----|-----|--------|-----|
| 01H | 02H | 3xH            | 3xH | 33H         | 3xH                     | 3xH | 3xH | 3xH | 32H    | 33H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CR  | LF  |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | 0DH | 0AH |

Printer status.....Printer status is indicated in 2-byte data.

- "00": Normal status
- "01": Cover open state
- "02": Operating
- "04": Pause state
- "05": Wait for strip
- "06": Command syntax error (including Ir packet error)
- "09": Normal issue end + Label end
- "11": Paper jam
- "13": Label end
- "15": Cover open error
- "17": Broken thermal print head dots
- "18": Thermal head excessive temperature
- "19": Ambient temperature error
- "32": Abnormal battery temperature
- "33": Battery excessive temperature
- "36": Low battery
- "37": Charging error
- "39": Bluetooth setup error (including initialization error)
- "45": Wait for battery recovery
- "46": Wait for print head temperature reduction
- "47": Wait for motor temperature reduction
- "50": Flash ROM write error
- "51": Flash ROM erase error
- "54": Flash ROM storage area full state
- "55": Writable character/PC command save mode

Remaining No. of labels ...Indicates the remaining number of labels in four bytes.  
"0000" to "9999"

Length:.....Indicates the number of bytes of the entire status data  
IrDA: TEC Protocol: Fixed at "22."  
IrDA: IrCOMM, IrDA: IrOBEX, USB,  
RS-232C, Bluetooth, Wireless LAN: Fixed at "23."

Receive buffer free space:....Indicates the free space of the receive buffer.

Entire receive buffer free space:.... Indicates the entire free space of the receive buffer.  
Fixed at "00512."

CRC/CR, LF:..... Indicates the end of the status block.

Notes

- (1) The status is returned only to the interface which sent this command.
- (2) The printer returns the same status, regardless of whether or not the compatible mode for the B-SP series is set.
- (3) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specified for the type of data.
- (4) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends a status.
- (5) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec., the printer may fail to receive it.

Example

[ESC] WB [LF] [NUL]

6.13.3 MODE INFORMATION ACQUIRE COMMAND

[ESC] WX

**Function** Sends the printer mode information to the host.

**Format** [ESC] WX [LF] [NUL]

**Explanation**

- (1) The status when the compatible mode for the B-SP series is on differs from the status when the compatible mode is off.
- (2) The mode information format to be sent to the host, is as follows:

- When the compatible mode for the B-SP series is off.

LABEL mode (Mode = 0)

Batch issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | L                           | A   | B   | E   | L   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 4CH                         | 41H | 42H | 45H | 4CH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | L                           | A   | B   | E   | L   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |
| 02H | 4CH                         | 41H | 42H | 45H | 4CH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

Strip issue mode

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | L                           | A   | B   | E   | L   | (   | S   | )   | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 4CH                         | 41H | 42H | 45H | 4CH | 28H | 53H | 29H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | L                           | A   | B   | E   | L   | (   | S   | )   | SP  | SP  | SP  | SP  | SP  | SP  | SP  |
| 02H | 4CH                         | 41H | 42H | 45H | 4CH | 28H | 53H | 29H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

The previous page shows examples where the message is received in LABEL mode when the compatible mode for the B-SP series is off. In addition, the following messages are returned.

|                                                        |                                                             |             |
|--------------------------------------------------------|-------------------------------------------------------------|-------------|
| TPCL mode                                              | TPCL                                                        |             |
| TPCL1 mode                                             | TPCL1                                                       |             |
| LABEL mode                                             | LABEL                                                       |             |
| RECEIPT mode                                           | RECEIPT                                                     |             |
| RECEIPT1 mode                                          | RECEIPT1                                                    |             |
| ESC/POS mode                                           | ESC/POS                                                     |             |
| Online reset menu                                      | USER■SYSTEM                                                 |             |
| SYSTEM mode for users<br>PAUSE + POWER keys            | USER■SYSTEM                                                 |             |
| SYSTEM mode for<br>administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER■SYSTEM |
|                                                        | When the password setting is on<br>and after it is entered  | SYSTEM      |
|                                                        | When the password setting is off                            | SYSTEM      |
| TPCL (strip issue mode)                                | TPCL■(S)                                                    |             |
| TPCL1 (strip issue mode)                               | TPCL1 (S)                                                   |             |
| LABEL (strip issue mode)                               | LABEL (S)                                                   |             |

\* ■ indicates a space.

- When the compatible mode for the B-SP series is on.

LABEL mode (Mode = 0)

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | L                           | A   | B   | E   | L   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 4CH                         | 41H | 42H | 45H | 4CH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | L                           | A   | B   | E   | L   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |
| 02H | 4CH                         | 41H | 42H | 45H | 4CH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

The above shows examples where the message is received in LABEL mode when the compatible mode for the B-SP series is off. In addition, the following messages are returned.

|                                                     |                                                             |               |
|-----------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                           | TPCL-LE                                                     |               |
| TPCL1 mode                                          | TPCL-LE1                                                    |               |
| LABEL mode                                          | LABEL                                                       |               |
| RECEIPT mode                                        | RECEIPT                                                     |               |
| RECEIPT1 mode                                       | RECEIPT1                                                    |               |
| ESC/POS mode                                        | ESC/POS                                                     |               |
| Online reset menu                                   | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys         | USER ■ SYSTEM                                               |               |
| SYSTEM mode for administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                     | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                     | When the password setting is off                            | SYSTEM        |

\* ■ indicates a space.



6.13.4 VERSION INFORMATION ACQUIRE COMMAND

[ESC] WV

**Function** Sends information such as the program version of the printer.

**Format** [ESC] WV [LF] [NUL]

**Explanation** (1) The format of the program version data to be returned to the host is as follows.

[IrDA: TEC Protocol]

|               |     |     |                                                                                                                      |
|---------------|-----|-----|----------------------------------------------------------------------------------------------------------------------|
| STX           |     | 02H |                                                                                                                      |
| Creation date | "0" | 30H | Creation date of the program:<br>9-byte data indicated in order of Day-<br>Month-Year                                |
|               | "4" | 34H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "R" | 52H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "8" | 38H |                                                                                                                      |
| Model         | "B" | 42H | Model:<br>7-byte ASCII code indicating the model<br>B-EP2DG (2-inch/203-dpi model)<br>B-EP4DG (4-inch/203-dpi model) |
|               | "_" | 2DH |                                                                                                                      |
|               | "E" | 45H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "D" | 44H |                                                                                                                      |
|               | "G" | 47H |                                                                                                                      |
| Version       | "V" | 56H | Program version:<br>5-byte data: Vx.xx<br>└── Revision<br>└── Version                                                |
|               | "1" | 31H |                                                                                                                      |
|               | "." | 2EH |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
| CRC           |     | xxH |                                                                                                                      |
| CRC           |     | xxH |                                                                                                                      |

[IrDA: IrCOMM, IrDA: IrOBEX, RS-232C, Bluetooth, Wireless LAN]

|               |     |     |                                                                                                                      |
|---------------|-----|-----|----------------------------------------------------------------------------------------------------------------------|
| SOH           |     | 01H |                                                                                                                      |
| STX           |     | 02H |                                                                                                                      |
| Creation date | "0" | 30H | Creation date of program:<br>9 bytes of data indicated in order of Day-<br>Month-Year                                |
|               | "4" | 34H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "R" | 52H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "8" | 38H |                                                                                                                      |
| Model         | "B" | 42H | Model:<br>7-byte ASCII code indicating the model<br>B-EP2DG (2-inch/203-dpi model)<br>B-EP4DG (4-inch/203-dpi model) |
|               | "_" | 2DH |                                                                                                                      |
|               | "E" | 45H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "D" | 44H |                                                                                                                      |
|               | "G" | 47H |                                                                                                                      |
| Version       | "V" | 56H | Program version:<br>5 bytes of data: Vx.xx<br>└── Revision<br>└── Version                                            |
|               | "1" | 31H |                                                                                                                      |
|               | "." | 2EH |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
| ETX           |     | 03H |                                                                                                                      |
| EOT           |     | 04H |                                                                                                                      |
| CR            |     | 0DH |                                                                                                                      |
| LF            |     | 0AH |                                                                                                                      |

**Notes** (1) No statuses are returned when using USB.

**Example** [ESC] WV [LF] [NUL]

**6.13.5 PRINTER SERIAL NUMBER ACQUIRE COMMAND [ESC] WY**

**Function** Sends the printer serial number to the host.

**Format** [ESC] WY [LF] [NUL]

**Explanation**

- (1) The format of the printer serial No. to be returned to the host is as follows.

[IrDA: TEC Protocol]

|     |                    |     |     |
|-----|--------------------|-----|-----|
| STX | Printer serial No. | CRC | CRC |
| 02H | 32 bytes           | XXH | XXH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |                    |
|-----|--------------------|
| SOH | Printer serial No. |
| 02H | 32 bytes           |

When the printer serial No. is "2308M000001":

[32H][33H][30H][38H][4DH][30H][30H][30H][30H][30H][31H][00H][00H][00H][00H][00H]  
 2 3 0 8 M 0 0 0 0 0 0 1  
 [00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H]

\* The remaining bytes of 32 bytes are filled with 00H.

**Example** [ESC] WY [LF] [NUL]

## 6.14 COMMANDS RELATED TO BLUETOOTH AND WIRELESS LAN

### 6.14.1 DEVICE ADDRESS ACQUIRE COMMAND

[ESC] IT

|             |                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Reads the device address of the Bluetooth interface or MAC address of the wireless LAN interface.                                                                                                |
| Format      | [ESC] IT [LF] [NUL]                                                                                                                                                                              |
| Explanation | (1) This command reads the device address of the Bluetooth or MAC address of the Wireless LAN. When using the IrDA, the following information field is placed in the information frame and sent. |

[Information field to be sent when IrDA: TEC Protocol is used]

|     |                                                      |     |     |
|-----|------------------------------------------------------|-----|-----|
| STX | Bluetooth device address or Wireless LAN MAC address | CRC |     |
| 02H | 12 bytes                                             | xxH | xxH |

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, RS-232C, USB, Bluetooth, Wireless LAN is used]

|     |                                                      |
|-----|------------------------------------------------------|
| STX | Bluetooth device address or Wireless LAN MAC address |
| 02H | 12 bytes                                             |

The printer sends the following information:

Bluetooth device address: 0015b5aa0005  
Wireless LAN MAC address: 000940387630

Bluetooth device address

[30H] [30H] [31H] [35H] [62H] [35H] [61H] [61H] [30H] [30H] [30H] [35H]  
0 0 1 5 b 5 a a 0 0 0 5

Wireless LAN MAC address

[30H] [30H] [30H] [39H] [34H] [30H] [33H] [38H] [37H] [36H] [33H] [30H]  
0 0 0 9 4 0 3 8 7 6 3 0

### 6.14.2 BLUETOOTH RELATED PARAMETER ACQUIRE COMMAND [ESC] WT

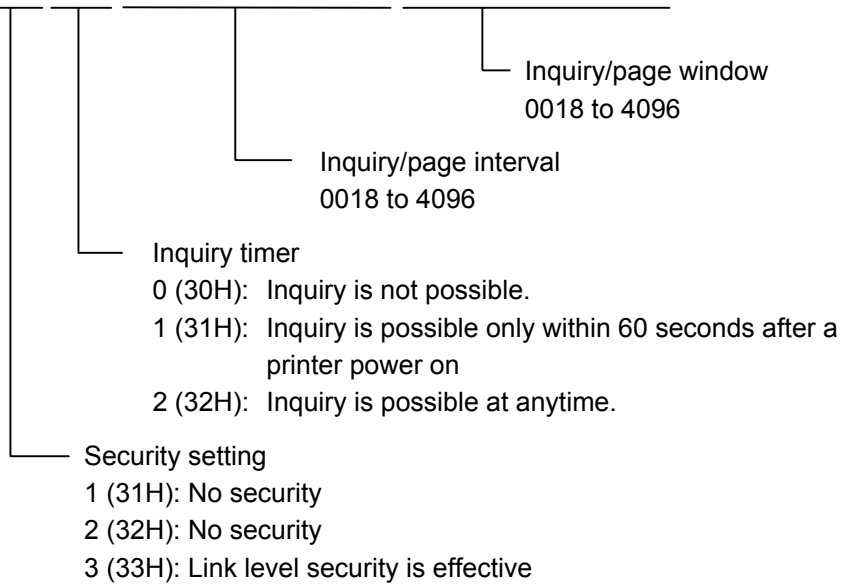
**Function** Acquires the parameter settings related to the Bluetooth.

**Format** [ESC] WT [LF] [NUL]

**Explanation** (1) This command reads the parameters related to the Bluetooth. When using the IrDA, the following information field is placed in the information frame and sent to the host.

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |



| Bluetooth device name | CRC |     |
|-----------------------|-----|-----|
| 32 bytes              | xxH | xxH |

Bluetooth device name: Fixed at 32 bytes.

When the Bluetooth device name is "TOSHIBA TEC BT."

[54H] [4FH] [53H] [48H] [49H] [42H] [41H] [20H] [54H] [45H] [43H] [20H] [42H] [54H] [00H] [00H]  
T O S H I B A ' T E C ' B T  
[00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H]

\* When the Bluetooth device name is less than 32 bytes, the remaining bytes are filled with 00H.

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth or Wireless LAN is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |

| Bluetooth device name |
|-----------------------|
| 32 bytes              |

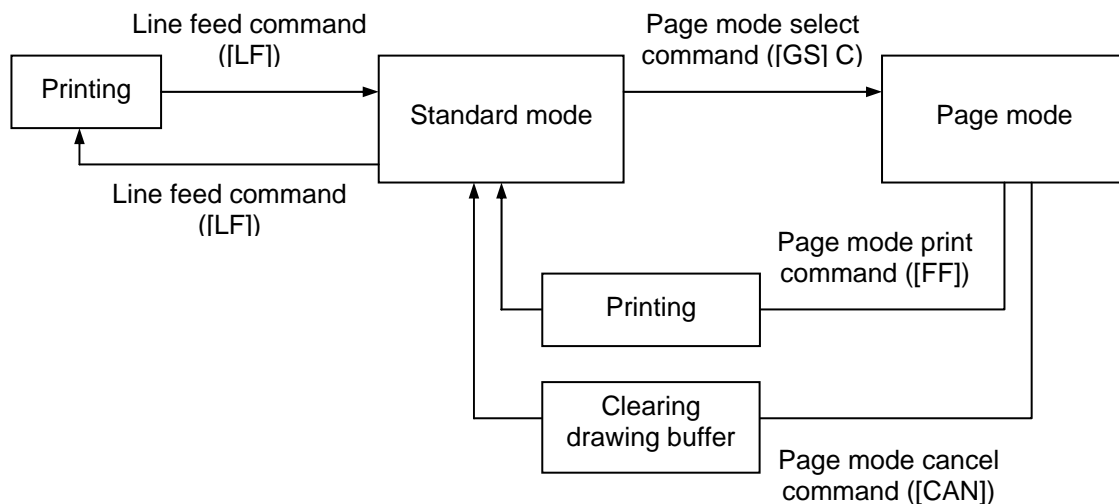
## 7. RECEIPT MODE (INTERFACE COMMANDS)

### 7.1 GENERAL DESCRIPTION

This chapter describes details regarding the interface commands for the RECEIPT and RECEIPT1 modes of the print mode. If operations are the same between the RECEIPT mode and the RECEIPT1 mode, only "RECEIPT mode" is described in explanations, and the RECEIPT1 mode is included. If operations are different between them, the RECEIPT mode (Mode = 1 or 3) or the RECEIPT1 mode (Mode = 2) is specified. In the RECEIPT mode, only batch issues are supported.

This printer has 2 modes: standard mode and page mode.

In standard mode, the printer performs a print job or feeds paper every time the line feed command ([LF]) is received. In page mode, however, all received line feed commands ([LF]) are just expanded in the print area on the memory and the printer does not operate. Once the Page Mode Print Command ([FF]) is executed, the printer prints all data expanded in the print area in a collective manner.



Either of the language types, Kanji, Chinese and Korean, can be implemented. Any font other than the on-board fonts is selectable.

## 7.2 OUTLINE OF COMMANDS

### 7.2.1 FORMAT OF INTERFACE COMMAND

|     |         |
|-----|---------|
| ESC | Command |
|-----|---------|

|    |         |
|----|---------|
| GS | Command |
|----|---------|

|     |         |    |     |
|-----|---------|----|-----|
| ESC | Command | LF | NUL |
|-----|---------|----|-----|

|    |
|----|
| FF |
|----|

|     |
|-----|
| CAN |
|-----|

The control codes are as follows:

- ESC (1BH)
- LF (0AH)
- NUL (00H)
- GS (1DH)
- FF (0CH)
- CAN (18H)

### 7.2.2 HOW TO USE REFERENCE

|          |
|----------|
| Function |
|----------|

Describes the outline of the function of the command.

|        |
|--------|
| Format |
|--------|

Shows the format of the command

The format designation method should conform to the following rules:

- “n” indicates a parameter item.
- Brackets and parentheses are used only in coding, and must not be transmitted in practice.
- Other symbols must always be inserted at the designated positions before being transmitted.

|      |
|------|
| Term |
|------|

Explains the term(s) used in the format.

|               |
|---------------|
| Initial value |
|---------------|

Indicates the initial value of the parameter (when turning the power on, or changing the print mode to the RECEIPT mode.)

|             |
|-------------|
| Explanation |
|-------------|

Explains the command in detail.

|          |
|----------|
| Refer to |
|----------|

Related commands

### 7.2.3 PRECAUTIONS

- (1) The host should send the print data and the Print Line Feed Command for printing. Commands other than these should be sent as required.

- (2) Character type

Only standard characters are used when printing the data.

[Ex] 1 2 3 4 5 A B C D E

|       |       |       |       |       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| [31H] | [32H] | [33H] | [34H] | [35H] | [41H] | [42H] | [43H] | [44H] | [45H] |
| 1     | 2     | 3     | 4     | 5     | A     | B     | C     | D     | E     |

- (3) While the RECEIPT mode is selected, writable character data cannot be stored. To store writable character data, change the print mode from the RECEIPT mode to the LABEL or the TPCL mode.

- (4) [FEED] key

In the RECEIPT mode, if the [FEED] key is pressed, the receipt is not printed again. A 20-mm feed is performed. To cut a receipt using the tear bar after issuing it, a receipt can be fed to the position at which the receipt can be easily cut by pressing the [FEED] key.

- (5) Error processing

[RECEIPT mode]

When an error occurs while the printer is issuing a receipt, the LED blinks. The printer discards all data and commands which have been received, and enters a wait state for a command. Therefore, if an error occurs, the print data or a command should be sent again after clearing the error.

[RECEIPT1 mode]

After the label end error or the cover open error is cleared, the printer automatically continues printing the data which has been received before the error occurred.

- (6) Status response

In the RECEIPT mode, the printer does not automatically send a status indicating the normal end. Therefore, the host should send the Status Request Command to check the printer status. However, when the Mode Select Command or the Graphic Command is sent, or if an error occurs, the printer sends the status. In IrDA: IrCOMM communications, only when the status transmission is specified, the printer sends the status.

- (7) Initial values (Default setting values of parameters designated by commands.)

When the power is turned on or when RECEIPT mode or RECEIPT1 mode is selected, the initial values will be set. The initial values are also set when the mode is switched between RECEIPT mode and RECEIPT1 mode, or when the mode is switched from RECEIPT mode to RECEIPT mode, or from RECEIPT1 mode to RECEIPT1 mode.



## 7.3 COMMANDS RELATED TO SETTING

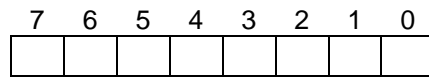
### 7.3.1 MODE SELECT COMMAND

[ESC] M

**Function** Changes the print mode.

**Format** [ESC] M; a,(b) [LF] [NUL]

**Term** a: Print mode designation



Print mode (Bit 0 to Bit 6 \* See Table 1.)

Automatic status response in IrDA: IrCOMM or USB

0: Not performed

1: Performed

\* Table 1 Print mode

| HEX | Mode     | How to deal with the received data after an error is cleared |
|-----|----------|--------------------------------------------------------------|
| 30H | LABEL    | Discards                                                     |
| 31H | RECEIPT  | Discards                                                     |
| 32H | RECEIPT1 | Continues printing                                           |
| 34H | ESC/POS  | Continues printing                                           |
| 41H | TPCL     | Continues printing                                           |
| 42H | TPCL1    | Continues printing                                           |

b: Print position detection feed (Omissible. If omitted, the print position detection feed is not performed.)

0: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is not performed after the mode is changed.

1: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is performed after the mode is changed.

**Explanation** (1) There are 4 types of the print mode: "LABEL", "RECEIPT," "TPCL" and "ESC/POS."

(2) "Automatic status response in IrDA: IrCOMM or USB" is the function for the specifications which do not allow the printer to spontaneously send the status through IrDA; IrCOMM or USB. This function enables the printer to forcefully send the status to the host, if the link between the printer and the host is established. However, if the link between the printer and the host is not established upon the status transmission, the printer cannot send the status. Therefore, the status is discarded. (In the next connection to the host, the printer does not send the status to the host.)

- (3) The sensor is not used in the RECEIPT, RECEIPT1 or ESC/POS mode. When sensor detectable paper is used for receipts and labels, print position detection feed cannot be done in the LABEL, TPCL or TPCL1 mode. By setting the print position detection feed parameter to 1, print position detection feed is carried out after the mode is changed to LABEL, TPCL or TPCL1.
- (4) In the TPCL1 mode, it is possible to re-print the last print data by pressing the FEED button.

Notes

- (1) The print mode designation (the specified print mode and the automatic status response in IrDA: IrCOMM or USB) is backed up in memory (even if the power is turned off).
- (2) The factory default is “TPCL mode” and “Automatic status response in IrDA: IrCOMM or USB is not performed.” (The IrDA protocol is “IrCOMM.”)
- (3) When the print mode is changed, the type of sensor is automatically changed.
  - LABEL mode (0):           The previously backed up sensor is designated.
  - TPCL mode (A):           The previously backed up sensor is designated.
  - TPCL1 mode (B):          The previously backed up sensor is designated.
  - RECEIPT mode (1):        No sensor is designated.
  - RECEIPT1 mode (2):      No sensor is designated.
  - ESC/POS mode (4):        No sensor is designated.
- (4) If the RECEIPT mode is selected or no sensor is designated in the LABEL or TPCL mode, an initial feed is not performed when the cover is closed (when the print position detection feed after the cover is closed is enabled with key operations or using the set command ([ESC] ZM03)).
- (5) When the mode change is finished, the printer sends the normal end status or an ACK to the host. However, when the mode is changed to the TPCL mode, the printer does not send the status. In IrDA: IrCOMM or USB, only when bit 7 of the print mode designation is set to “1”, the printer sends the status.
- (6) The print mode can be changed by the printer itself. However, since the setting for the automatic status response in IrDA: IrCOMM or USB cannot be changed, the setting remains as the same.
- (7) As the print position detection feed parameter is effective only when changing the print mode to LABEL or TPCL, this parameter status will be ignored when changing the mode to RECEIPT, RECEIPT1 or ESC/POS.
- (8) The print position detection feed is performed according to the conditions, such as, label pitch, fine adjustment, and sensor selection, which were set in the LABEL or TPCL mode before the printer is operated in RECEIPT, RECEIPT1 or ESC/POS mode. If no sensor is selected, the print position detection feed will not be performed.
- (9) After performing a print position detection feed, the printer does not send a process end status. If an error occurs during the print position detection feed, the feed is performed after the error is cleared by pressing the PAUSE key (when the print position detection feed after the cover is closed is enabled with key operations or using the set command ([ESC] ZM03)).

- (10) When changing the print mode by the printer itself, the print position detection feed parameter cannot be set.
- (11) When the mode select command is designated with the print position detection feed at the end of a print data issued in RECEIPT1 or ESC/POS mode, and if an error occurs while printing, the printing will restart after the error is cleared and then, the print mode will be changed to the LABEL or TPCL mode and a print position detection feed is performed. When the print position detection feed setting is omitted, the mode is not changed to LABEL or TPCL (the mode select command is discarded).
- (12) When the LABEL or TPCL mode is selected in the mode select command and the print position detection feed parameter is set 0 (not performed), and if an error occurs while the printer issues in RECEIPT1 or ESC/POS mode, the print mode is changed to the LABEL or TPCL mode after the error is cleared. (The mode select command is executed.)

### 7.3.2 PRINTER ID SET COMMAND

[ESC] ID

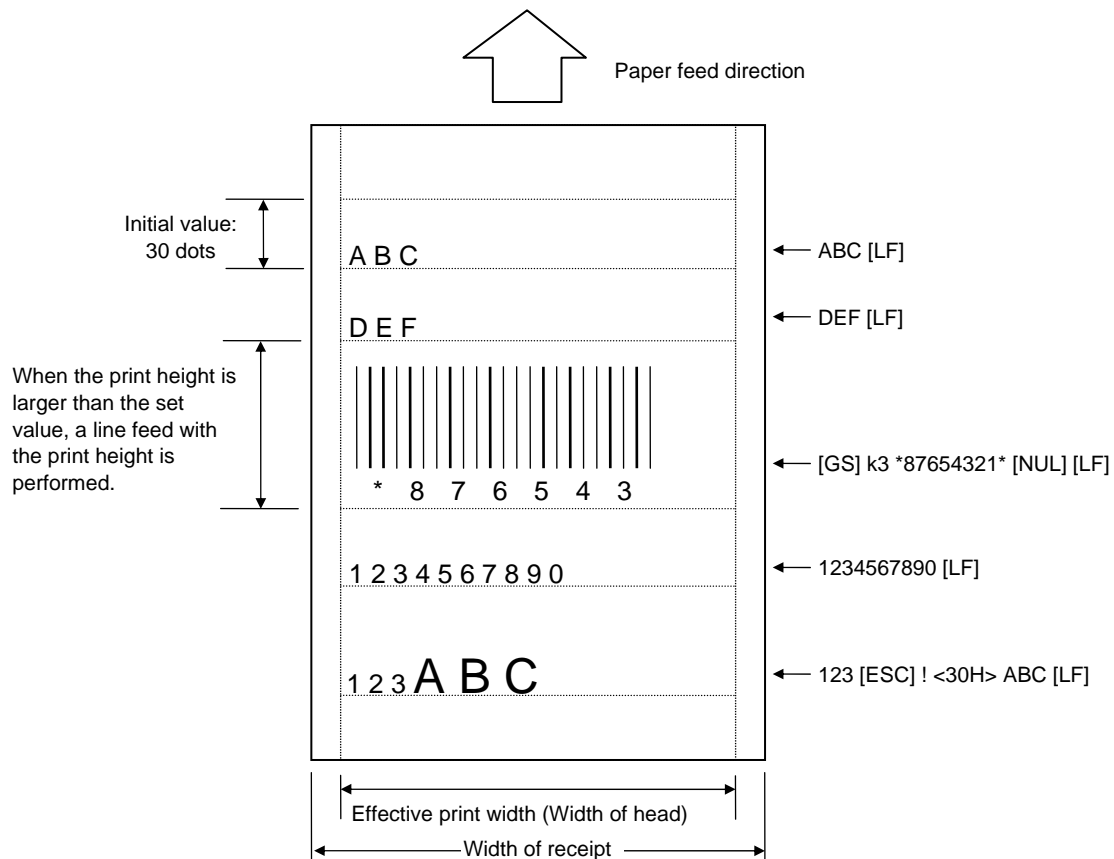
|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets the ID for the printer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Format      | [ESC] ID; aa [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Term        | aa: Printer ID (2-byte hex data)<br>0000H to FFFFH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Explanation | (1) The printer ID is the information required to identify each printer when communicating according to the IrDA: TEC Protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Notes       | (1) The set printer ID is backed up in memory (even if the Initialize command ([ESC] WR, [ESC] @) is executed or the power is turned off).<br>(2) The last 5 digits of the printer's serial number have been set as the printer ID, at the time of shipment from the factory.<br>(3) In IrDA: TEC Protocol, the printer checks the set ID against the ID in the received command packet. If they do not match, the printer discards the command packet. However, when the ID in the command packet is "0", the printer accepts the command packet without checking the set IDs. |
| Example     | To set "03H 51H" as the ID of the printer:<br>[ESC] ID; [03H] [51H] [LF] [NUL]<br>In this case, the printer ID in status printing is "00849."                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 7.4 COMMANDS RELATED TO FINE ADJUSTMENT

### 7.4.1 LINE FEED LENGTH SET COMMAND

[ESC] 3

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets the length of the line feed (the number of dots) which is performed by the Print Line Feed Command ([LF]).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format        | [ESC] 3n                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Term          | n: Length of line feed (1 byte)<br>00H to FFH (0 to 255 dots)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Initial value | n: 1EH (30 dots)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Explanation   | (1) When the power is turned on or the printer enters the RECEIPT mode, the initial value is 30 dots<br><br>(2) When the specified length of the line feed is larger than the character on the next line or the height of the barcode plus 6 dots, a line feed with the specified length is performed.<br><br>(3) When the specified length of the line feed is smaller than the character on the next line or the height of the barcode plus 6 dots, the specified length of the line feed is ignored, and a line feed with the height of the character or the barcode to be printed is performed. |

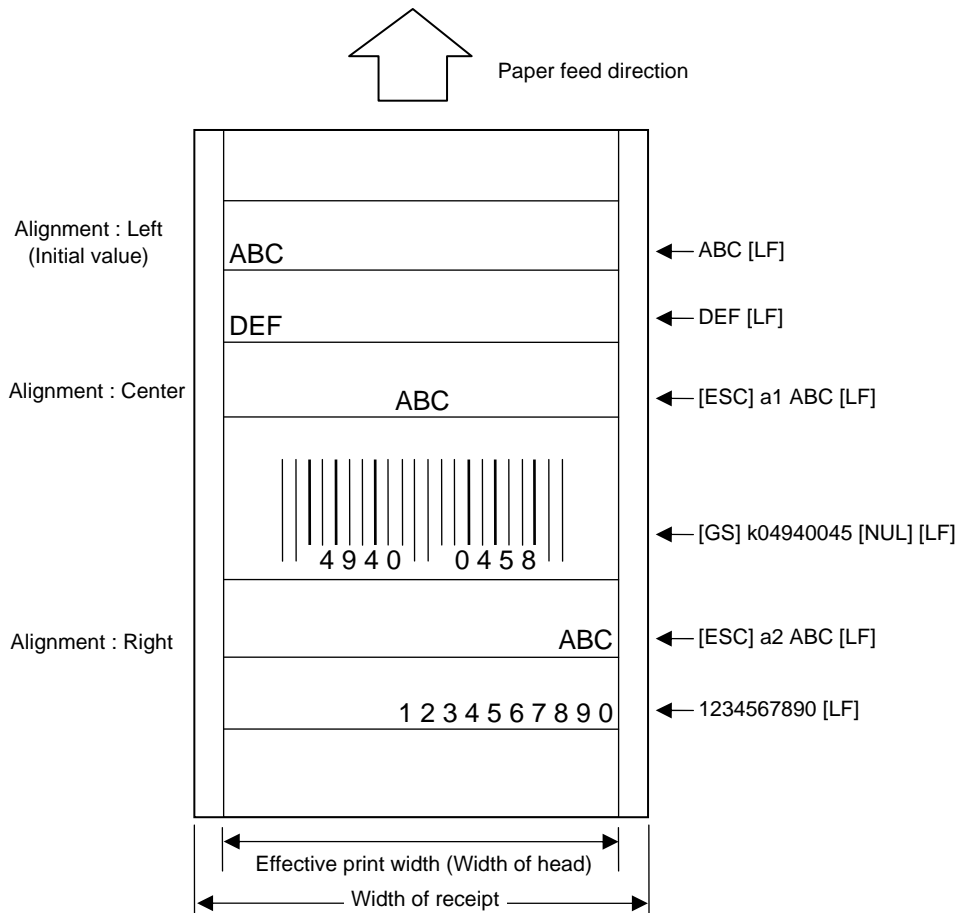


Refer to Print Line Feed Command ([LF])

**7.4.2 PRINT POSITION ALIGN COMMAND**

**[ESC] a**

|               |                                                                                                                                                                                                                                                                             |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Aligns the print position on the left, the right, or at the center.                                                                                                                                                                                                         |
| Format        | [ESC] an                                                                                                                                                                                                                                                                    |
| Term          | n: Alignment<br>0: Left<br>1: Center<br>2: Right                                                                                                                                                                                                                            |
| Initial value | n: 0 (Left)                                                                                                                                                                                                                                                                 |
| Explanation   | (1) When “n” is set to any value other than the above, a command error occurs.<br>(2) This command is effective for all lines which are printed after the command is received.<br>(3) For CODE128, EAN128 and UCC/EAN128, the print position should be aligned on the left. |



### 7.4.3 PRINT DENSITY FINE ADJUST COMMAND

[ESC] AY

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Adjusts the automatically set print density.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Format   | [ESC] AY; abb, c (, d) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Term     | <p>a: Indicates whether to increase or decrease the density<br/>           +: Increase (Darker)<br/>           -: Decrease (Lighter)</p> <p>bb: Fine adjustment value for print density<br/>           00 to 30 (in units of 1 step)</p> <p>c: Print mode<br/>           0: Reserved<br/>           1: Direct thermal</p> <p>d: Head output division designation<br/>           (Omissible. When omitted, settings backed up by the memory are valid.)</p> <p>2-inch print head width<br/>           0: Auto (Divided by 2 or 3)<br/>           1: Reserved (When designated, automatic selection of bipartite/tripartite division is performed.)<br/>           2: Divided by 3 (Fixed)<br/>           3: Auto1 (Not divided/Divided by 2 or 3)/Print quality oriented<br/>           4: Reserved (When designated, tripartite division is performed.)<br/>           5: Auto2 (Not divided/Divided by 2 or 3)/Print speed oriented (supported in V1.0E or later)</p> <p>4-inch print head width<br/>           0: Auto (Divided by 2, 3 or 6)<br/>           1: Reserved (When designated, automatic selection of bipartite/tripartite/6-partite division is performed.)<br/>           2: Reserved (When designated, automatic selection of bipartite/tripartite/6-partite division is performed.)<br/>           3: Auto1 (Not divided/Divided by 2, 3 or 6)<br/>           4: Divided by 6 (Fixed)</p> |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | <p>(1) The standard density is finely adjusted to increase or decrease.</p> <p>(2) When any fine adjustment value for print density out of the above range is set, a command error occurs.</p> <p>(3) When designating any value other than "1: Direct thermal" the print mode is corrected to 1.</p> <p>(4) The default value of the head output division designation is "3: Auto1 (Not divided/Divided by 2 or 3)" on the 2-inch print head and "3: Auto1 (Not divided/Divided by 2, 3 or 6)" on the 4-inch print head.</p> <p>(5) When "0: Auto" is designated on the 2-inch print head, "Divided by 2" or "Divided by 3" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching between "Divided by 2" and "Divided by 3". Therefore, do not designate "0: Auto" when a serial barcode is printed.</p> |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- (6) When “3: Auto1” or “5: Auto2” is designated for the 2-inch print head, “Not divided,” “Divided by 3” or “Divided by 2” is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among “Not divided,” “Divided by 2” and “Divided by 3.” Therefore, do not designate “3: Auto1” or “5: Auto2” when a serial barcode is printed.

The difference between Auto1 and Auto2 is while Auto1 is print quality oriented, Auto2 is print speed oriented. Auto2 is designated to increase the print speed although the print is slightly faded.

- (7) When “0: Auto” is designated on the 4-inch print head, “Divided by 2,” “Divided by 3” or “Divided by 6” is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among “Divided by 2,” “Divided by 3” and “Divided by 6.” Therefore, do not designate “0: Auto” when a serial barcode is printed.
- (8) When “3: Auto1” is designated on the 4-inch print head, “Not divided,” “Divided by 2,” “Divided by 3” or “Divided by 6” is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among “Not divided,” “Divided by 2,” “Divided by 3” and “Divided by 6.” Therefore, do not designate “3: Auto1” when a serial barcode is printed.

Notes

- (1) The set fine adjustment value for print density and the head output division designation are backed up in memory (retained even if the power is turned off).
- (2) The fine adjustment value changed by the Print Density Fine Adjust Command in the RECEIPT mode, is also effective for the TPCL, LABEL and ESC/POS modes.
- (3) When the head output division designation is omitted, the backed up value in memory is used.
- (4) When print density fine adjustment is selected in the SYSTEM mode (through key operations on the printer), the fine adjustment value is a sum of the value in the fine adjustment command and the system mode fine adjustment value. Note that the maximum fine adjustment value is  $\pm 30.0$  mm

Examples

To set the density to - 2:

[ESC] AY; -02, 1 [LF] [NUL]

To set the density to + 3:

[ESC] AY; +03, 1 [LF] [NUL]



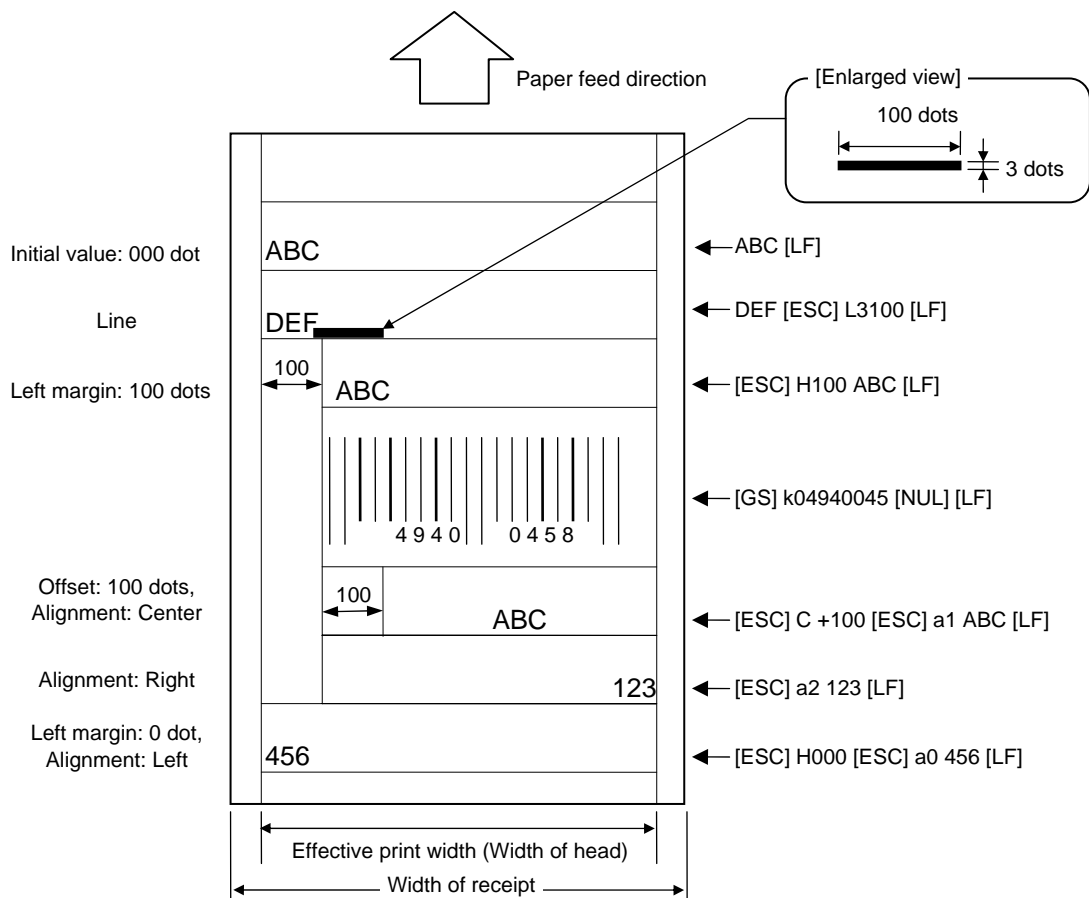
## 7.5 COMMANDS RELATED TO DRAWING FORMAT

### 7.5.1 LINE FORMAT COMMAND

[ESC] L

|          |                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Specifies the line format and draws it.                                                                                                                                                                                                                                                                                                                                                      |
| Format   | [ESC] Labbb<br>[ESC] Lcddeeee                                                                                                                                                                                                                                                                                                                                                                |
| Term     | <p>a: Line width<br/>1 to 9 (in units of dots)</p> <p>bbb: Line length<br/>001 to 999 (in units of dots)</p> <p>c: Expansion parameter<br/>e (Command parameter expansion designated)</p> <p>dd: No. of line width dots<br/>01 to 99 (in units of dots)<br/>Note that any value of 9 or more is corrected to 9.</p> <p>eeee: No. of line length dots<br/>0001 to 1296 (in units of dots)</p> |

**Explanation** (1) The print position of the line is shown below:



Note

- (1) If the print ratio of one line (the print head width) is higher than defined, printing may become poor, or the printer may be reset. When a horizontal line is to be drawn, note the print ratio.
- (2) When any line length exceeding the effective print width, the length is corrected to the maximum head width that varies depending on model.

|                 | B-EP2DL-GHxx | B-EP4DL-GHxx |
|-----------------|--------------|--------------|
| Max. head width | 48.0 mm      | 104.0 mm     |

## 7.5.2 FONT TYPE COMMAND

[ESC] K

|               |                                       |                                                                            |                    |
|---------------|---------------------------------------|----------------------------------------------------------------------------|--------------------|
| Function      | Specifies the font used for printing. |                                                                            |                    |
| Format        | [ESC] Kn                              |                                                                            |                    |
| Initial value | n:                                    | A: Standard character                                                      |                    |
| Term          | n:                                    | Font type                                                                  |                    |
|               |                                       | A: Standard Character                                                      | (12 × 24 dots)     |
|               |                                       | B: Bold Character                                                          | (48 × 96 dots)     |
|               |                                       | C: Writable Character                                                      | (24 × 24 dots)     |
|               |                                       | D: Price Font 1                                                            | (16 × 40 dots)     |
|               |                                       | E: Price Font 2                                                            | (32 × 48 dots)     |
|               |                                       |                                                                            | 203-dpi print head |
|               |                                       | F: Times Roman (Bold)                                                      | 21 points          |
|               |                                       | G: Helvetica (Bold)                                                        | 18 points          |
|               |                                       | H: Letter Gothic (Medium)                                                  | 14.3 points        |
|               |                                       | I: Courier (Medium)                                                        | 15 points          |
|               |                                       | J: Presentation (Bold)                                                     | 27 points          |
|               |                                       | O: GOTHIC725 Black                                                         | 6 points           |
|               |                                       | Q: Chinese/Writable Character                                              | (24 × 24 dots)     |
|               |                                       | R: Korean/Writable Character                                               | (24 × 24 dots)     |
|               | S: (Reserved)                         |                                                                            |                    |
|               | T: (Reserved)                         |                                                                            |                    |
|               | U: (Reserved)                         |                                                                            |                    |
| Explanation   | (1)                                   | When “n” is set to any value other than the above, a command error occurs. |                    |

### 7.5.3 OUTLINE FONT FORMAT COMMAND

[ESC] KV

|               |                                                                                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets the outline font.                                                                                                                                                                                                                       |
| Format        | [ESC] KVabbbccc                                                                                                                                                                                                                              |
| Initial value | None                                                                                                                                                                                                                                         |
| Term          | a: Font type<br>A: TEC Font 1 (Helvetica [Bold])<br>B: TEC Font 1 (Helvetica [Bold], Proportional)<br>K: Reserved<br><br>bbb: Character width<br>016 to 240 (in units of dots)<br><br>ccc: Character height<br>016 to 240 (in units of dots) |
| Explanation   | (1) When "a," "bbb," and "ccc" are set to any value other than the above, a command error occurs.                                                                                                                                            |

## 7.5.4 BARCODE/TWO-DIMENSIONAL CODE PRINT COMMAND [GS] k

**Function** Prints the specified barcode/two-dimensional code.

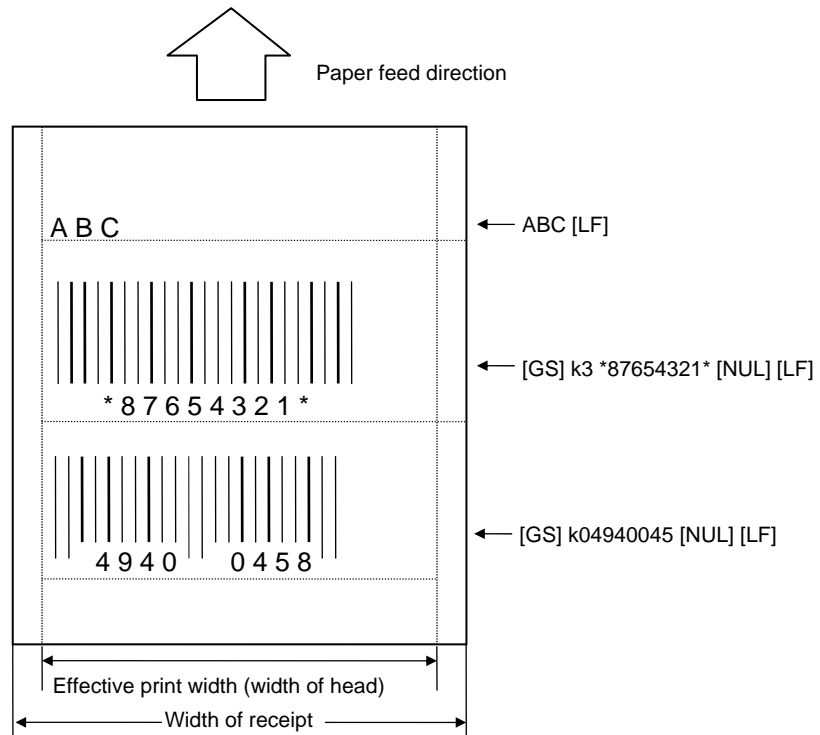
**Format** [GS] kn <bar data> [NUL]

**Term** n: Type of barcode/two-dimensional code

- 0: JAN8/EAN8
- 1: MSI
- 2: Interleaved 2 of 5 (ITF)
- 3: CODE39 (Standard)
- 4: NW7
- 5: JAN13/EAN13
- 6: UPC-E
- 7: EAN13 + 2 digits
- 8: EAN13 + 5 digits
- 9: CODE128 (with auto code selection)
- A: CODE128 (with auto code selection)
- B: CODE39 (Full ASCII)
- C: CODE93
- G: UPC-E + 2 digits
- H: UPC-E + 5 digits
- I: EAN8 + 2 digits
- J: EAN8 + 5 digits
- K: UPC-A
- L: UPC-A + 2 digits
- M: UPC-A + 5 digits
- N: EAN128
- n: UCC/EAN128
- P: PDF417 (Two-dimensional code)
- T: QR code (Two-dimensional code)

<bar data>: Barcode/two-dimensional code data

- Explanation**
- (1) When “n” is set to any value other than the above, a command error occurs.
  - (2) When the type of barcode is JAN8, EAN8, EAN8 + 2 digits, EAN8 + 5 digits, JAN13, EAN13, EAN13 + 2 digits, EAN13 + 5 digits, EAN128, UCC/EAN128, CODE128, UPC-E, UPC-E + 2 digits, UPC-E + 5 digits, UPC-A, UPC-A + 2digits or UPC-A + 5 digits, a check digit is automatically attached.
  - (3) When the type of barcode is CODE39, NW7, Interleaved 2 of 5 or MSI, a check digit is not attached. When a NW7 is used, the start/stop codes are not attached. Therefore, the host should attach them to the data.
  - (4) For CODE128, EAN128 and UCC/EAN128, only barcodes aligned on the left can be printed.
  - (5) For QR code, the mode, the mask number, and the connection settings are as follows: Automatic mode, automatically-set mask number, no connection.



Refer to

- Barcode Horizontal Size Command ([GS] w)
- Barcode Height Command ([GS] h)
- Numerals Under Bars Command ([GS] H)
- Security Level Command ([GS] s)
- No. of Columns (Strings) Command ([GS] c)
- Error Correction Level Set Command (for QR code) ([GS] q)
- QR Code Model Set Command ([GS] r)

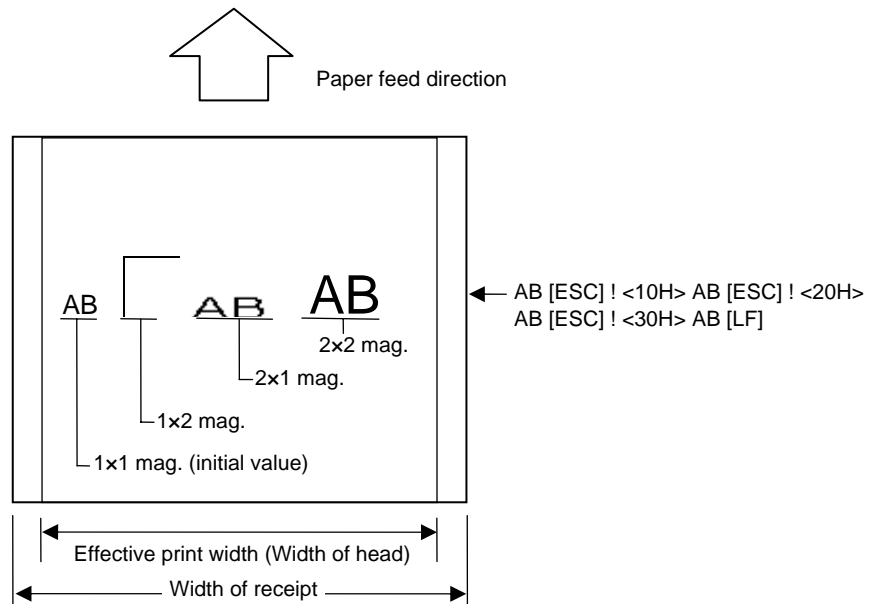
### 7.5.5 CHARACTER MAGNIFICATION COMMAND

[ESC] !

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Designates the magnification of the character to be printed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Format   | [ESC] !n                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Term     | <p>n: Character magnification (1 byte)</p> <p>00H: 1 magnification (horizontal) × 1 magnification (vertical)</p> <p>10H: 1 magnification (horizontal) × 2 magnification (vertical)</p> <p>20H: 2 magnification (horizontal) × 1 magnification (vertical)</p> <p>30H: 2 magnification (horizontal) × 2 magnification (vertical)</p> <p>40H: 2 magnification (horizontal) × 3 magnification (vertical)</p> <p>50H: 3 magnification (horizontal) × 2 magnification (vertical)</p> <p>60H: 3 magnification (horizontal) × 3 magnification (vertical)</p> <p>70H: 3 magnification (horizontal) × 4 magnification (vertical)</p> <p>80H: 4 magnification (horizontal) × 3 magnification (vertical)</p> <p>90H: 4 magnification (horizontal) × 4 magnification (vertical)</p> |

Initial value n: 00H (1 magnification (horizontal) × 1 magnification (vertical))

- Explanation
- (1) When “n” is set to any value other than the above, a command error occurs.
  - (2) After this command is received, it is effective until the setting is changed again by the Character Magnification Command in spite of a line feed or printing.



**7.5.6 BARCODE HORIZONTAL SIZE COMMAND**

**[GS] w**

- |          |
|----------|
| Function |
|----------|

 Sets the horizontal size of the barcode. For QR code, the 1-cell width is set.
- |        |
|--------|
| Format |
|--------|

 [GS] wn
- |      |
|------|
| Term |
|------|

 n: Horizontal size of the barcode (1 byte)  
02H to 05H
- |               |
|---------------|
| Initial value |
|---------------|

 n: 02H
- |             |
|-------------|
| Explanation |
|-------------|

 (1) When “n” is set to any value other than the above, a command error occurs.  
(2) The horizontal size designated by this command is as follows.  
1 dot = 1/8 mm on the 203-dpi printer.

The maximum value varies depending on model and barcode type.

|               | Model         | B-EP2DL-GHxx | B-EP2DL-GHxx |
|---------------|---------------|--------------|--------------|
|               | Range         | 02H to 05H   | 02H to 0AH   |
|               | Initial value | 02H          | 02H          |
| JAN-system *1 | Max. value    | 03H          | 06H          |
| NW7-system *2 | Max. value    | 05H          | 0AH          |
| PDF417        | Max. value    | 03H          | 06H          |
| QR code       | Max. value    | 05H          | 0AH          |

\*1 The JAN system refers to JAN8, EAN8, EAN8 + 2 digits, EAN8 + 5 digits, JAN13, EAN13, EAN13 + 2 digits, EAN13 + 5 digits, EAN128, UCC/EAN128, CODE128, UPC-E, UPC-E + 2 digits, UPC-E + 5 digits, UPC-A, UPC-A + 2 digits, UPC-A + 5 digits and CODE93.

\*2 The NW7 system refers to NW7, CODE39, Interleaved 2 of 5 and MSI.

[JAN8, EAN8, EAN8 + 2 digits, EAN8 + 5 digits, JAN13, EAN13, EAN13 + 2 digits, EAN13 + 5 digits, EAN128, UCC/EAN128, CODE128, UPC-E, UPC-E + 2 digits, UPC-E + 5 digits, UPC-A, UPC-A + 2 digits, UPC-A + 5 digits, CODE93]

| n   | 1 module |       | 2 modules |       | 3 modules |       | 4 modules |       |
|-----|----------|-------|-----------|-------|-----------|-------|-----------|-------|
|     | Bar      | Space | Bar       | Space | Bar       | Space | Bar       | Space |
| 02H | 2        |       | 4         |       | 6         |       | 8         |       |
| 03H | 3        |       | 6         |       | 9         |       | 12        |       |
| 04H | 4        |       | 8         |       | 12        |       | 16        |       |
| 05H | 5        |       | 10        |       | 15        |       | 20        |       |
| 06H | 6        |       | 12        |       | 18        |       | 24        |       |
| 07H | 7        |       | 14        |       | 21        |       | 28        |       |
| 08H | 8        |       | 16        |       | 24        |       | 32        |       |
| 09H | 9        |       | 18        |       | 27        |       | 36        |       |

(Unit: dots)



[NW7, CODE39, Interleaved 2 of 5, MSI]

| n   | Narrow |       | Wide |       | Character-to-character space |
|-----|--------|-------|------|-------|------------------------------|
|     | Bar    | Space | Bar  | Space |                              |
| 02H | 2      | 2     | 5    | 5     | 2                            |
| 03H | 2      | 2     | 6    | 6     | 2                            |
| 04H | 3      | 3     | 8    | 8     | 3                            |
| 05H | 3      | 3     | 9    | 9     | 3                            |
| 06H | 4      | 4     | 11   | 11    | 4                            |
| 07H | 4      | 4     | 12   | 12    | 4                            |
| 08H | 5      | 5     | 14   | 14    | 5                            |
| 09H | 5      | 5     | 15   | 15    | 5                            |
| 0AH | 6      | 6     | 17   | 17    | 6                            |
| 0BH | 6      | 6     | 18   | 18    | 6                            |
| 0CH | 7      | 7     | 20   | 20    | 7                            |
| 0DH | 7      | 7     | 21   | 21    | 7                            |
| 0EH | 8      | 8     | 23   | 23    | 8                            |
| 0FH | 8      | 8     | 24   | 24    | 8                            |

(Unit: dots)

\* The character-to-character space does not exist in Interleaved 2 of 5 and MSI.

[PDF417]

| n   | 1 module |       | 2 modules |       | 3 modules |       | 4 modules |       | 5 modules |       | 6 modules |       |
|-----|----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
|     | Bar      | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space | Bar       | Space |
| 02H | 2        |       | 4         |       | 6         |       | 8         |       | 10        |       | 12        |       |
| 03H | 3        |       | 6         |       | 9         |       | 12        |       | 15        |       | 18        |       |
| 04H | 4        |       | 8         |       | 12        |       | 16        |       | 20        |       | 24        |       |
| 05H | 5        |       | 10        |       | 15        |       | 20        |       | 25        |       | 30        |       |
| 06H | 6        |       | 12        |       | 18        |       | 24        |       | 30        |       | 36        |       |
| 07H | 7        |       | 14        |       | 21        |       | 28        |       | 35        |       | 42        |       |
| 08H | 8        |       | 16        |       | 24        |       | 32        |       | 40        |       | 48        |       |
| 09H | 9        |       | 18        |       | 27        |       | 36        |       | 45        |       | 54        |       |

(Unit: dots)

[QR code]

| n   | 1-cell size |
|-----|-------------|
| 02H | 2           |
| 03H | 3           |
| 04H | 4           |
| 05H | 5           |
| 06H | 6           |
| 07H | 7           |
| 08H | 8           |
| 09H | 9           |

(Unit: dots)

Refer to:

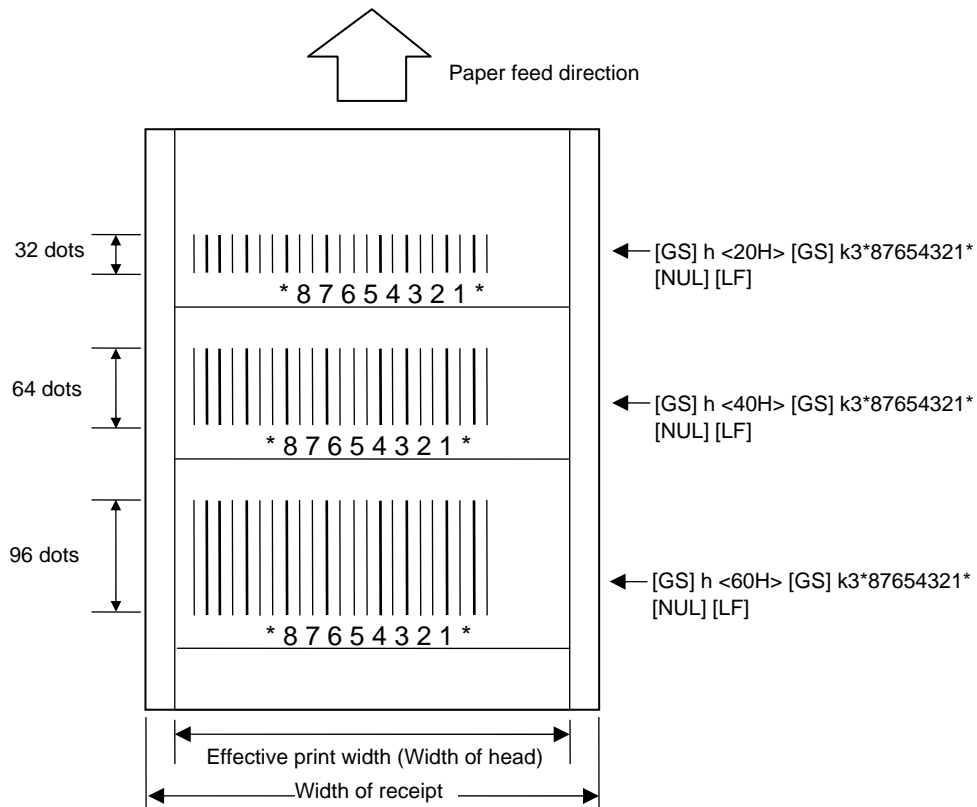
Barcode/Two-Dimensional Code Print Command ([GS] k)

**7.5.7 BARCODE HEIGHT COMMAND**

**[GS] h**

|               |                                                                                |
|---------------|--------------------------------------------------------------------------------|
| Function      | Sets the barcode height.                                                       |
| Format        | [GS] hn                                                                        |
| Term          | n: Barcode height (1 byte)<br>01H to FFH (1 to 255 dots)                       |
| Initial value | n: 68H (104 dots)                                                              |
| Explanation   | (1) When “n” is set to any value other than the above, a command error occurs. |

\* For PDF417, the bar height for one row is set by this command. Note that the height of the whole barcode cannot be set by this command. The PDF417 can have the maximum of 90 rows. Therefore, if 88 or more dots are specified, the PDF417 may not be stored in the image buffer. In that case, the printer’s operation is not guaranteed.

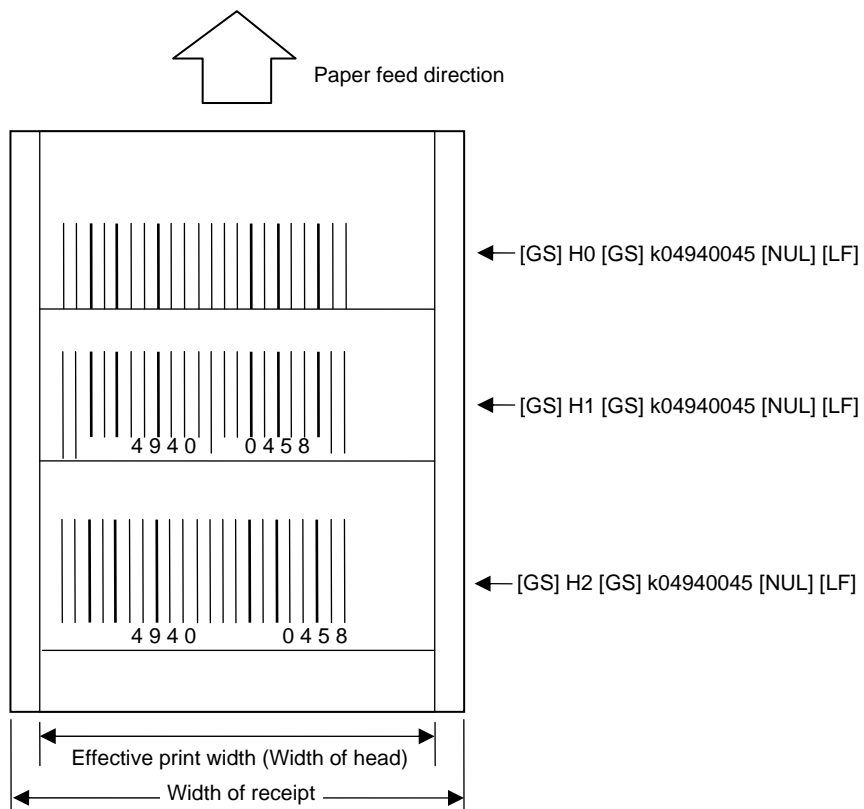


**Refer to** Barcode/Two-Dimensional Code Print Command ([GS] k)

**7.5.8 NUMERALS UNDER BARS COMMAND**

**[GS] Hn**

|               |                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets numerals under bars.                                                                                                                                                                                                                                                                 |
| Format        | [GS] Hn                                                                                                                                                                                                                                                                                   |
| Term          | n: Selection to print numerals under bars<br>0: Non-print<br>1: Print (with EAN guard bar)<br>2: Print (without EAN guard bar)                                                                                                                                                            |
| Initial value | n: 1: Print (with EAN guard bar)                                                                                                                                                                                                                                                          |
| Explanation   | (1) When “n” is set to any value other than the above, a command error occurs.<br>(2) For NW7, CODE39, Interleaved 2 of 5 and MSI, if “n” is set to “1” or “2,” printing is the same.<br>The length of the guard bar is fixed as follows:<br>• B-EP2DL-GHxx, B-EP4DL-GHxx: 16 dots (2 mm) |



|          |                                                     |
|----------|-----------------------------------------------------|
| Refer to | Barcode/Two-Dimensional Code Print Command ([GS] k) |
|----------|-----------------------------------------------------|

### 7.5.9 SECURITY LEVEL COMMAND

[GS] s

|               |                                                                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets the security level.                                                                                                                                           |
| Format        | [GS] sn                                                                                                                                                            |
| Initial value | n: 00H                                                                                                                                                             |
| Term          | n: Security level to be set<br>00: Level 0<br>01: Level 1<br>02: Level 2<br>03: Level 3<br>04: Level 4<br>05: Level 5<br>06: Level 6<br>07: Level 7<br>08: Level 8 |

**Explanation**

- (1) When “n” is set to any value other than the above, a command error occurs.
- (2) This command is effective for the PDF417 only. If this command is send for printing other barcode/two-dimensional codes, the command will be ignored.

**Refer to** Barcode/Two-Dimensional Code Print Command ([GS] k)

### 7.5.10 NO. OF COLUMNS (STRINGS) COMMAND

[GS] c

|               |                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets the number of columns (strings).                                                                                                                                                                                                             |
| Format        | [GS] cn                                                                                                                                                                                                                                           |
| Initial value | n: 06H                                                                                                                                                                                                                                            |
| Term          | n: No. of columns (strings)<br>01H to 1EH (01 to 30)                                                                                                                                                                                              |
| Explanation   | (1) When “n” is set to any value other than the above range, a command error occurs.<br>(2) This command is effective for the PDF417 only. If this command is sent for printing other barcode/two-dimensional codes, the command will be ignored. |
| Refer to:     | Barcode/Two-Dimensional Code Print Command ([GS] k)                                                                                                                                                                                               |

### 7.5.11 PRINT WIDTH COMMAND

[ESC] W

**Function** Sets the print width.

**Format** [ESC] Wnnn

**Initial value** nnn:

|     |              |
|-----|--------------|
| 384 | B-EP2DL-GHxx |
| 832 | B-EP4DL-GHxx |

**Term** nnn: No. of dots for the print width matching the receipt width (Fixed at 3 digits).

|           |       |              |
|-----------|-------|--------------|
| 216 ≤ nnn | ≤ 384 | B-EP2DL-GHxx |
|           | ≤ 832 | B-EP4DL-GHxx |

**Explanation** (1) When “nnn” is set to any value other than the above range, a command error occurs.

(2) The print width can be set, matching the receipt width. Using this command, the data can be printed properly at the position where the alignment (right or center) is specified. However, when paper width is smaller than the print head width, it is necessary to adjust the print start position to the paper width via X-direction Fine Adjustment through key operations, the Horizontal Print Position command or the Horizontal Offset Position command. This should be done since the print width is set using the center of the print head as an origin, not based on the left edge of the print head.

(3) If the printer receives this command while receiving one part of 1-line data, the printer prints the data which has been received before receiving this command, then sets the print width. However, printing of the line is not guaranteed.

(4) If the data is not included in the specified print width, the excess data is not printed.

**Refer to**

- Horizontal Print Position Command ([GS] H)
- Horizontal Offset Position Command ([GS] O)

### 7.5.12 HORIZONTAL PRINT POSITION COMMAND

[ESC] H

**Function** Sets the left margin of the line (space from the left edge).

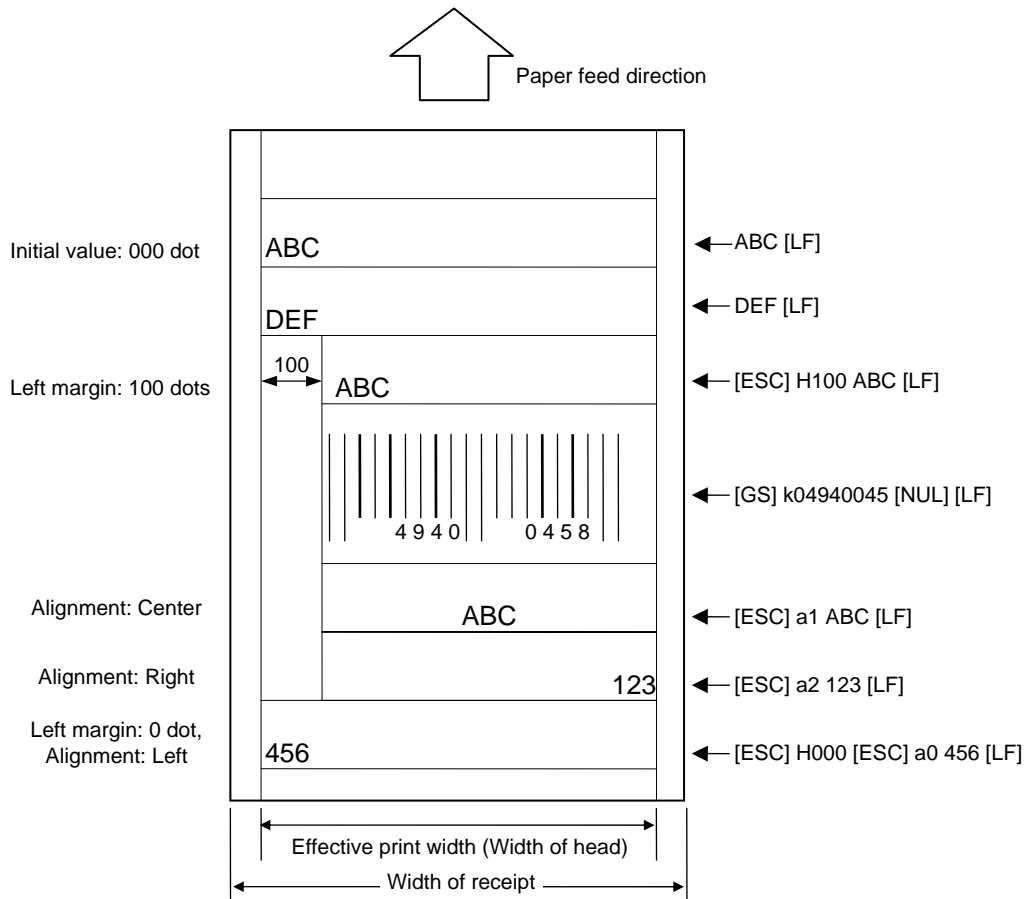
**Format** [ESC] Hnnn

**Initial value** nnn: 000 dot

**Term** nnn: No. of dots for the margin (space) from the left edge of the paper to the print start position (Fixed at 3 digits)

|     |        |              |
|-----|--------|--------------|
| 000 | to 383 | B-EP2DL-GHxx |
|     | to 831 | B-EP4DL-GHxx |

- Explanation**
- (1) When “nnn” is set to any value other than the above range, a command error occurs.
  - (2) This command is effective for all lines to be printed after it is received, until this command is received again, the setting is initialized by the Mode Select Command, or the power is turned off.
  - (3) When the alignment (left, right, center) is specified by the Position Align Command, the alignment is performed within the effective range excluding the left margin set by this command.
  - (4) In the case that the left margin is set for printing character strings and barcodes, if the data is not included within one line excluding the left margin, the excess data may be printed in the left margin on the next line. Do not send the data which is not included within one line.
  - (5) When this command is received while one part of 1-line data is being received, it becomes effective from the next line.
  - (6) If the print start position specified by this command is on the right of the right end of the print width specified by the Print Width Command ([ESC] W), a command error occurs.





**7.5.13 HORIZONTAL OFFSET POSITION COMMAND [ESC] O**

**Function** Sets the left margin (space from the left edge) of only the line.

**Format** [ESC] Oabbb  
[ESC] Ocadddd

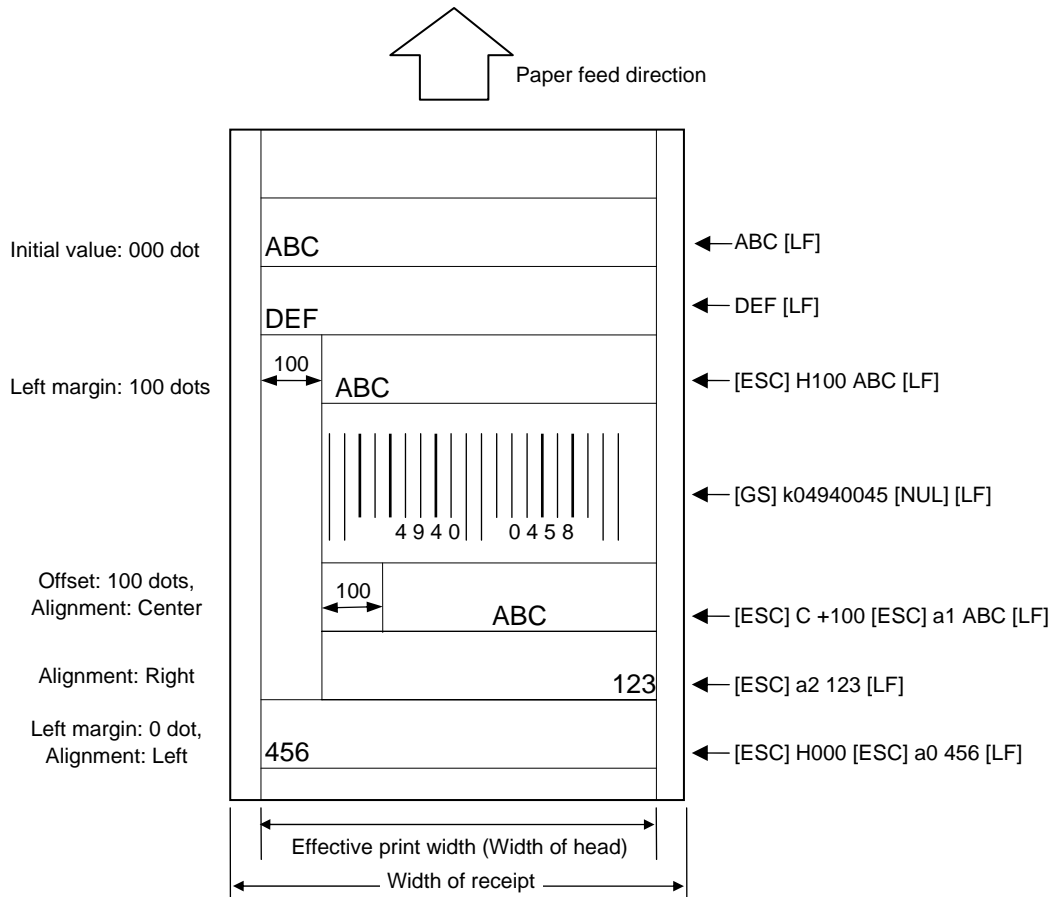
**Initial value** abbb: +000

**Term** a: Indicates whether the number of offset dots is increased or decreased  
+: Increased  
-: Decreased

bbb: No. of offset dots from the position specified by [ESC] H (Fixed at 3 digits)

|              |              |
|--------------|--------------|
| -383 to +383 | B-EP2DL-GHxx |
| -831 to +831 | B-EP4DL-GHxx |

- Explanation**
- (1) When “a” or “bbb” is set to any value other than the above range, a command error occurs.
  - (2) If other data is received after the horizontal offset position is specified again by this command even though the data has already been drawn on the line, it is printed at the position specified by this command. Therefore, it is printed over the already drawn data.
  - (3) This command is effective until a line feed is performed. After a line feed is performed, printing is performed at the print start position specified by the Horizontal Print Position Command ([ESC] H).
  - (4) If the print start position specified by this command is on the right of the right end of the print width specified by the Print Width Command ([ESC] W), a command error occurs.
  - (5) If the print start position specified by this command is on the left of the print start position specified by the Horizontal Print Position Command ([ESC] H), or the left edge of the paper, a command error occurs.



### 7.5.14 CHARACTER ROTATE COMMAND

[ESC] R

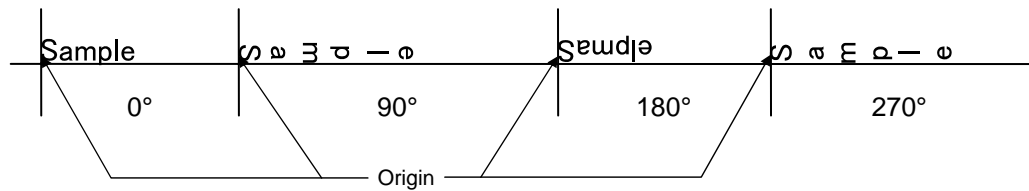
**Function** Specifies the rotational angle of characters.

**Format** [ESC] Rn

**Initial value** n: 0

**Term** n: Rotational angle of characters  
 0: 0°  
 1: 90°  
 2: 180°  
 3: 270°

- Explanation**
- (1) When "n" is set to any value other than the above, a command error occurs.
  - (2) The characters are rotated as shown below:



\* When characters are rotated, they are not aligned to the reference line, because each font has a different parameter for the print position. If the character magnification is changed, they are not aligned to the reference line either.

### 7.5.15 ERROR CORRECTION LEVEL SET COMMAND

[GS] q

|               |                                                                                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets the error correction level.                                                                                                                                                                                                             |
| Format        | [GS] qn                                                                                                                                                                                                                                      |
| Term          | n: Error correction level to be set<br>L: High density level<br>M: Standard level<br>Q: Reliability level<br>H: High reliability level                                                                                                       |
| Initial value | n: M (Standard level)                                                                                                                                                                                                                        |
| Explanation   | (1) When “n” is set to any value other than the above, a command error occurs.<br>(2) This command is effective for the QR code only. If this command is set when printing other barcode/two-dimensional codes, the command will be ignored. |
| Refer to      | Barcode/Two-Dimensional Code Print Command ([GS] k)                                                                                                                                                                                          |

### 7.5.16 QR CODE MODEL SET COMMAND

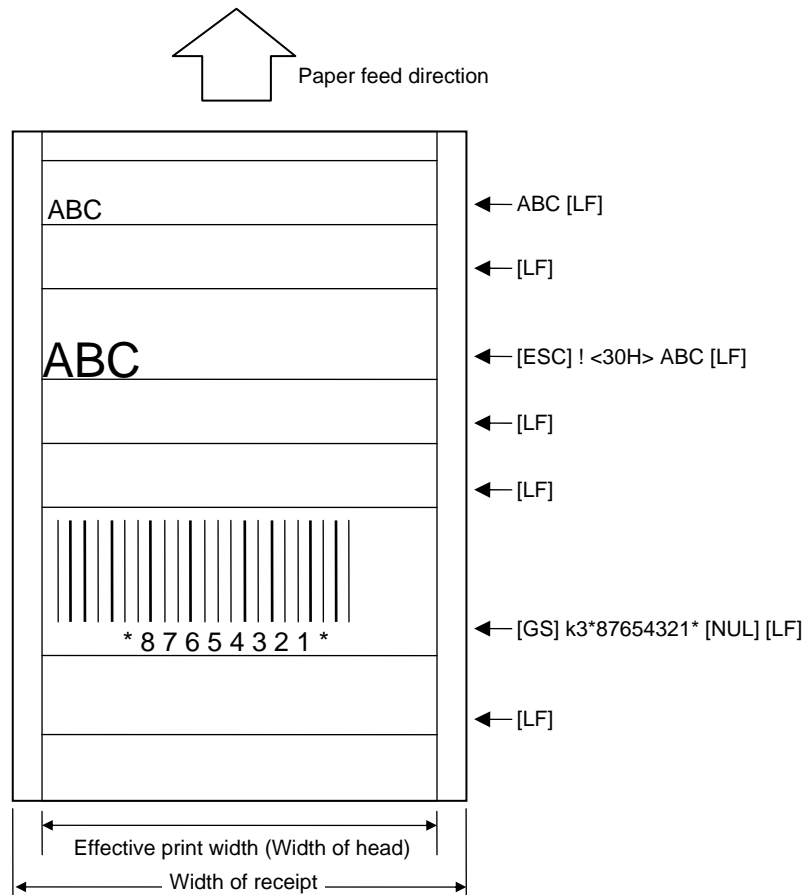
[GS] r

|               |                                                                                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets the model of the QR code.                                                                                                                                                                                                               |
| Format        | [GS] rn                                                                                                                                                                                                                                      |
| Term          | n: Model to be set<br>1: Model 1<br>2: Model 2                                                                                                                                                                                               |
| Initial value | n: 1 (Model 1)                                                                                                                                                                                                                               |
| Explanation   | (1) When “n” is set to any value other than the above, a command error occurs.<br>(2) This command is effective for the QR code only. If this command is set when printing other barcode/two-dimensional codes, the command will be ignored. |
| Refer to      | Barcode/Two-Dimensional Code Print Command ([GS] k)                                                                                                                                                                                          |

## 7.6 COMMANDS RELATED TO ISSUE AND FEED

### 7.6.1 PRINT LINE FEED COMMAND [LF]

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Prints the received data and performs a line feed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format      | [LF]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Explanation | <ol style="list-style-type: none"> <li>(1) When the Print Line Feed Command is received without data to be printed, only the length of the line feed which has been set is performed.</li> <li>(2) In the RECEIPT mode, the printer is operated without designating the sensor.</li> <li>(3) Since the printer does not perform a line feed automatically, be sure to send the Print Line Feed Command for each data which can be included within one line. If data which is not included within one line is received, characters cannot be printed in the proper position.</li> <li>(4) Although this command is received in page mode, it is ignored.</li> </ol> |



|          |                                        |
|----------|----------------------------------------|
| Refer to | Line Feed Length Set Command ([ESC] 3) |
|----------|----------------------------------------|

## 7.6.2 BACK FEED OMISSION COMMAND

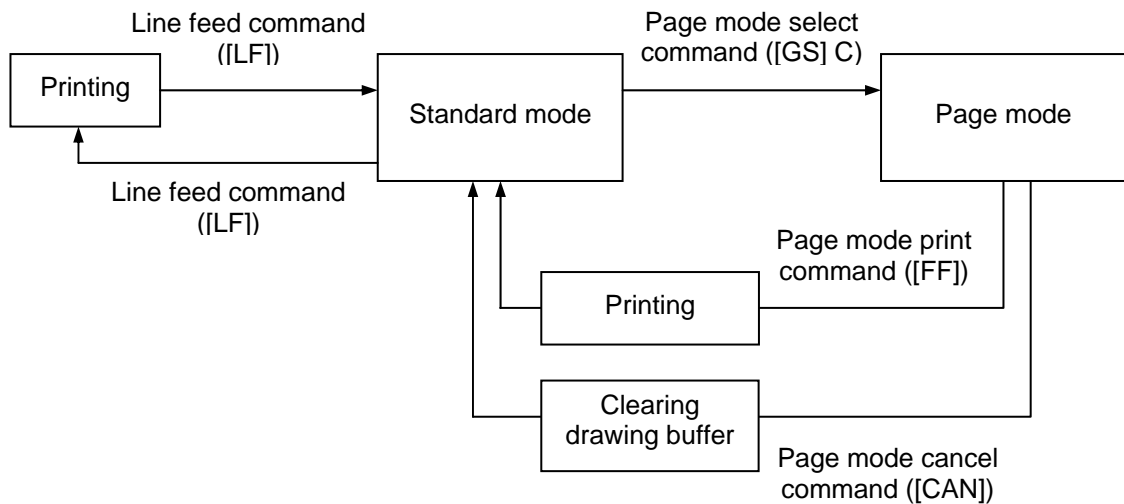
[ESC] B

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Omits a back feed before printing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Format      | [ESC] B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Explanation | <p>(1) Usually, in the RECEIPT mode, the printer feeds for about 1-mm backward before starting to print or before printing after a pause. This is intended to adjust the print start position (line feed), however, the first back feed may be unnecessary depending on the print layout. Also, a back feed can reduce the throughput. So, the first back feed can be omitted by this command, if unnecessary.</p> <p>(2) This command can be sent only once for one receipt prior to other receipt commands or print data. If this command is sent in the middle of other commands, the printer operation is not guaranteed (Necessary back feeds are not performed, and, as a result, the print may be overlapped or the print position is misaligned.) This command is effective in the first receipt to be printed after the command is received. That is, this command needs to be issued for every receipt before printing because the command is effective only one receipt.</p> <p>NOTE: When printing more than one receipt continuously, the printer does not stop at the top of each receipt because the printer does not recognize the receipt one by one. In this case, the Back Feed Omission Command should be issued only for the first receipt, not for every receipt. (The printer recognizes the Back Feed Omission Command is sent in the middle of other commands, and it may print improperly.)</p> <p>(3) If a cover open error or a paper end error occurred before printing, a back feed is performed after the error is cleared, even if this command has been issued. Also, the printer performs a back feed when printing is restarted after clearing an error which occurred during printing.</p> |

**7.6.3 PAGE MODE SELECT COMMAND**

**[GS] C**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Changes to page mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Format      | [GS] C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Explanation | <p>(1) When any data remains unprinted before the Page Select command is received, the data is printed before changing to page mode.</p> <p>(2) The printer performs a line feed only without printing in page mode even if the Line Feed command ([LF]) is received.</p> <p>(3) By sending the Page Mode Print Command ([FF]), print data received in page mode can be printed collectively.</p> <p>(4) To cancel the page mode and return to usual print and line feed operations using the Print and Line Feed Command ([LF]) for each line, or to disable issue of data received in page mode, page mode can be canceled by sending the Page Mode Cancel Command ([CAN]) until the Page Mode Print Command is received.</p> <p>(5) When this command is received in page mode, it is ignored.</p> <p>(6) Length to be printed collectively is 1000.0 mm. When data length to be printed exceeds the above value, the subsequent data is discarded and printing is not performed until the Page Mode Print Command ([FF]) is received.</p> |





#### 7.6.4 PAGE MODE PRINT COMMAND

**[FF]**

|             |                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Starts printing in page mode.                                                                                                                                                                                                                                                                                                                                                                   |
| Format      | [FF]                                                                                                                                                                                                                                                                                                                                                                                            |
| Explanation | <ol style="list-style-type: none"><li>(1) This command is used to print data received in page mode.</li><li>(2) After printing the data received in page mode, the printer returns to usual print and line feed operations using the Print and Line Feed Command ([LF]) for each line.</li><li>(3) This command is ignored when it is received while the printer is not in page mode.</li></ol> |

### 7.6.5 PAGE MODE CANCEL COMMAND

[CAN]

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Cancels page mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Format      | [CAN]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Explanation | <ol style="list-style-type: none"><li>(1) Data received in page mode is cleared.</li><li>(2) Values set before the Page Mode Select Command is sent, or set in page mode are retained.</li><li>(3) This command is ignored when it is received while the printer is not in page mode.</li><li>(4) To cancel the page mode and return to usual print and line feed operations using the Print and Line Feed Command ([LF]) for each line, or to disable issue of data received in page mode, page mode can be canceled by sending the Page Mode Cancel Command ([CAN]) until the Page Mode Print Command ([FF]) is received.</li></ol> |

## 7.7 COMMANDS RELATED TO FORMAT

### 7.7.1 FLASH MEMORY FORMAT COMMAND

[ESC] J1

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Formats (Initializes) flash ROM on the CPU board.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Format      | [ESC] J1; a [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Term        | a: Format (Initialization) designation<br>A: Form storage area<br>B: Writable character storage area<br>C: Graphic storage area<br>D: All storage areas (Form, Writable character, Graphic)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Explanation | (1) When the storage area in flash ROM becomes full, the old data is automatically deleted and only the newest data is left.<br>Only the form storage area in flash ROM can be forcefully cleared by this command. However, if this command is sent, all data of the stored forms, including the newest data, is deleted (initialized).<br><br>(2) The remaining capacity of flash memory after formatting is displayed on the LCD.<br><br>(3) Whenever already registered data (PC saving, writable character or logo) is registered again, memory is consumed unless a format command is sent.<br><br>(4) When label issue is performed after a format command is sent, the image buffer is cleared automatically. |
| Note        | (1) Since the writable character storage area is shared by the LABEL and TPCL modes, writable characters registered in the LABEL or TPCL mode are erased.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

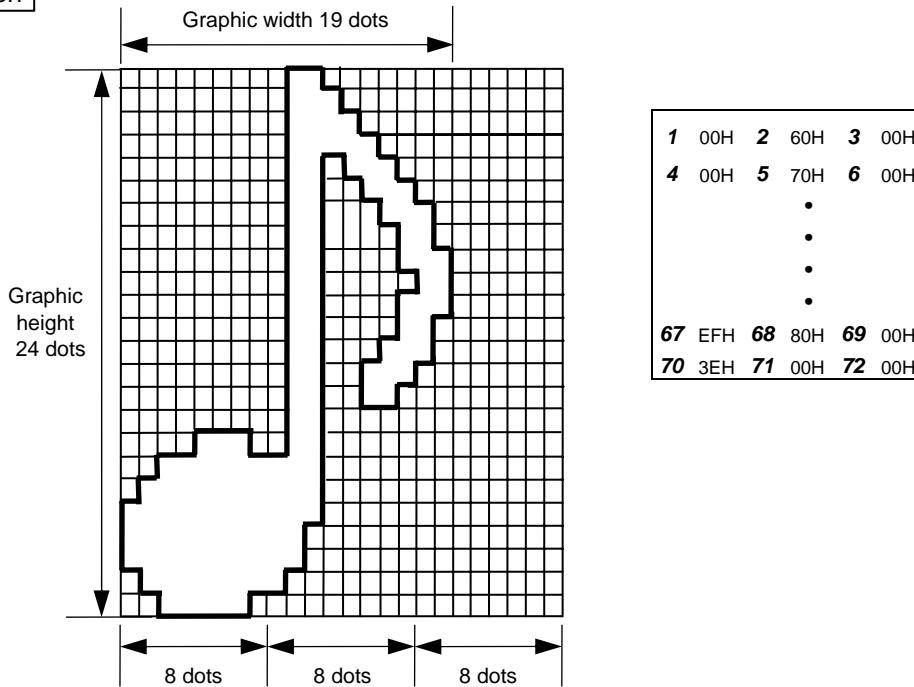
## 7.8 COMMANDS RELATED TO GRAPHICS

### 7.8.1 GRAPHIC DATA STORE COMMAND

[ESC] SG

|          |                                                                                                                                                                                                                                                                                                                                                                        |              |         |              |  |         |              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------|--------------|--|---------|--------------|
| Function | Stores the graphic data on the printer.                                                                                                                                                                                                                                                                                                                                |              |         |              |  |         |              |
| Format   | [ESC] SG; a, bbbb, cccc, ddd --- ddd [LF] [NUL]                                                                                                                                                                                                                                                                                                                        |              |         |              |  |         |              |
| Term     | <p>a: Graphic No.<br/>1 or 2</p> <p>bbbb: No. of graphic width dots to be stored</p> <table border="1"> <tr> <td>0001</td> <td>to 0384</td> <td>B-EP2DL-GHxx</td> </tr> <tr> <td></td> <td>to 0832</td> <td>B-EP4DL-GHxx</td> </tr> </table> <p>cccc: No. of graphic height dots to be stored<br/>0001 to 9999 (in units of dots)</p> <p>ddd --- ddd: Graphic data</p> | 0001         | to 0384 | B-EP2DL-GHxx |  | to 0832 | B-EP4DL-GHxx |
| 0001     | to 0384                                                                                                                                                                                                                                                                                                                                                                | B-EP2DL-GHxx |         |              |  |         |              |
|          | to 0832                                                                                                                                                                                                                                                                                                                                                                | B-EP4DL-GHxx |         |              |  |         |              |

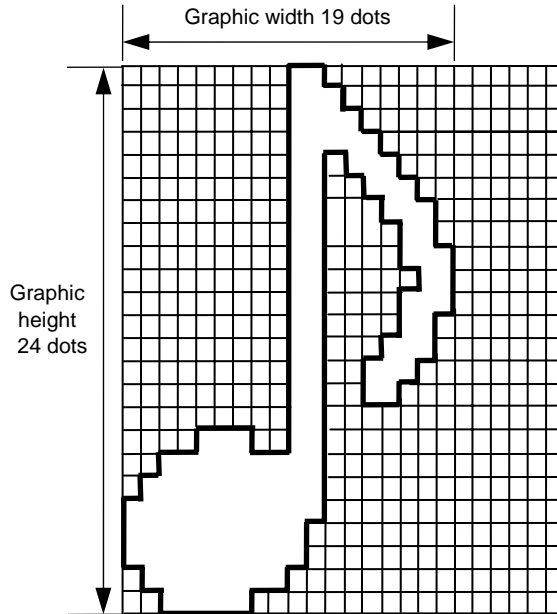
#### Explanation



- (1) The graphic data should be separated into units of 8 dots and sent in the above order (**1** to **72**).
- (2) The graphic data is 00H to FFH.
- (3) The minimum unit of a graphic width is 8 dots. Dots with no data are transmitted as data 0.
- (4) The number of bytes of the graphic to be transmitted must be as follows;  
The number of bytes of the graphic to be transmitted = {(No. of graphic width dots + 7)/8} × No. of graphic height dots

\* The value in the brackets is rounded down to the nearest whole number.

Example

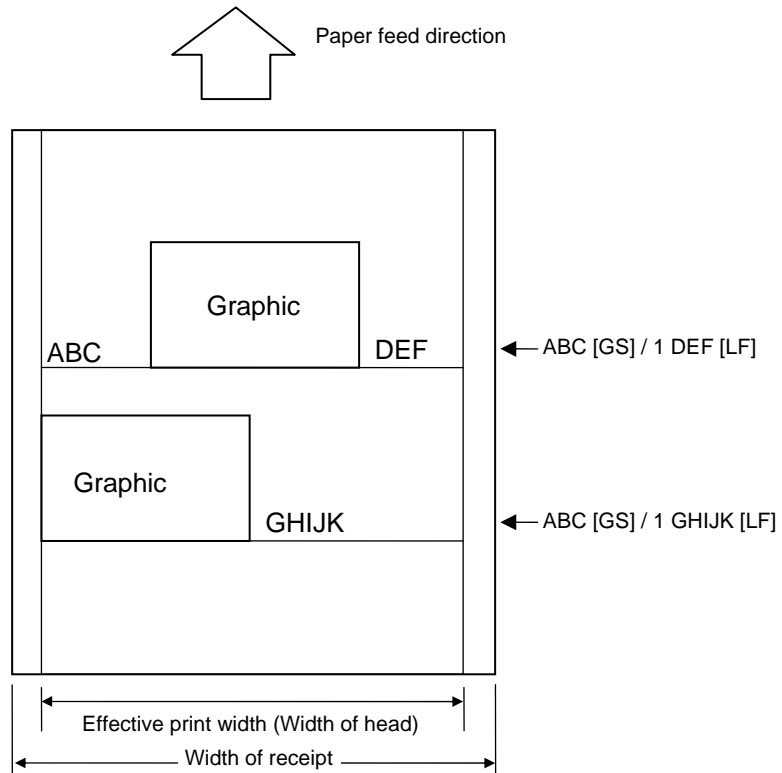


```
[ESC] SG; 1, 0019, 0024,
[00H] [60H] [00H] [00H] [70H] [00H] [00H] [78H] [00H]
[00H] [7CH] [00H] [00H] [6EH] [00H] [00H] [67H] [00H]
[00H] [63H] [80H] [00H] [61H] [80H] [00H] [61H] [C0H]
[00H] [60H] [C0H] [00H] [61H] [C0H] [00H] [61H] [80H]
[00H] [63H] [80H] [00H] [67H] [C0H] [00H] [66H] [00H]
[0FH] [60H] [00H] [0EH] [60H] [00H] [3FH] [E0H] [00H]
[7FH] [FEH] [00H] [FFH] [E0H] [00H] [FFH] [C0H] [00H]
[FFH] [C0H] [00H] [EFH] [80H] [00H] [3EH] [00H] [00H]
[LF] [NUL]
```

**7.8.2 GRAPHIC PRINT COMMAND**

**[GS] /**

|             |                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Prints the graphic data which is stored on the printer.                                                                                             |
| Format      | [GS] /n                                                                                                                                             |
| Term        | n: Graphic No.<br>1 or 2                                                                                                                            |
| Explanation | (1) When “n” is set to any value other than the above, a command error occurs.<br>(2) When the graphic data is not stored, this command is ignored. |



|          |                                                                        |
|----------|------------------------------------------------------------------------|
| Refer to | Graphic Data Store Command ([ESC] SG)<br>Mode Select Command ([ESC] M) |
|----------|------------------------------------------------------------------------|

## 7.9 COMMANDS RELATED TO CONTROL

### 7.9.1 INITIALIZE COMMAND

[ESC] @, [ESC] WR

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Returns the printer to its initial state.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Format      | [ESC] WR [LF] [NUL]<br>[ESC] @                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Explanation | <ol style="list-style-type: none"> <li>(1) The printer is returned to the same state as when the power is turned on.</li> <li>(2) If the printer receives this command during printing, the printer prints the label which is being printed, then performs initialization.</li> <li>(3) After the Initialize Command is sent (or after printing is completed, if printing is performed), the next command must not be sent within approx. 30 seconds on the wireless LAN model or within 5 seconds on other models since the printer perform initialization. In IrDA: TEC Protocol, if ACK/status transmission is specified by the Issue Command, the printer returns an ACK, which indicates the command process end, to the EOT after the printer is initialized. In RS-232C, when the status response is specified, the printer returns the status (10H). After this status is received, the next command may be sent. In IrDA: IrCOMM, IrDA: IrOBEX, RS-232C, Bluetooth, or Wireless LAN, the printer does not return the status.</li> <li>(4) To use IrDA interface for sending this command to the printer, only this command should be sent. After the command is sent, the link should be terminated. Even if the host does not terminate the link, the printer performs the termination process. Therefore, after initialization is completed, the host should establish the link again.</li> <li>(5) When receiving this command during data transmission, the printer is initialized after transmission is completed.</li> </ol> |
| Notes       | <ol style="list-style-type: none"> <li>(1) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the SYSTEM mode.</li> <li>(2) After the code of the Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specifying the type of data.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

## 7.10 COMMANDS RELATED TO STATUS

### 7.10.1 STATUS REQUEST COMMAND

[ESC] v, [ [ESC] FM, [ESC] WS

|             |                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------|
| Function    | Requests that the printer sends back the printer status and the battery status to the host.         |
| Format      | [ESC] v, [ESC] FM [LF] [NUL], or [ESC] WS [LF] [NUL]                                                |
| Explanation | When this command is received, the printer sends the printer status and battery status to the host. |

- For IrDA: TEC Protocol: Data to be sent (Fixed at 27 bytes)

| STX | Printer ID |     | Version No. of each form |     |       |     | Printer status | Battery status |     | CRC |  |
|-----|------------|-----|--------------------------|-----|-------|-----|----------------|----------------|-----|-----|--|
| 02H | xxH        | xxH | V01                      | V02 | ..... | V20 | xxH            | xxH            | xxH | xxH |  |

- For IrDA; IrCOMM, IrDA: IrOBEX, RS-232C, USB, Bluetooth or Wireless LAN:  
Data to be sent (Fixed at 5 bytes)

| STX | Printer ID |     | Printer status | Battery status |
|-----|------------|-----|----------------|----------------|
| 02H | xxH        | xxH | xxH            | xxH            |

Printer ID.....2-byte hex data (in order from High to Low)

Printer status.....Printer status is indicated in 1-byte data.

- 00H: Normal status (while idling)
- 01H: Cover open status
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Operating
- 0CH: Communication error ..... For RS-232C connection only
- 0DH: Normal end + Label end (See **NOTE**.)
- 0EH: Flash ROM storage area full state
- 10H: Normal issue end
- 14H: Pause state
- 19H: Ambient temperature error
- 32H: Abnormal battery temperature
- 33H: Battery excessive temperature
- 37H: Charging error
- (38H: Bluetooth setting successfully completed)  
Response status for automatic status transmission
- 39H: Bluetooth setup error (including initialization error)
- 45H: Wait for battery recovery
- 46H: Wait for print head temperature reduction
- 47H: Wait for motor temperature reduction
- 55H: Writable character/PC command save mode



Status in the compatible mode for B-SP series

- 00H: Normal state (idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature  
( including ambient temperature error, abnormal battery temperature and battery excessive temperature )
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Printer operating  
( including the following statuses: wait for strip, pause state, writable character/PC command save mode, wait for battery recovery and wait for print head/motor temperature reduction )
- 0CH: Communication error ..... For RS-232C connection only
- 0DH: Normal end + Label end (See **NOTE**.)
- 0EH: Flash ROM storage area full state
- 10H: Normal issue end
- 37H: Charging error
- (38H: Bluetooth setting successfully completed)  
Response status for automatic status transmission
- 39H: Bluetooth setup error (including initialization error)

**NOTE:** 0DH (Normal issue end + Label end) is a state when the printer runs out of labels, after a label is issued.

Battery status ..... The battery charge status is indicated in 5 levels.

(B-EP2DL)

- 01H: 7.2 V or less
- 02H: 7.3 V to 7.4 V
- 03H: 7.5 V to 7.7 V
- 04H: 7.8 V to 7.9 V
- 05H: 8.0 V to 8.4 V

(B-EP4DL)

- 01H: 14.0 V or less
- 02H: 14.1 V to 14.6 V
- 03H: 14.7 V to 15.2 V
- 04H: 15.3 V to 15.9 V
- 05H: 16.0 V to 16.8 V

CRC.....2-byte hex data (in order from Low to High)

### 7.10.2 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND [ESC] WB

**Function** Sends information on the printer status and the free space of the receive buffer to the host.

**Format** [ESC] WB [LF] [NUL]

- Explanation**
- (1) This command makes the printer send information on its status and free space of the receive buffer, regardless of the setting of the Status Response parameter.
  - (2) The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted.
  - (3) Free space of the receive buffer for the interface which sent this command, is returned to the host.

[IrDA: TEC Protocol] Data to be transmitted (fixed at 22 bytes)

| STX | Printer ID |     | Status | Remaining No. of labels |     |     |     | Length |     |
|-----|------------|-----|--------|-------------------------|-----|-----|-----|--------|-----|
| 02H | 3xH        | 3xH | 33H    | 3xH                     | 3xH | 3xH | 3xH | 32H    | 32H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CRC |     |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

Data to be transmitted (fixed at 23 bytes)

| SOH | STX | Printer status |     | Status type | Remaining No. of labels |     |     |     | Length |     |
|-----|-----|----------------|-----|-------------|-------------------------|-----|-----|-----|--------|-----|
| 01H | 02H | 3xH            | 3xH | 33H         | 3xH                     | 3xH | 3xH | 3xH | 32H    | 33H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CR  | LF  |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | 0DH | 0AH |

Printer status.....Printer status is indicated in 2-byte data.

- “00”: Normal status
- “01”: Cover open state
- “02”: Operating
- “04”: Pause state
- “05”: Wait for strip
- “06”: Command syntax error (including Ir packet error)
- “09”: Normal issue end + Label end
- “11”: Paper jam
- “13”: Label end
- “15”: Cover open error
- “17”: Broken thermal print head dots
- “18”: Thermal head excessive temperature
- “19”: Ambient temperature error
- “32”: Abnormal battery temperature
- “33”: Battery excessive temperature
- “36”: Low battery
- “37”: Charging error
- “39”: Bluetooth setup error (including initialization error)
- “45”: Wait for battery recovery
- “46”: Wait for print head temperature reduction
- “47”: Wait for motor temperature reduction
- “50”: Flash ROM write error
- “51”: Flash ROM erase error
- “54”: Flash ROM storage area full state
- “55”: Writable character/PC command save mode

Remaining No. of labels .....Indicates the remaining number of labels in four bytes.  
“0000” to “9999”

Length: ..... Indicates the number of bytes of the entire status data  
IrDA: TEC Protocol: Fixed at “22.”  
IrDA: IrCOMM, IrDA: IrOBEX, USB,  
RS-232C, Bluetooth, Wireless LAN: Fixed at “23.”

Receive buffer free space:....Indicates the free space of the receive buffer.

Entire receive buffer free space:.... Indicates the entire free space of the receive buffer.  
Fixed at “00512.”

CRC/CR, LF:..... Indicates the end of the status block.

Notes

- (1) The status is returned only to the interface which sent this command.
- (2) The printer returns the same status, regardless of whether or not the compatible mode for the B-SP series is set.
- (3) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specified for the type of data.
- (4) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends a status.
- (5) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec., the printer may fail to receive it.

Example

[ESC] WB [LF] [NUL]

**7.10.3 MODE INFORMATION ACQUIRE COMMAND**

**[ESC] WX**

**Function** Sends the printer mode information to the host.

**Format** [ESC] WX [LF] [NUL]

**Explanation** (1) The mode information format to be sent to the host, is as follows:

RECEIPT mode (Mode = 1)

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | R                           | E   | C   | E   | I   | P   | T   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 52H                         | 45H | 43H | 45H | 49H | 50H | 54H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | R                           | E   | C   | E   | I   | P   | T   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |
| 02H | 52H                         | 45H | 43H | 45H | 49H | 50H | 54H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

RECEIPT1 mode (Mode = 2)

[IrDA: TEC Protocol]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | R                           | E   | C   | E   | I   | P   | T   | 1   | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |
| 02H | 52H                         | 45H | 43H | 45H | 49H | 50H | 54H | 31H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     | R                           | E   | C   | E   | I   | P   | T   | 1   | SP  | SP  | SP  | SP  | SP  | SP  | SP  |
| 02H | 52H                         | 45H | 43H | 45H | 49H | 50H | 54H | 31H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

The above shows examples where the message is received in the RECEIPT mode (Mode = 1) and the RECEIPT1 mode (Mode = 2). In addition, the messages described on the following page are returned.

- When the compatible mode for the B-SP series is on.

|                                                        |                                                             |               |
|--------------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                              | TPCL                                                        |               |
| TPCL1 mode                                             | TPCL1                                                       |               |
| LABEL mode                                             | LABEL                                                       |               |
| RECEIPT mode                                           | RECEIPT                                                     |               |
| RECEIPT1 mode                                          | RECEIPT1                                                    |               |
| ESC/POS mode                                           | ESC/POS                                                     |               |
| Online reset menu                                      | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys            | USER ■ SYSTEM                                               |               |
| SYSTEM mode for<br>administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                        | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                        | When the password setting is off                            | SYSTEM        |
| TPCL (strip issue mode)                                | TPCL ■ (S)                                                  |               |
| TPCL1 (strip issue mode)                               | TPCL1 (S)                                                   |               |
| LABEL (strip issue mode)                               | LABEL (S)                                                   |               |

\* ■ indicates a space.

- When the compatible mode for the B-SP series is off.

|                                                        |                                                             |               |
|--------------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                              | TPCL-LE                                                     |               |
| TPCL1 mode                                             | TPCL-LE1                                                    |               |
| LABEL mode                                             | LABEL                                                       |               |
| RECEIPT mode                                           | RECEIPT                                                     |               |
| RECEIPT1 mode                                          | RECEIPT1                                                    |               |
| ESC/POS mode                                           | ESC/POS                                                     |               |
| Online reset menu                                      | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys            | USER ■ SYSTEM                                               |               |
| SYSTEM mode for<br>administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                        | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                        | When the password setting is off                            | SYSTEM        |

\* ■ indicates a space.

**7.10.4 VERSION INFORMATION ACQUIRE COMMAND [ESC] WV**

**Function** Sends information such as the program version of the printer.

**Format** [ESC] WV [LF] [NUL]

**Explanation** (1) The format of the program version data to be returned to the host is as follows.

[IrDA: TEC Protocol]

|               |     |     |                                                                                                                      |
|---------------|-----|-----|----------------------------------------------------------------------------------------------------------------------|
| STX           |     | 02H |                                                                                                                      |
| Creation date | "0" | 30H | Creation date of the program:<br>9-byte data indicated in order of Day-<br>Month-Year                                |
|               | "4" | 34H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "R" | 52H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "8" | 38H |                                                                                                                      |
| Model         | "B" | 42H | Model:<br>7-byte ASCII code indicating the model<br>B-EP2DG (2-inch/203-dpi model)<br>B-EP4DG (4-inch/203-dpi model) |
|               | "." | 2DH |                                                                                                                      |
|               | "E" | 45H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "D" | 44H |                                                                                                                      |
|               | "G" | 47H |                                                                                                                      |
| Version       | "V" | 56H | Program version:<br>5-byte data: Vx.xx<br>└── Revision<br>└── Version                                                |
|               | "1" | 31H |                                                                                                                      |
|               | "." | 2EH |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
| CRC           |     | xxH |                                                                                                                      |
| CRC           |     | xxH |                                                                                                                      |

[IrDA: IrCOMM, IrDA: IrOBEX, RS-232C, Bluetooth, Wireless LAN]

|               |     |     |                                                                                                                      |
|---------------|-----|-----|----------------------------------------------------------------------------------------------------------------------|
| SOH           |     | 01H |                                                                                                                      |
| STX           |     | 02H |                                                                                                                      |
| Creation date | "0" | 30H | Creation date of program:<br>9 bytes of data indicated in order of Day-<br>Month-Year                                |
|               | "4" | 34H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "R" | 52H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "8" | 38H |                                                                                                                      |
| Model         | "B" | 42H | Model:<br>7-byte ASCII code indicating the model<br>B-EP2DG (2-inch/203-dpi model)<br>B-EP4DG (4-inch/203-dpi model) |
|               | "_" | 2DH |                                                                                                                      |
|               | "E" | 45H |                                                                                                                      |
|               | "P" | 50H |                                                                                                                      |
|               | "2" | 32H |                                                                                                                      |
|               | "D" | 44H |                                                                                                                      |
|               | "G" | 47H |                                                                                                                      |
| Version       | "V" | 56H | Program version:<br>5 bytes of data: Vx.xx<br>└── Revision<br>└── Version                                            |
|               | "1" | 31H |                                                                                                                      |
|               | "." | 2EH |                                                                                                                      |
|               | "0" | 30H |                                                                                                                      |
|               | "A" | 41H |                                                                                                                      |
| ETX           |     | 03H |                                                                                                                      |
| EOT           |     | 04H |                                                                                                                      |
| CR            |     | 0DH |                                                                                                                      |
| LF            |     | 0AH |                                                                                                                      |

Notes

- (1) No statuses are returned when using USB.



**7.10.5 PRINTER SERIAL NUMBER ACQUIRE COMMAND [ESC] WY**

**Function** Sends the printer serial number to the host.

**Format** [ESC] WY [LF] [NUL]

**Explanation**

- (1) The format of the printer serial No. to be returned to the host is as follows.

[IrDA: TEC Protocol]

|     |                    |     |     |
|-----|--------------------|-----|-----|
| STX | Printer serial No. | CRC | CRC |
| 02H | 32 bytes           | XXH | XXH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |                    |
|-----|--------------------|
| SOH | Printer serial No. |
| 02H | 32 bytes           |

When the printer serial No. is "2308M000001":

[32H][33H][30H][38H][4DH][30H][30H][30H][30H][30H][31H][00H][00H][00H][00H][00H]  
 2 3 0 8 M 0 0 0 0 0 0 1  
 [00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H]

\* The remaining bytes of 32 bytes are filled with 00H.

**Example** [ESC] WY [LF] [NUL]

## 7.11 COMMANDS RELATED TO BLUETOOTH AND WIRELESS LAN

### 7.11.1 DEVICE ADDRESS ACQUIRE COMMAND [ESC] IT

**Function** Reads the device address of the Bluetooth or MAC address of the Wireless LAN.

**Format** [ESC] IT [LF] [NUL]

**Explanation** (1) This command reads the device address of the Bluetooth or MAC address of the Wireless LAN. When using the IrDA, the following information field is placed in the information frame and sent.

[Information field to be sent when IrDA: TEC Protocol is used]

|     |                                                      |     |     |
|-----|------------------------------------------------------|-----|-----|
| STX | Bluetooth device address or Wireless LAN MAC address | CRC |     |
| 02H | 12 bytes                                             | xxH | xxH |

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN is used]

|     |                                                      |
|-----|------------------------------------------------------|
| STX | Bluetooth device address or Wireless LAN MAC address |
| 02H | 12 bytes                                             |

The printer sends the following information:

Bluetooth device address: 0015b5aa0005  
Wireless LAN MAC address: 000940387630

Bluetooth device address

[30H] [30H] [31H] [35H] [62H] [35H] [61H] [61H] [30H] [30H] [30H] [35H]  
0 0 1 5 b 5 a a 0 0 0 5

Wireless LAN MAC address

[30H] [30H] [30H] [39H] [34H] [30H] [33H] [38H] [37H] [36H] [33H] [30H]  
0 0 0 9 4 0 3 8 7 6 3 0

### 7.11.2 BLUETOOTH RELATED PARAMETER ACQUIRE COMMAND [ESC] WT

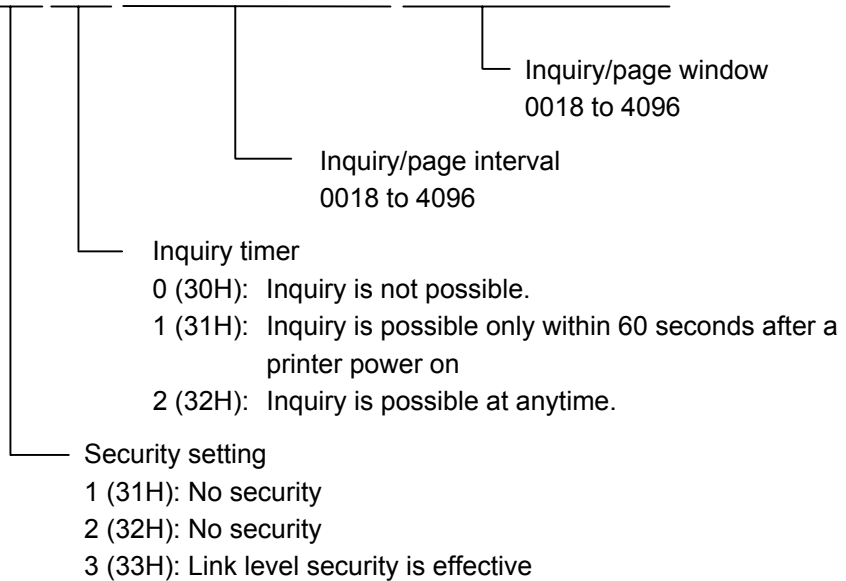
**Function** Acquires the parameter settings related to the Bluetooth.

**Format** [ESC] WT [LF] [NUL]

**Explanation** (1) This command reads the parameters related to the Bluetooth. When using the IrDA, the following information field is placed in the information frame and sent.

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |



| Bluetooth device name | CRC |     |
|-----------------------|-----|-----|
| 32 bytes              | xxH | xxH |

Bluetooth device name: Fixed at 32 bytes.

When the Bluetooth device name is "TOSHIBA TEC BT."

[54H] [4FH] [53H] [48H] [49H] [42H] [41H] [20H] [54H] [45H] [43H] [20H] [42H] [54H] [00H] [00H]  
T O S H I B A ' T E C ' B T  
[00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H]

\* When the Bluetooth device name is less than 32 bytes, the remaining bytes are filled with 00H.

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth or Wireless LAN is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |

| Bluetooth device name |
|-----------------------|
| 32 bytes              |

## 7.12 COMMANDS RELATED TO MACRO SETTING

### 7.12.1 MACRO DEFINITION COMMAND

[GS] :

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Defines the print position and the items to be printed at the fixed position.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Format      | [GS] : aaaaa####bbbbbbbbbb#####cccccc [GS] :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Term        | aaaaa, bbbbbbbbb, ccccc: Fixed data<br>#####: Variable data (The character codes are specified by the Macro Execute Command.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Explanation | <ol style="list-style-type: none"><li>(1) The macro definition can be made by entering the character code or [LF] (Print Line Feed Command) between “[GS]:” and “[GS]:.”</li><li>(2) From the start to end of the macro definition, must be a maximum of 253 bytes.</li><li>(3) The macro definition data is kept until the power is turned off.</li><li>(4) The number of digits indicated using “#” must match that for the macro to be actually executed.</li><li>(5) Character code designated by the Macro Definition Command is sent to the printer for printing it on the receipt. Use of the macro function reduces the number of data transmissions by the standard format and transmission time, and increases the number of printable lines at one transmission.</li></ol> |

7.12.2 MACRO EXECUTE COMMAND

[GS] ^ <Data> [NUL]

**Function** Stores data for items for which the macro definitions are made.

**Format** [GS] ^ aaaaabbbbbccccc [NUL]

**Term**  
aaaaa: 1st data to be printed  
bbbbbb: 2nd data to be printed  
ccccc: 3rd data to be printed

**Explanation**

- (1) If this command is sent without making a macro definition by the Macro Definition Command, a syntax error occurs.
- (2) The receipt is printed by transferring the character code specified by the Macro Definition Command. The No. of times of data transfer and transfer time for printing in a fixed format, can be saved. Also, the printable No. of lines per batch transfer can be increased by using the macro function.

[Ex.] [GS] ^ 0023071T1 A Label 1 ¥9,000 [NUL]

```
[GS] : NO.### (####) [LF]
 ##### [LF]
 Quantity ##### [LF]
 Price ##### [LF]
 ----- [LF] [GS] :
```

The print position and items to be printed at the fixed position are defined by making a macro definition.



```
NO.### (####)
#####
Quantity #####
Price #####
```

To print data on two or more lines, only the variable data specified by "#", is sent using the Macro Execute Command.

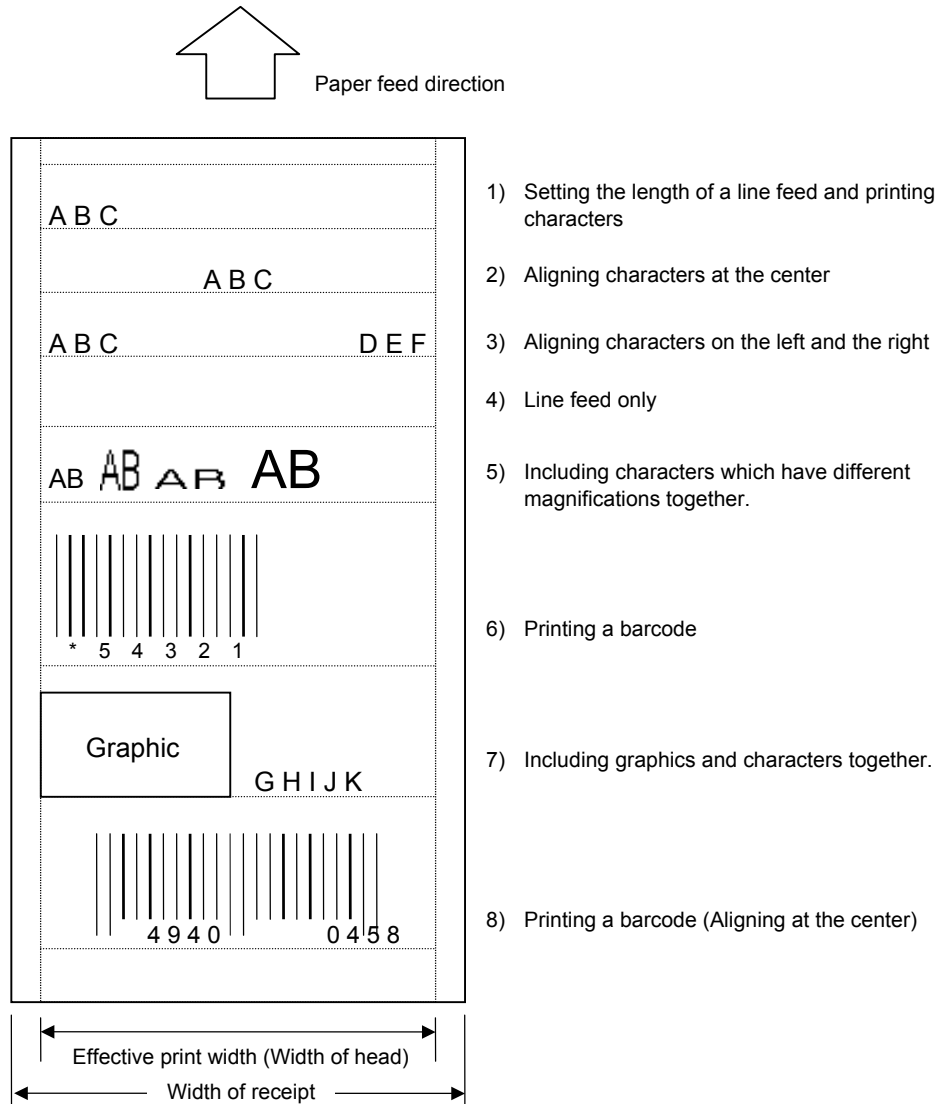


[GS]^0023071T1 A Label 1 ¥9,000 [NUL]

```
NO.002 (3071)
T1 A Label
Quantity 1
Price ¥9,000
```

## 7.13 EXAMPLES

### 7.13.1 EXAMPLES OF USING COMMANDS



[Examples of transmitted data]

|    | Command/Print data                                                                 | Result                                                                                                                                                                                                                                         |
|----|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) | [ESC] 3 [20H]<br>ABC [LF]                                                          | Setting the length of a line feed (32 dots)<br>Printing characters and a line feed                                                                                                                                                             |
| 2) | [ESC] a1ABC [LF]                                                                   | Alignment of the print position (Center) + Printing and a line feed                                                                                                                                                                            |
| 3) | [ESC] a0ABC<br>[ESC] a2DEF [LF]                                                    | Alignment of the print position (Left)<br>Alignment of the print position (Right) + Printing and a line feed                                                                                                                                   |
| 4) | [LF]                                                                               | Line feed                                                                                                                                                                                                                                      |
| 5) | [ESC] a0<br>AB<br>[ESC] ! [10H] AB<br>[ESC] ! [20H] AB<br>[ESC] ! [30H] AB<br>[LF] | Alignment of the print position (Left)<br>Printing characters (1x1 magnification)<br>Printing characters (1x2 magnification)<br>Printing characters (2x1 magnification)<br>Printing characters (2x2 magnification)<br>Printing and a line feed |

[Examples of transmitted data] (Continued)

|    |                                                          |                                                                                                                                      |
|----|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 6) | [GS] k3*54321* [NUL]<br>[LF]                             | Printing CODE39<br>Printing and a line feed                                                                                          |
| 7) | [GS]/1<br>[ESC] ! [00H] GHIJK [LF]                       | Printing a graphic<br>Printing characters (1x1 magnification) + printing and a line feed                                             |
| 8) | [ESC] a1<br>[GS] h [50H]<br>[GS] k04940045 [NUL]<br>[LF] | Alignment of the print position (Center)<br>Setting the height of the barcode (80 dots)<br>Printing EAN8<br>Printing and a line feed |

## 8. ESC/POS MODE (INTERFACE COMMAND)

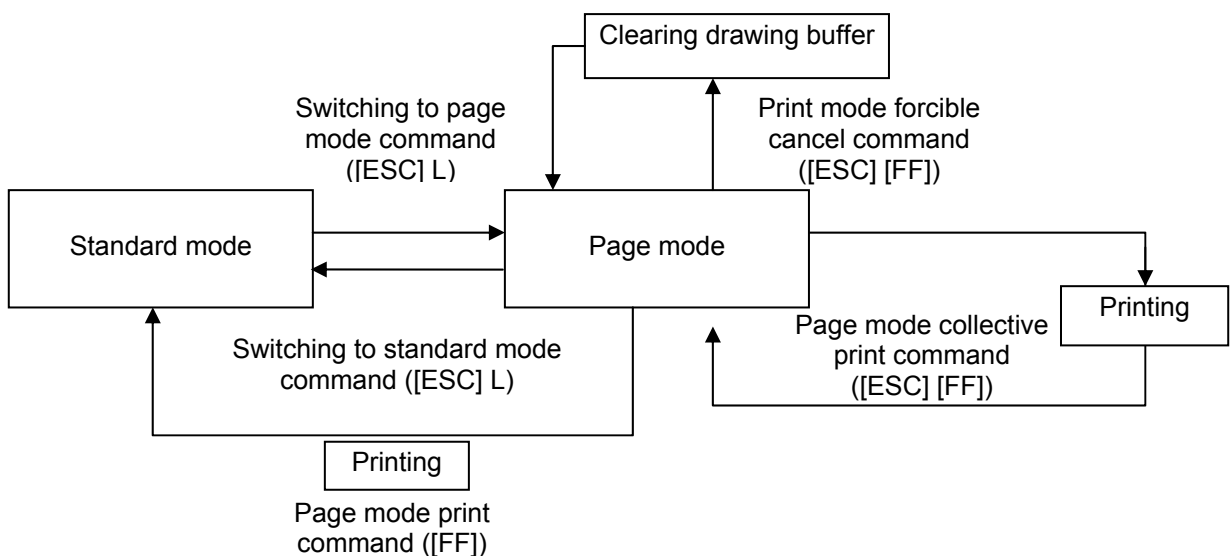
### 8.1 GENERAL DESCRIPTION

This printer has 2 modes: standard mode and page mode.

In standard mode, the printer performs a print job or feeds paper every time a print or feed command is received. In page mode, however, all received print or feed commands are just expanded in the print area on the memory and the printer does not operate. Once the Page Mode Collective Print Command ([ESC] [FF]) or Page Mode Print Command ([FF]) is executed, the printer prints all data expanded in the print area in a collective manner.

For instance, if printing and feeding of data "ABCDEFGH" [LF] is performed, "ABCDEFGH" will be printed, and a new line will be started in standard mode. In page mode, "ABCDEFGH" will be written into the specified print area on the memory, and the memory position to write subsequent print data will be shifted 1 line.

The printer is placed in page mode upon the receipt of the Switching to Page Mode Command ([ESC]L). Any commands received subsequently are processed for page mode. Executing the Page Mode Collective Print Command ([ESC] [FF]) allows all received data to be printed in a collective manner. In addition, executing the Page Mode Print Command ([FF]) allows all received data to be printed in a collective manner, and returns the printer to standard mode. Executing the Switching to Standard Mode Command ([ESC] S) returns the printer to standard mode without printing the print data for page mode. Note that the print data is cleared.



Either of the language types, Kanji, Chinese and Korean, can be implemented. Any font other than the on-board fonts is selectable.



## 8.2 OUTLINE OF COMMANDS

### 8.2.1 FORMAT OF INTERFACE COMMAND

|     |         |
|-----|---------|
| ESC | Command |
| GS  | Command |
| FS  | Command |
| HT  |         |
| LF  |         |
| FF  |         |
| CAN |         |

Control codes are as listed below:

- ESC (1BH)
- GS (1DH)
- FS (1CH)
- HT (09H)
- LF (0AH)
- FF (0CH)
- CAN (18H)

### 8.2.2 HOW TO USE REFERENCE

**Function** Describes the outline of the function of the command.

**Format** Shows the format of the command.

The format designation method should conform to the following rules:

- n refers to a parameter item.
- Brackets and parentheses (e.g. [ ] or < >) are used only for description, and must not be transmitted in practice.
- Other symbols must always be inserted at designated positions before being transmitted.

**Term** Explains the term(s) used in the format.

**Default value** Default value of a parameter (at power-on or switching to ESC/POS mode)

**Explanation** Explains the command in detail.

**Refer to** Related commands

### 8.2.3 PRECAUTIONS

Print density fine adjustment cannot be selected in the ESC/POS mode. The mode must be switched to the TPCL, LABEL or RECEIPT1 mode once, to select print density fine adjustment.

### 8.3 FONT SPECIFICATIONS

Font type: Alphanumeric characters: 95

Extended graphics: 128 characters × 4

Chinese characters: JIS 1 level 2

|                 |       |                                       |
|-----------------|-------|---------------------------------------|
| Font structure: | ANK   | Chinese character, Chinese, or Korean |
| Font A          | 12×24 | 24×24                                 |

### 8.4 EXTERNAL (CUSTOM) CHARACTERS SPECIFICATIONS

- ANK

Font A 95 characters (20h to 7Eh)

- Chinese characters

\* 7721h to 777Eh for JIS, EC40h to EC9Eh (except for EC7Fh) for shift JIS, and F7A1h to F7Feh for the EUC code

- Chinese

FF40h to FF7Eh, FF80h to FFFCh

- Korean

FF40h to FF7Eh, FF80h to FFFCh

\* The specified writable characters are not backed up. (They apply until the printer is turned off.)

### 8.5 INPUT DATA BUFFER

Input data buffer (receive buffer) size: 512 Kbytes

## 8.6 VALUE SPECIFIED BY EACH COMMAND

The values specified by each command are commonly applied in standard and page modes. However, as for the following commands, values must be independently specified and maintained in standard and page modes.

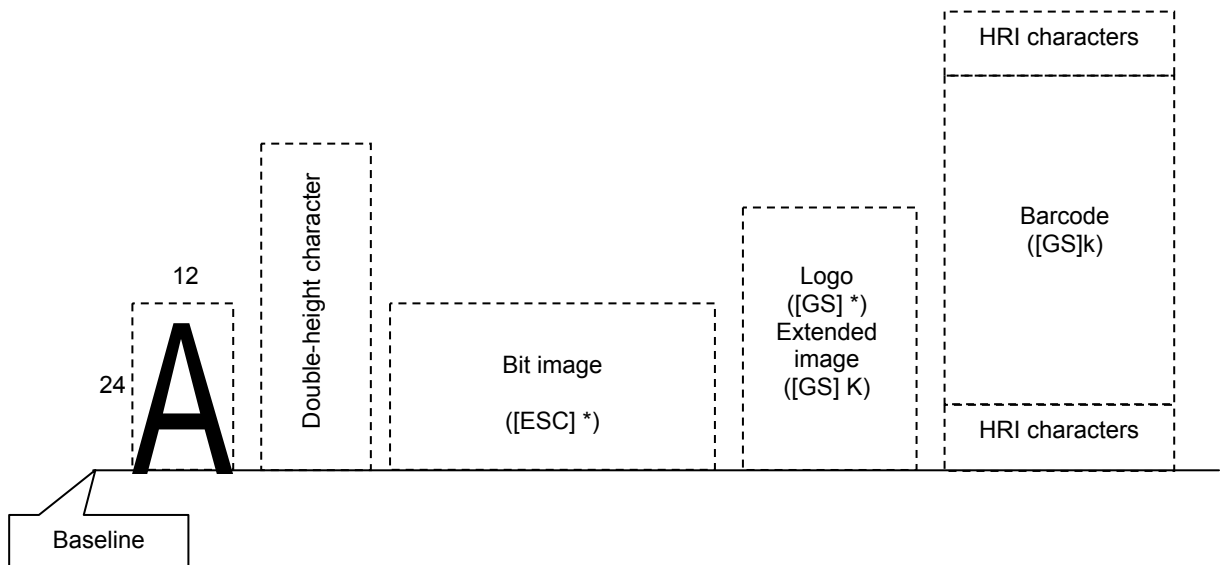
- [ESC] [SP]: Setting of spacing on the right of a character
- [ESC] 2 : Setting of 30-dot feeding
- [ESC] 3 : Setting of minimum dots for line feed
- [FS] S : Setting of spacing on both sides of a chinese character

## 8.7 EXPANSION OF PRINT DATA IN PRINT AREA

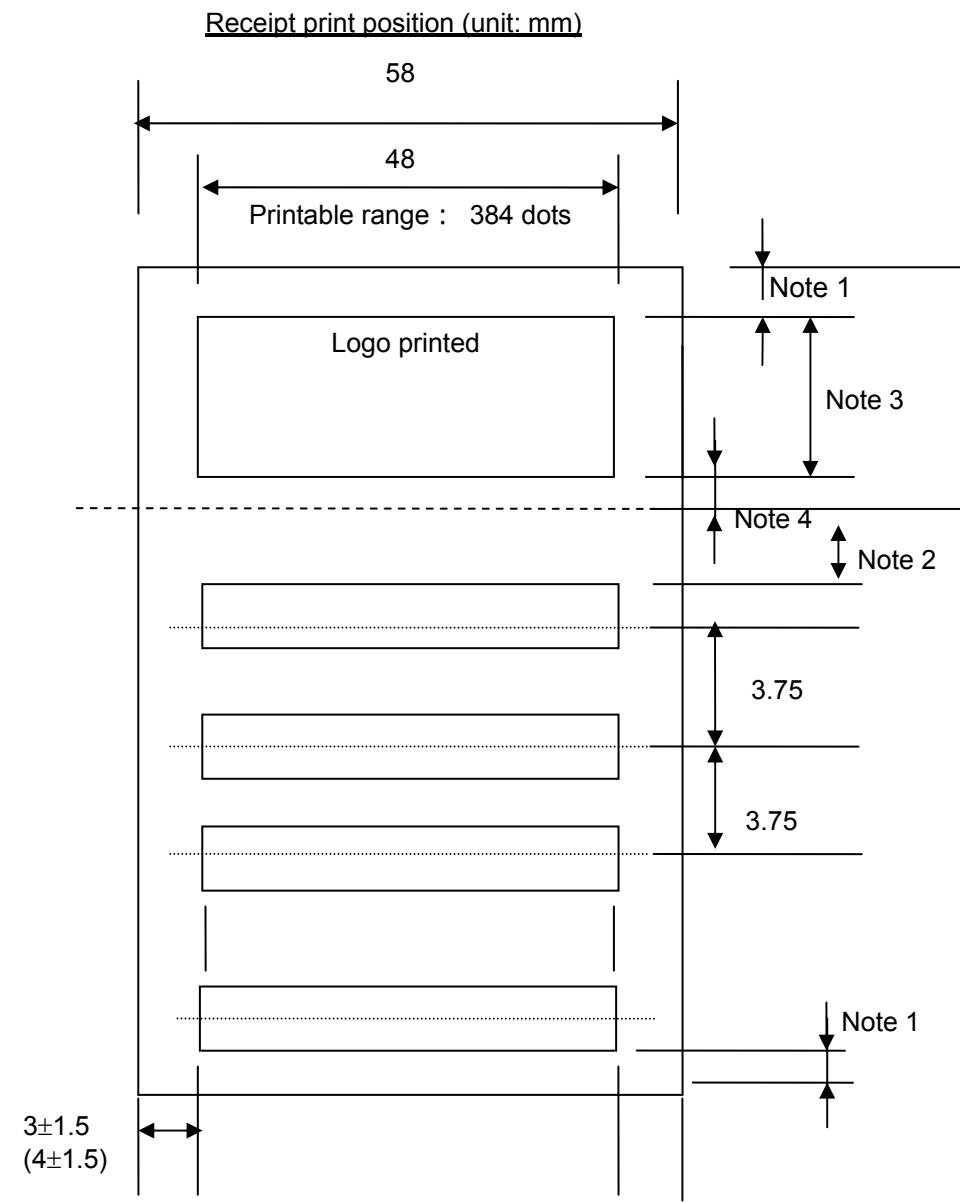
The print data is expanded in the print area as follows.

- (1) The print area is defined by the Page Mode Print Area Set command ([ESC] W). The left end of the printer as one face must be considered as the starting point of the print area (x0,y0) at the moment when printing or feeding before the printer receives [ESC] W is completed. The print area is formed by a rectangle that is dx pitches wide (from the starting point in the x or horizontal direction) and dy pitches high (from the starting point in the y or vertical direction). (If the print area is not defined by [ESC] W, a default value will be applied.)
- (2) If the printer receives print data after the print area is defined by the Page Mode Print Area Set command ([ESC] W) and the print direction is defined by the Page Mode Print Direction Set Command ([ESC] T), characters and downloaded bit images are expanded aligning their bottom left point to the baseline.
- (3) If the print data (including space on the right of a character) deviates from the print area before a command that includes line feed (Line Feed Command ([LF]) or Feed Length Set Command ([ESC] J) is received, line feed will be performed automatically within the print area. The position where print data is expanded is shifted 1 line. Also, the next expansion position is the beginning of the line. Line feed must be performed in accordance with the line feed length specified by the 30-dot Line Feed Length Set Command ([ESC] 2) or Minimum Dots for Line Feed Length Set Command ([ESC] 3).
- (4) The default line feed length is 30 dots. Therefore, if the print data for the next line includes double-height characters or downloaded bit image, the default line feed length may be insufficient. As a result, the higher order dots may be superimposed on the previous print data. Therefore, the line feed length must be increased.
- (5) Printing of a barcode in horizontal orientation is not allowed due to a large reading error.

[Position where print data is expanded]



## 8.8 EXAMPLE OF RECEIPT PRINTER PRINT LAYOUT (B-EP2DL)



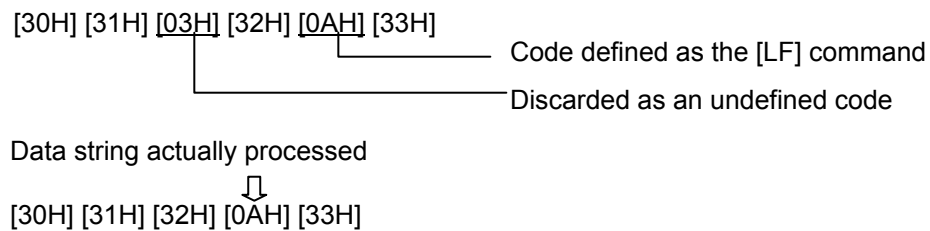
- Note 1) A minimum margin of 2 mm must be reserved at the top and bottom of a receipt.
- Note 2) If printing starts from a stand-by position (or motor stop position) after a logo is printed, a blank must be inserted for a minimum of 24 pulses (3.0 mm) (or 48 pulses (6.0 mm) or over recommended). (This is because of reserving a slow-up area. The number of slow-up pulses varies depending on the print speed.)
- Note 3) A logo must be printed within the range of 21 mm at maximum.
- Note 4) After a logo is printed, a blank must be inserted for a minimum of 24 pulses (3.0 mm) (or 48 pulses (6.0 mm) recommended).

## 8.9 EXCEPTION HANDLING

### 8.9.1 UNDEFINED CODE

This applies to the codes that fall in the range between 00h and 1Fh in the character code table. If a code that is not defined in the range is inputted as a command, 1 byte must be discarded, and the subsequent data must be processed as normal data.

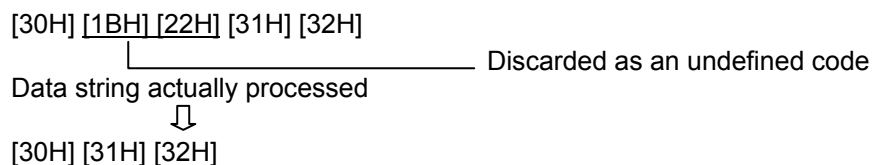
<Ex.> Data string [30H][31H][03H][32H][0AH][33H] is inputted.



### 8.9.2 UNDEFINED COMMAND

If a code following the [ESC] (1Bh), [FS] (1Ch), or [GS] (1Dh) is not defined as a command, [ESC], [FS], or [GS] and the following code (2 bytes in total) must be discarded.

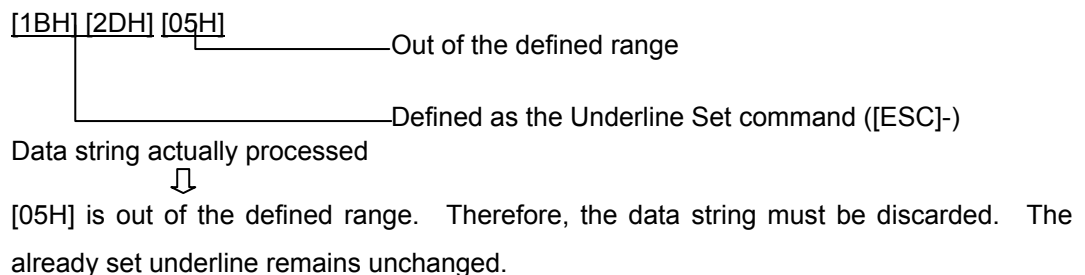
<Ex.> Data string [30H][1BH][22H][31H][32H] is inputted.



### 8.9.3 SETTING OUT OF DEFINED RANGE

If a numeric value outside the defined range is inputted, the command must be ignored, and an already set value must not be changed. For commands that have multiple arguments, once a numeric value out of the defined range is inputted, command processing is aborted, and the subsequent data is processed as normal data.

<Ex.> Data string [1BH][2DH][05H] is inputted.



## 8.10 ESC/POS COMMANDS

### 8.10.1 HORIZONTAL TAB COMMAND

[HT]

|             |                                                                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Moves a print position to the next horizontal tab position.                                                                                                                                              |
| Format      | ASCII: HT<br>Hex: 09h                                                                                                                                                                                    |
| Default     | Every 8 characters of font A (9th, 17th digit...)                                                                                                                                                        |
| Explanation | (1) This command will be ignored if the next horizontal tab position is not specified.<br>(2) The Horizontal Tab Positions Set Command ([ESD] D) must be used to specify a position of a horizontal tab. |

[Program example]

```
fprintf(stdprn, "01234567890123456789012345678901234\n");
 for(i=0; i<4; i++) {
 fputc('\t', stdprn); /* Horizontal tab */
 fputc('H', stdprn);
 }
fputc('\n', stdprn);
```

[Print example]: Default horizontal tab position

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4
 H H H H
```

|           |                                               |
|-----------|-----------------------------------------------|
| Reference | Horizontal Tab Positions Set Command ([ESD]D) |
|-----------|-----------------------------------------------|

### 8.10.2 LINE FEED COMMAND

[LF]

**Function** Prints data and inserts a line feed.

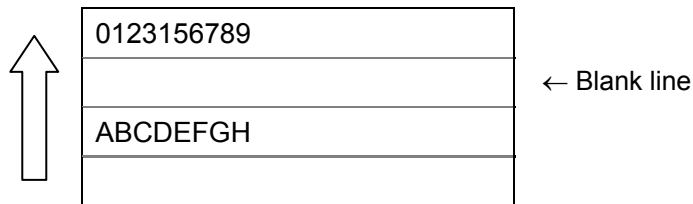
**Format** ASCII: LF  
Hex: 0Ah

- Explanation**
- (1) If print data is received with the specified number of digits per line exceeded and no line feed ([LF]), it will be printed with a line feed inserted automatically.
  - (2) If this command is received without print data, a line feed of a specified length will be just inserted.
  - (3) Data that contains 4,096 bytes in a single line (up to [LF]) must not be transmitted. If the number of bytes exceeds 4,096, the correct functioning of the printer will not be guaranteed.

[Program example]

```
fprintf(stdprn, "0123456789\n");
fputc('\n', stdprn); /* Line feed */
fprintf(stdprn, "ABCDEFGH\n");
```

[Print example]



**Reference** 30-dot Line Feed Length Set Command ([ESC] 2)

Minimum Dots for Line Feed Length Set Command ([ESC] 3)



### 8.10.3 PAGE MODE PRINT COMMAND

[FF]

|             |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Prints the data expanded in the print area in page mode, and returns the printer to standard mode.                                                                                                                                                                                                                                                                                                                 |
| Format      | ASCII: FF<br>Hex: 0Ch                                                                                                                                                                                                                                                                                                                                                                                              |
| Explanation | <ol style="list-style-type: none"><li>(1) This command is ignored except when page mode is selected.</li><li>(2) The data that has been drawn is all erased after printing is completed.</li><li>(3) The print area specified by the Page Mode Print Area Set Command ([ESC] W) is initialized.</li><li>(4) After this command is executed, the next print starting position is the beginning of a line.</li></ol> |
| Reference   | Page Mode Collective Print Command ([ESC] [FF])<br>Switching to Page Mode Command ([ESC] L)<br>Switching to Standard Mode Command ([ESC] S)                                                                                                                                                                                                                                                                        |

#### 8.10.4 PAGE MODE CANCEL COMMAND

**[CAN]**

|             |                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Clears all data in the currently specified print area for page mode.                                                                                                                                                                                                                                                                                                                          |
| Format      | ASCII: CAN<br>Hex: 18h                                                                                                                                                                                                                                                                                                                                                                        |
| Explanation | (1) This command is ignored except when page mode is selected.<br><br>(2) The data contained in the currently specified print area will be cleared even if it is the data contained in the previously specified print area. The print starting position in the currently specified print area is returned to the starting position defined by the Page Mode Print Area Set Command ([ESC] W). |
| Reference   | Switching to Page Mode Command ([ESC] L)<br>Page Mode Print Area Set Command ([ESC] W)                                                                                                                                                                                                                                                                                                        |

**8.10.5 PAGE MODE COLLECTIVE PRINT COMMAND [ESC] [FF]**

|             |                                                                                                                                                                                                                                                                                                   |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Prints the data expanded in the print area in page mode altogether.                                                                                                                                                                                                                               |
| Format      | ASCII: ESC FF<br>Hex: 1Bh 0Ch                                                                                                                                                                                                                                                                     |
| Explanation | (1) This command is ignored except when page mode is selected.<br>(2) The values specified by the Page Mode Print Direction Set Command ([ESC] T) or the Page Mode Print Area Set Command ([ESC] W) and the position where the print data is expanded are maintained after printing is completed. |
| Reference   | Page Mode Print Command ([FF])<br>Switching to Page Mode Command ([ESC] L)<br>Switching to Standard Mode Command ([ESC] S)                                                                                                                                                                        |

**8.10.6 SPACING SET COMMAND**

**[ESC] [SP]**

**Function** Specifies spacing (or the number of dots) on the right of an ANK character.

**Format** [ESC] SPn

**Term** ASCII: ESC SP n  
Hex: 1Bh 20h n

[Parameter]

n: Spacing (or the number of dots) on the right  $0 \leq n \leq 99$  ( $00h \leq n \leq 63h$ )

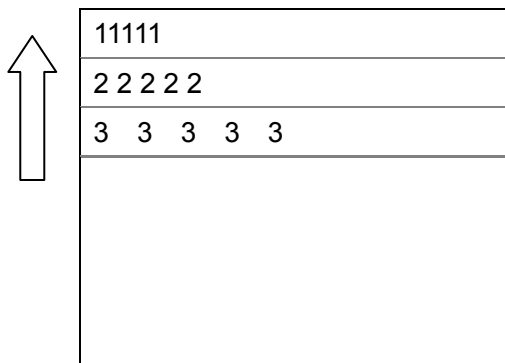
**Default value** n : 1

- Explanation**
- (1) For a double-width character, spacing will also be doubled.
  - (2) The maximum permissible spacing on the right of a character is 99 dots. If a specified value exceeds 99, the maximum value of 99 will be applied.
  - (3) Spacing can be independently specified in standard and page modes.
  - (4) The value specified by this command is not applicable to Chinese characters. Instead, the Chinese Character Spacing Set Command ([FS] S) must be applied.

[Program example]

```
fprintf(stdprn, "\033 "); /* 1 dot on the right */
fputc(1, stdprn);
fprintf(stdprn, "11111\n");
fprintf(stdprn, "\033 %c", 13); /* 13 dots on the right */
fprintf(stdprn, "22222\n");
fprintf(stdprn, "\033 %c", 26); /* 26 dots on the right */
fprintf(stdprn, "33333\n");
```

[Print example]



**8.10.7 PRINT MODE ALL SET COMMAND**

**[ESC] !**

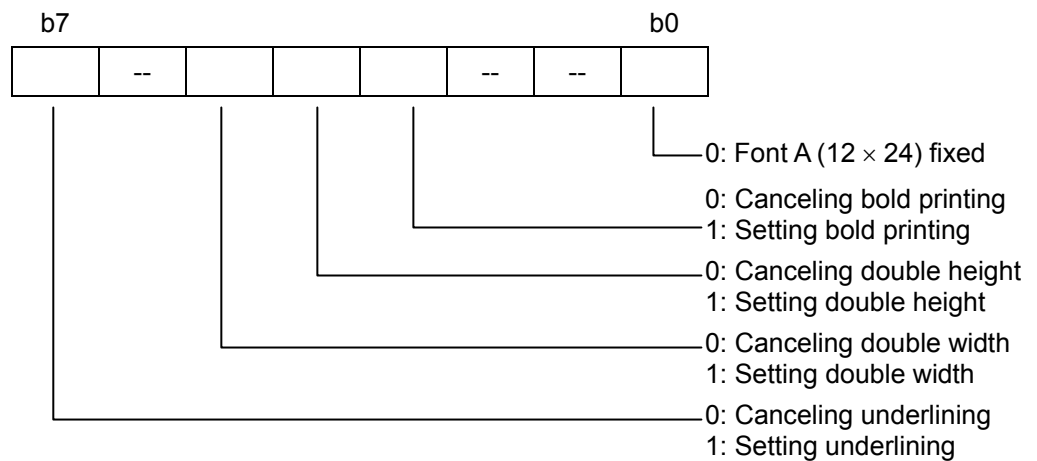
**Function** Performs character control (specifies print modes altogether).

**Format** [ESC] !n

**Term** ASCII: ESC ! n  
Hex: 1Bh 21h n

[Parameter]

n: Specifying print mode  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



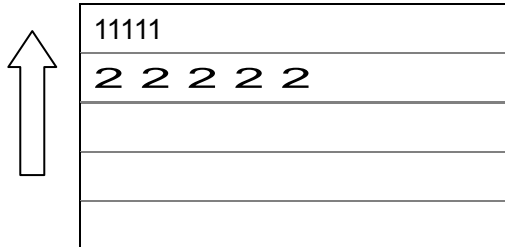
**Default value** n : 0

- Explanation**
- (1) With underlining set, a portion skipped by HT or a character rotated 90 degrees clockwise will not be underlined.
  - (2) An underline is 1 dot thick. However, the thickness of an underline is determined in accordance with the thickness specified by the Underlining Set Command ([ESC]-).
  - (3) Bold printing can also be set or canceled by the Bold Printing Set Command ([ESC]E), but the most recently processed command is applied.
  - (4) An ANK character size can also be specified by the Character Size Set Command ([GS]!), but the most recently processed command is applied.
  - (5) Underlining can also be set or canceled by the Underlining Set Command ([ESC]-), but the most recently processed command is applied.
  - (6) If both double height and double width are set at the same time, a character size will be quadrupled (double height × double width).

[Program example]

```
fprintf(stdprn, "\033! "); /* Normal width */
fputc(0, stdprn);
fprintf(stdprn, "11111\n");
fprintf(stdprn, "\033 %c", 0 × 20); /* Double width */
fprintf(stdprn, "22222\n");
```

[Print example]



Reference

- Underlining Set Command ([ESC] -)
- Bold Printing Set Command ([ESC] E)
- Character Size Set Command ([GS] !)

**8.10.8 DOWNLOADED CHARACTER (WRITABLE CHARACTER) SET COMMAND [ESC] %**

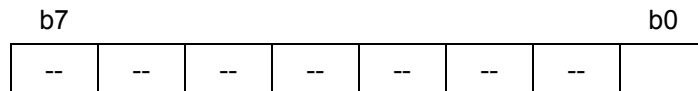
**Function** Sets or cancels downloaded characters (writable characters).

**Format** [ESC] %n

**Term** ASCII: ESC % n  
Hex: 1Bh 25h n

[Parameter]

n: Setting / canceling downloaded character  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



└ 0: Canceling downloaded characters  
1: Setting downloaded characters

**Default value** n: 0

**Explanation**

- (1) n is valid only in the least significant bit.
- (2) If downloaded characters (writable characters) are not registered with a specified code, the internal ANK characters will be printed. Also, when the downloaded characters (writable characters) are canceled, the internal ANK characters will be selected automatically for printing.

**Reference** Downloaded Character (Writable Character) Define Command ([ESC] &)  
Downloaded Character Erase Command ([ESC] ?)

### 8.10.9 DOWNLOADED CHARACTER (WRITABLE CHARACTER) DEFINE COMMAND [ESC] &

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Defines downloaded characters (writable characters) of the ANK code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Format        | [ESC] &ynm [xd <sub>1</sub> d <sub>2</sub> d <sub>3</sub> ...d <sub>yx</sub> ] <sub>n</sub> .....[xd <sub>1</sub> d <sub>2</sub> d <sub>3</sub> ...d <sub>yx</sub> ] <sub>m</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Term          | <p>ASCII: ESC &amp;<br/>Hex: 1Bh 26h</p> <p>[Parameter]<br/> y: No. of bytes in the vertical direction      3 (03h) Fixed<br/> n: Setting start character code                32 ≤ n ≤ 126 (20h ≤ n ≤ 7Eh)<br/> m: Setting end character code                 32 ≤ m ≤ 126 (20h ≤ m ≤ 7Eh)<br/> * n = m if there is only 1 character.<br/> d: Data to be defined                            00h ≤ d<sub>1</sub>, d<sub>2</sub>, ... d<sub>yx</sub> ≤ FFh<br/> x: No. of bytes in the horizontal direction   0 ≤ x ≤ 12 (00h ≤ x ≤ 0Ch)</p>                                                                                                                                                                                                                                                                                                                                                                                            |
| Default value | Internal ANK characters (no writable characters registered)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Explanation   | <ol style="list-style-type: none"> <li>(1) Multiple consecutive character codes can be defined in the single execution of this command.</li> <li>(2) d refers to not only data to be defined, but also a pattern of dots from the left end in the x (horizontal) direction. If x is below the number of dots to form a character, the remaining dots on the right will be space filled.</li> <li>(3) At a moment when an error occurs with parameter y, n, m, or x due to a factor such as an unmatched condition, command processing will be aborted, and the data subsequent to x will be processed as normal data.</li> <li>(4) The defined downloaded characters are cleared in the event of the following commands: <ul style="list-style-type: none"> <li>• Initialize Command ([ESC] @)</li> <li>• Downloaded Bit image Define Command ([GS] *)</li> <li>• Downloaded Character Erase Command ([ESC] ?)</li> </ul> </li> </ol> |
| Reference     | [ESC] %, [ESC] ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



[Program example]

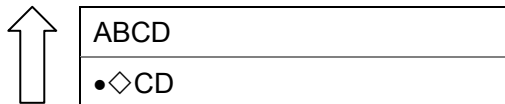
```

/* Data for registration of writable characters */
unsigned char gaiji1[3] = { 0x10, 0x00, 0x00 };
unsigned char gaiji2[15] = { 0x10, 0x00, 0x00, 0x28, 0x00, 0x00, 0x44, 0x00, 0x00,
 0x28, 0x00, 0x00, 0x10, 0x00, 0x00 };

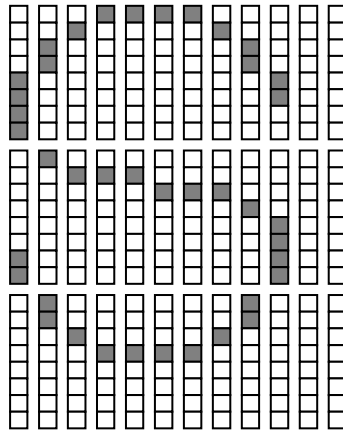
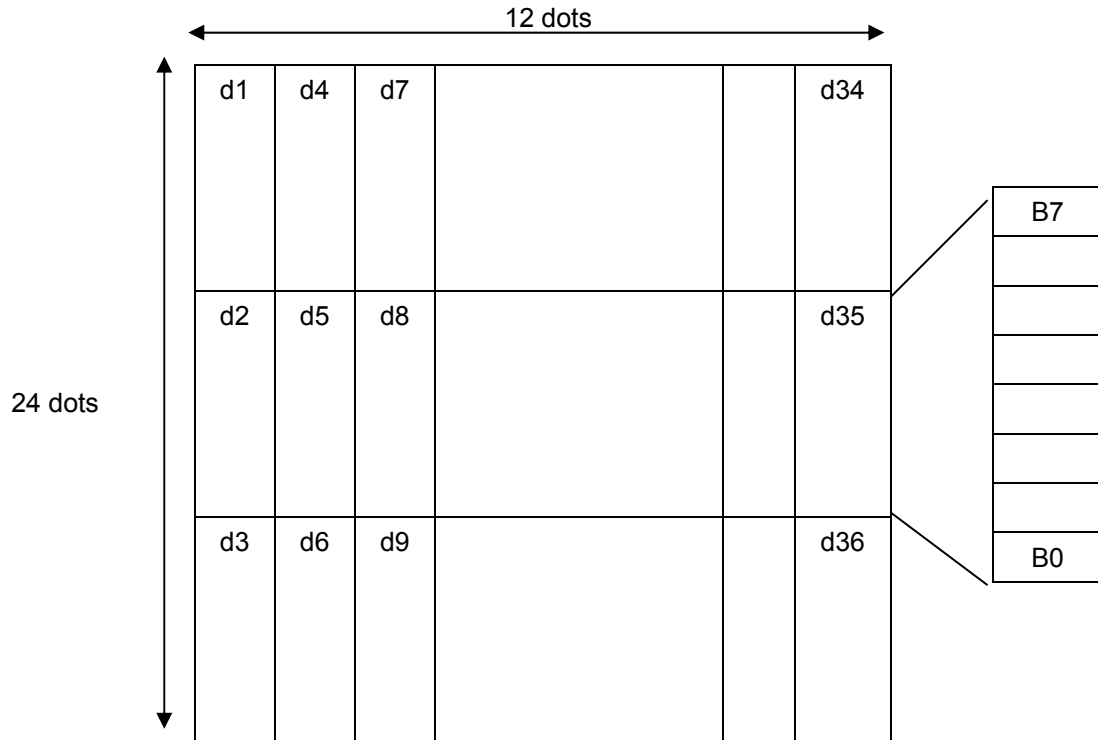
fprintf(stdprn, "\033&\003AB"); /* Registration of writable characters 41H,42H code */
putc(1, stdprn); /* 1 dot in the horizontal direction */
for(i=0;i<3;i++)
 fputc(gaiji1[i], stdprn);
putc(5, stdprn); /* 5 dots in the horizontal direction */
for(i=0;i<15;i++)
 fputc(gaiji2[i], stdprn);
fprintf(stdprn, "\033%%"); /* Canceling writable characters */
putc(0, stdprn);
fprintf(stdprn, "ABCD\n");
fprintf(stdprn, "\033%%"); /* Setting writable characters */
putc(1, stdprn);
fprintf(stdprn, "ABCD\n");

```

[Print example]



[Specified character] Example of font A



d1 = 0 × 0F    d4 = 0 × 30    d7 = 0 × 40 ...  
d2 = 0 × 03    d5 = 0 × 80    d8 = 0 × 40 ...  
d3 = 0 × 00    d6 = 0 × C0    d9 = 0 × 20 ...

**8.10.10 BIT IMAGE MODE SELECT COMMAND**

**[ESC] \***

**Function** Selects bit image mode (or prints image data).

**Format** [ESC] \*mnLnH (d1d2...d<sub>((n1 + 256 × n2) × k)</sub>)

**Term** ASCII: ESC \*  
Hex: 1Bh 2Ah

**[Parameter]**

m: Mode m = 0, 1, 32, 33 (m = 00h, 01h, 20h, 21h)  
nL: No. of bytes in the horizontal direction (low order)  $0 \leq nL \leq 255$  (00h ≤ nL ≤ FFh)  
nH: No. of bytes in the horizontal direction (high order)  $0 \leq nH \leq 3$  (00h ≤ nH ≤ 03h)  
d: Image data 00h ≤ d<sub>1</sub>, d<sub>2</sub>, ... d<sub>yx</sub> ≤ FFh  
k: No. of bytes in the vertical direction k = 1 if m = 0 or 1 (m = 00h k = 01h)  
k = 3 if m = 32 or 33 (m = 20h, k = 21h)

**Explanation** (1) Image data m is specified by the number of dots defined by nL, nH and k.

(2) The number of dots in the horizontal direction is determined by nL + 256 × nH.

(3) If the number of dots in the horizontal direction (nL + 256 × nH) exceeds the value listed in the table below, printing will be performed while wrapping around, and consequently corrupted.

|                        |        |
|------------------------|--------|
| B-EP2DL-GHxx (203 dpi) | 384 mm |
| B-EP4DL-GHxx (203 dpi) | 832 mm |

(4) d refers to image data. A bit to be printed is set to 1, and the one not to be printed is set to 0.

(5) The table below shows mode selected by m.

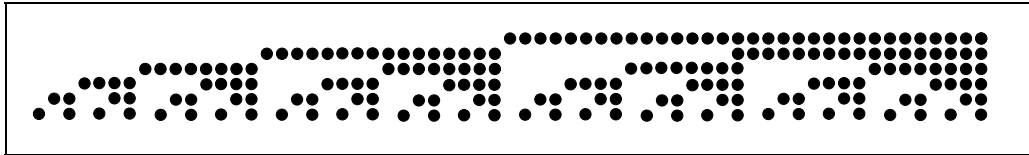
| m (mode) | No. of dots in the vertical direction | Dot density    |
|----------|---------------------------------------|----------------|
| 0        | 8                                     | Single density |
| 1        | 8                                     | Double density |
| 32       | 24                                    | Single density |
| 33       | 24                                    | Double density |

(6) Underlining, bold printing, reverse printing (white on black background), or inverted printing (upside-down) is not applicable to this image data.

(7) A bit image in page mode is valid only when 0 (0-degree rotation) is specified by the Page Mode Print Direction Set Command ([ESC] T). If anything other than 0 degree is selected, the bit image will not be rotated.

(8) At a moment when an error occurs with parameter m, nL, or nH due to a factor such as an unmatched condition, command processing will be aborted, and the subsequent data subsequent to x will be processed as normal data.

(9) The most significant bit is printed on top, and the least significant at the bottom.



[Program example]

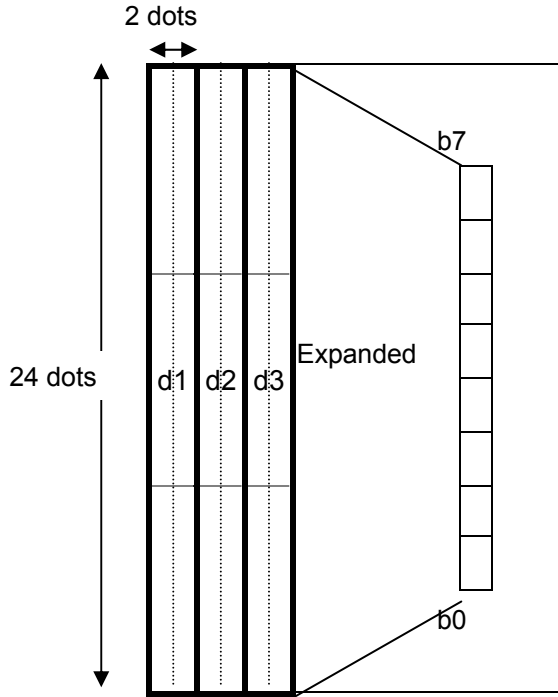
```
for(m=0;m<1;m++) {
 fprintf(stdprn, "\033*%c\x3F%c", m, 0);
 for(i=1;i<=0x3F;i++) {
 fputc(i, stdprn);
 }
 fputc('\n', stdprn);
}
fprintf(stdprn, "\n\r");
```

[Print example]

Single density ( $m = 0$ )

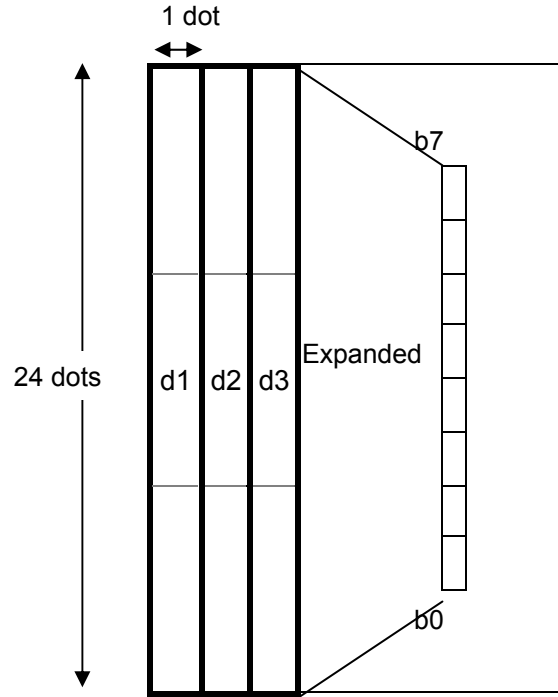
8-dot single density:

1-byte data is tripled in the vertical direction, and doubled in the horizontal direction.



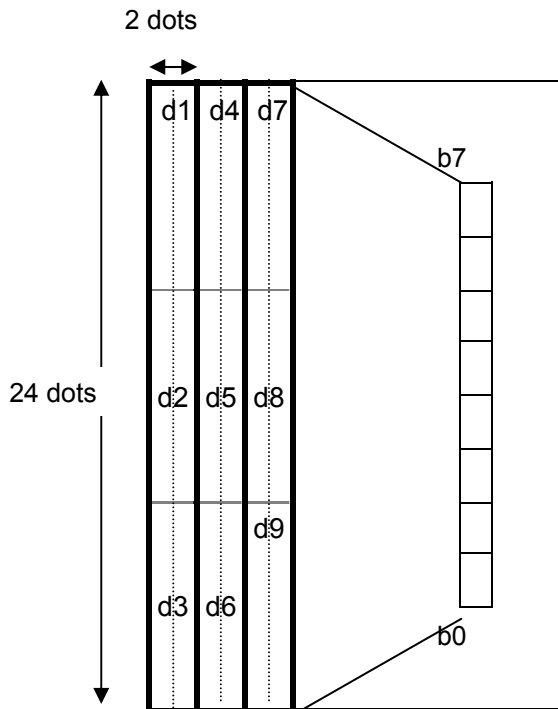
8-dot double density:

1-byte data is tripled in the vertical direction.



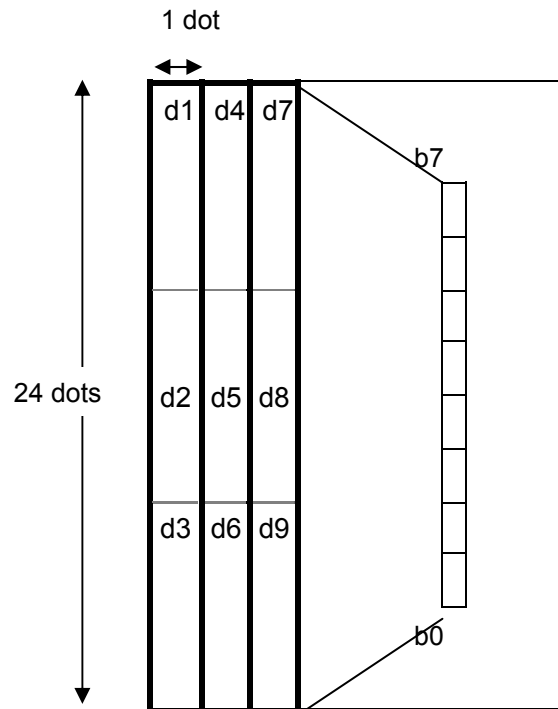
24-dot single density:

1-byte data is doubled in the horizontal direction.



24-dot double density:

1-byte data is edited in sequence.



### 8.10.11 UNDERLINING SET COMMAND

[ESC] -

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets or cancels underlining.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Format        | [ESC] -n                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Term          | ASCII: ESC -<br>Hex: 1Bh 2Dh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|               | [Parameter]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|               | n: Setting underlining                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|               | $0 \leq n \leq 2$ ( $00h \leq n \leq 02h$ )<br>or<br>$48 \leq n \leq 50$ ( $30h \leq n \leq 32h$ )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|               | 0: Canceling underlining<br>1: Setting underlining (1-dot wide)<br>2: Setting underlining (2-dot wide)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Default value | n : 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Explanation   | <p>(1) The character including the space on its right is underlined. However, a portion skipped by the Horizontal Tab Command ([HT]) is not underlined.</p> <p>(2) A character rotated 90 degrees clockwise or a character in reverse is not underlined.</p> <p>(3) If underlining is canceled with <math>n = 0</math> or <math>n = 48</math>, subsequent data will not be underlined. However, the width of the underline specified most recently is maintained. Also, a 1-dot wide underline is selected by default.</p> <p>(4) The width of the underline is consistent regardless of a character size.</p> <p>(5) Underlining can also be set or canceled by the Print Mode All Set Command ([ESC] !), but the most recently processed command is applied.</p> <p>(6) There is no impact upon Chinese Characters.</p> |
| Reference     | Print Mode All Set Command ([ESC] !)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

### 8.10.12 DOWNLOADED CHARACTER ERASE COMMAND [ESC] ?

|               |                                                                                                                                                                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Erases downloaded characters in a specified code.                                                                                                                                                                                                        |
| Format        | [ESC] ?n                                                                                                                                                                                                                                                 |
| Term          | ASCII: ESC ?<br>Hex: 1Bh 3Fh                                                                                                                                                                                                                             |
|               | [Parameter]<br>n: Erasing downloaded characters $32 \leq n \leq 126$ ( $20h \leq n \leq 7Eh$ )                                                                                                                                                           |
| Default value | n: 0                                                                                                                                                                                                                                                     |
| Explanation   | (1) n refers to a character code in which a defined pattern is erased. After downloaded characters are erased, the same pattern as the internal characters are printed.<br>(2) If a specified character code is undefined, this command will be ignored. |
| Reference     | Downloaded Character (Writable Character) Define Command ([ESC] &)<br>Downloaded Character (Writable Character) Set Command ([ESC] %)                                                                                                                    |

**8.10.13 30-DOT LINE FEED LENGTH SET COMMAND**

**[ESC] 2**

|             |                                                                                  |
|-------------|----------------------------------------------------------------------------------|
| Function    | Sets a line feed length to 30 dots.<br><br>203 dpi: 0.125 mm/dot                 |
| Format      | ASCII: ESC 2<br>Hex: 1Bh 32h                                                     |
| Explanation | (1) Line feed lengths can be independently specified in standard and page modes. |
| Reference   | Minimum Dots for Line Feed Length Set Command ([ESC] 3)                          |



### 8.10.14 MINIMUM DOTS FOR LINE FEED LENGTH SET COMMAND [ESC] 3

|               |                                                                                                                                                                                                                                                                                                                                                                              |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets a line feed length to $n/2$ dot.<br>Specifies the minimum number of dots for line feed.                                                                                                                                                                                                                                                                                 |
| Format        | [ESC] 3n                                                                                                                                                                                                                                                                                                                                                                     |
| Term          | ASCII: ESC 3<br>Hex: 1Bh 33h<br><br>[Parameter]<br>n: Line feed length ( $n/2$ dot) $0 \leq n \leq 255$ ( $00h \leq n \leq FFh$ )                                                                                                                                                                                                                                            |
| Default value | n: 60 (Line feed length of 30 dots)                                                                                                                                                                                                                                                                                                                                          |
| Explanation   | (1) Line feed lengths can be independently specified in standard and page modes.<br>(2) Fractions are rounded up.<br>(3) The minimum permissible value is 00h for a line feed length. However, a line feed length is only applicable when a value of 60 (30 dots) or over is specified. If a value less than 60 is specified, a line feed length will be changed to 30 dots. |
| Reference     | 30-dot Line Feed Length Set Command ([ESC] 2)                                                                                                                                                                                                                                                                                                                                |

**8.10.15 PRINTER SELECT/DESELECT COMMAND**

**[ESC] =**

**Function**

Selects or deselects the printer.

While the printer is deselected, received data is discarded until it is selected by this command again.

**Format**

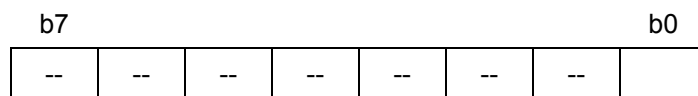
[ESC] =n

**Term**

ASCII: ESC =  
Hex: 1Bh 3Dh

[Parameter]

n: Selecting / deselecting printer       $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



└─ 0: Deselecting printer  
   1: Selecting printer

**Default value**

n: 1

**Explanation**

- (1) n is valid only in the least significant bit.
- (2) While being deselected, the printer is waiting only for this command. So please note that if the same code arrangement as [ESC] =1 (1Bh, 3Dh, 01h) is contained in the data such as writable characters or images transmitted while the printer is being deselected, the printer will be returned to the “selected” state.

### 8.10.16 INITIALIZE COMMAND

[ESC] @

|          |                                                                                   |
|----------|-----------------------------------------------------------------------------------|
| Function | Clears data in the currently expanded image buffer, and initializes the settings. |
|----------|-----------------------------------------------------------------------------------|

|        |         |
|--------|---------|
| Format | [ESC] @ |
|--------|---------|

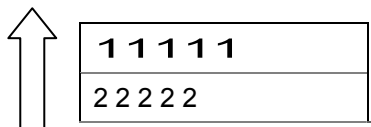
|      |                              |
|------|------------------------------|
| Term | ASCII: ESC @<br>Hex: 1Bh 40h |
|------|------------------------------|

|             |                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | (1) The data and macro definition in the receive buffer are maintained.<br>(2) Please refer to the next page for further information regarding the data to be initialized. |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

[Program example]

```
fprintf(stdprn, "\033!%c", 0x20); /* Double width */
fprintf(stdprn, "11111\n");
/*Other settings*/
fprintf(stdprn, "\033@"); /* Initializing printer */
fprintf(stdprn, "22222\n");
```

[Print example]



The diagram shows a vertical arrow pointing upwards to a rectangular box. The box is divided into two horizontal sections. The top section contains the text "1 1 1 1 1" and the bottom section contains "2 2 2 2 2". To the right of the box, there is a left-pointing arrow and the text "← All settings are reset to default values."

[Data initialized by ESC@]

| Command | Functions                                                                       | Default value                                               |
|---------|---------------------------------------------------------------------------------|-------------------------------------------------------------|
| HT      | Horizontal tab                                                                  | Every 8 characters of font A (9th, 17th digit ...)          |
| ESC SP  | Spacing on the right of character                                               | 1 dot                                                       |
| ESC !   | Character control                                                               | 0 (No settings)                                             |
| ESC %   | Setting / canceling specified characters                                        | 0 (No writable characters specified)                        |
| ESC &   | Definition of specified characters                                              | Internal ANK characters (No writable characters registered) |
| ESC -   | Setting / canceling underlining                                                 | 0 (Canceling underline)                                     |
| ESC 3   | Minimum No. of dots for line feed length                                        | 60 (Line feed length of 30 dots)                            |
| ESC =   | Selecting / deselecting printer                                                 |                                                             |
| ESC D   | Horizontal tab position                                                         |                                                             |
| ESC E   | Setting / canceling bold printing                                               | 0 (No bold printing)                                        |
| ESC G   | Setting / canceling double printing                                             | 0 (No double printing)                                      |
| ESC T   | Selecting print direction and starting point                                    | 0 (Left → right)                                            |
| ESC V   | Setting / canceling 90-degree rotation of character                             | 0 (Canceling 90-degree rotation)                            |
| ESC W   | Specifying print area                                                           | 0,0,384,384 (B-EP2DL-GHxx)<br>0,0,832,832 (B-EP4DL-GHxx)    |
| ESC a   | Specifying print position                                                       | 0 (Left justified)                                          |
| ESC c5  | Enabling / disabling panel switch                                               | 0 (Enabled)                                                 |
| ESC {   | Setting / canceling inverted printing                                           | 0 (Canceling inverted printing)                             |
| FS !    | Specifying print modes for Chinese characters altogether                        | 0 (No settings)                                             |
| FS &    | Specifying Chinese Character mode                                               | Canceled                                                    |
| FS -    | Setting / canceling underlining for Chinese characters                          | 0 (No underlining)                                          |
| FS .    | Canceling Chinese character mode                                                | 0 (Chinese character mode canceled)                         |
| FS 2    | Defining writable characters of Chinese characters                              | All space                                                   |
| FS C    | Selecting Chinese character code system                                         | 0 (JIS code system)                                         |
| FS S    | Specifying spacing on both sides of Chinese character                           | Left: 0 dot<br>Right: 2 dots                                |
| FS W    | Setting / canceling quadrupled Chinese character (double height × double width) | 0 (Canceled)                                                |
| GS B    | Setting / canceling reversed printing                                           | 0 (Reversed printing canceled)                              |
| GS a    | Setting / canceling auto status transmission                                    | 134(86h) (Status transmitted)                               |
| GS w    | Specifying width of barcode                                                     | 3 (1 module 3 dots)                                         |
| GS h    | Specifying height of barcode                                                    | 162 (20.25 mm)                                              |
| GS H    | Specifying position of HRI character of barcode                                 | 0 (No HRI printed)                                          |
| GS f    | Specifying font of HRI character of barcode                                     | 0 (HRI character = font A)                                  |
| GS W    | Specifying width of print area                                                  | 384 dots (B-EP2DL-GHxx)<br>832 dots (B-EP4DL-GHxx)          |
| GS L    | Specifying left margin                                                          | 0 (No left margin)                                          |
| GS !    | Specifying character size                                                       | 0 (Character size: × 1)                                     |

**8.10.17 HORIZONTAL TAB POSITIONS SET COMMAND [ESC] D**

**Function** Specifies the position of the horizontal tab.

**Format** [ESC] D [ $n_1n_2n_3 \dots n_k$ ] [NUL]

**Term** ASCII: ESC D  
Hex: 1Bh 44h

[Parameter]

n: Horizontal tab position (No. of digits)  $1 \leq n \leq 255$  (01h  $\leq n \leq$  FFh)

k: Maximum number of horizontal tab positions  $0 \leq k \leq 32$  (00h  $\leq k \leq$  20h)

**Default value** Every 8 characters of font A (9th, 17th, 25th digit...)

- Explanation**
- (1) The specified position of the horizontal tab is determined by [character width  $\times$  n] from the left margin or the beginning of a line. "Character width" in this context refers to the width of a character including space on its right. Therefore, if a magnification is set to x 2 or more, the character width will be enlarged accordingly.
  - (2) The position of the horizontal tab that has been specified is cleared.
  - (3) With  $n = 8$  for the position of the horizontal tab, the next print position will be shifted to the 9th digit by executing the Horizontal Tab Command ([HT]).
  - (4) The maximum permissible number of horizontal tab positions is 32 ( $k = 32$ ). If it is exceeded, the subsequent data will be processed as normal data.
  - (5) Values are inputted to  $\langle n \rangle$  for the position of the horizontal tab in ascending order, ending with (00H). If  $\langle n \rangle$  is equal to or smaller than the previous  $\langle n \rangle$ , the horizontal tab position setting will be aborted immediately, and the subsequent data will be processed as normal data.
  - (6) All horizontal tab positions are cleared by [ESC] D [NUL].
  - (7) The specified horizontal tab position will remain unchanged even if the character width is changed after the horizontal tab position is specified.

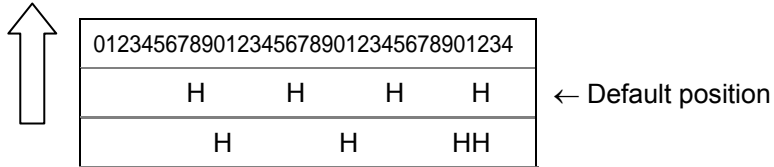
**Example** 01234567890123456789012345678901234[0A]

[09]H[09]H[09]H[09]H[0A]  
[1B]D[0A][14][1E][00[09]H[09]H[09]H[0A]

[Program example]

```
fprintf(stdprn, "01234567890123456789012345678901234\n");
fprintf(stdprn, "\033D%c%c%c", 10, 20, 30);
fputc(0, stdprn);
for(i=0;i<4;i++) {
 fputc('\t', stdprn);
 fputc('H', stdprn);
}
fputc('\n', stdprn);
```

[Print example]



**Reference** Horizontal Tab Command ([HT])

**8.10.18 BOLD PRINTING SET COMMAND**

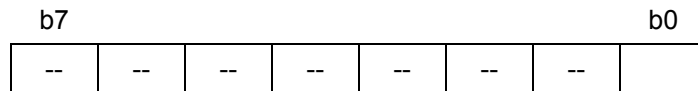
**[ESC] E**

**Function** Sets or cancels bold printing.

**Format** [ESC] En

**Term** ASCII: ESC E  
Hex: 1Bh 45h

**[Parameter]**  
n: Bold printing  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



0: Canceling bold printing  
1: Setting bold printing

**Default value** n: 0

- Explanation**
- (1) n is valid only in the least significant bit.
  - (2) In bold printing, one character is shifted 1 dot horizontally and superimposed on another. However, in the event of the Character Rotation Set Command ([ESC]V), bold printing is performed after the rotation of the character. Therefore the direction in which bold is applied is different.
  - (3) Bold printing can also be set or canceled by the Print Mode All Set Command ([ESC] G), but the most recently processed command is applied.
  - (4) The same print output is obtained as when the Double Printing Set Command ([ESC] G) is executed.

**Reference** Print Mode All Set Command ([ESC] !)

**8.10.19 DOUBLE PRINTING SET COMMAND**

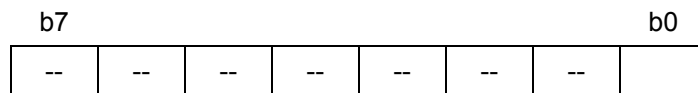
**[ESC] G**

**Function** Sets or cancels double printing.

**Format** [ESC] Gn

**Term** ASCII: ESC G  
Hex: 1Bh 47h

[Parameter]  
n: Double printing  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



└─ 0: Canceling double printing  
   1: Setting double printing

**Default value** n: 0

**Explanation** (1) n is valid only in the least significant bit.  
(2) The same print output is obtained as when the Bold Printing Set Command ([ESC]E) is executed.

**Reference** Bold Printing Set Command ([ESC] E)



### 8.10.20 FEED LENGTH SET COMMAND

[ESC] J

**Function** Prints data and feeds over the length of n/2 dots.

**Format** [ESC] Jn

**Term** ASCII: ESC J  
Hex: 1Bh 4Ah

[Parameter]  
n: Feed length  $0 \leq n \leq 255$  (00h  $\leq$  n  $\leq$  FFh)

- Explanation**
- (1) After this command is executed, the next print starting position is the beginning of a line.
  - (2) There is no impact upon the line feed length specified by the 30-dot Line Feed Length Set Command ([ESC] 2) or Minimum Dots for Line Feed Length Set Command ([ESC] 3).
  - (3) Fractions are rounded up, if any.
  - (4) In standard mode, dots in the vertical direction (y) are used.
  - (5) In page mode, the printer operation varies depending on the starting position, as follows:
    - ① If “top left” or “bottom right” is selected as the starting position by the Page Mode Print Direction Set Command ([ESC] T), the print position will be shifted in the paper feed direction (vertical direction of a character). In this case, dots in the vertical direction (y) are used.
    - ② If “top right” or “bottom left” is selected as the starting position by the Page Mode Print Direction Set Command ([ESC] T), the print position will be shifted in the direction perpendicular to the paper feed direction (vertical direction of a character). In this case, dots in the horizontal direction (x) are used.
  - (6) The value in the table below must be applied if the specified feed length exceeds it.
 

|                        |        |
|------------------------|--------|
| B-EP2DL-GHxx (203 dpi) | 999 mm |
| B-EP4DL-GHxx (203 dpi) | 999 mm |
  - (7) If the value set in the parameter of this command is smaller than the feed length of a character, printing will be performed with one character superimposed on another. Therefore, care must be taken to select the feed length.

### 8.10.21 SWITCHING TO PAGE MODE COMMAND

[ESC] L

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Makes transition from standard mode to page mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format      | [ESC] L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Term        | ASCII: ESC L<br>Hex: 1Bh 4Ch                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Explanation | <p>(1) This command will be valid only if it is included at the beginning of a line.</p> <p>(2) This command will be valid if it is included in page mode.</p> <p>(3) The printer returns to standard mode after printing ends with the Page Mode Print Command ([FF]), or with the Switching to Standard Mode Command ([ESC] S).</p> <p>(4) The print data is expanded within the print area specified by the Page Mode Print Area Set Command ([ESC] W). Also, the starting position is the position in the print area specified by the Page Mode Print Direction Set Command ([ESC] T).</p> <p>(5) The following commands have different values in page and standard modes. So, the values are switched to the ones for page mode.</p> <ul style="list-style-type: none"> <li>① Spacing Set [ESC] [SP], [FS] S</li> <li>② Line Feed Set [ESC] 2, [ESC] 3</li> </ul> <p>(6) The parameter settings made when the following commands are received in standard mode are applied after switching to page mode.</p> <ul style="list-style-type: none"> <li>① [ESC] V Setting / canceling 90-degree rotation of character</li> <li>② [ESC] a Justifying print position</li> <li>③ [ESC] { Setting / canceling inverted printing</li> <li>④ [GS] L Setting left margin</li> <li>⑤ [GS] W Setting width of print area</li> </ul> <p>(7) The printer returns to standard mode by the Initialize Command ([ESC] @).</p> |
| Reference   | <p>Page Mode Print Command ([FF])</p> <p>Page Mode Cancel Command ([CAN])</p> <p>Page Mode Collective Print Command ([ESC] [FF])</p> <p>Switching to Standard Mode Command ([ESC] S)</p> <p>Page Mode Print Direction Set Command ([ESC] T)</p> <p>Page Mode Print Area Set Command ([ESC] W)</p> <p>Page Mode Relative Position in Vertical Direction Set Command ([GS] \)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**8.10.22 INTERNATIONAL CHARACTER SELECT COMMAND [ESC] R**

**Function**

Selects an international character set.

The value specified by this command is invalid because the B-EP series does not support this function.

**Format**

[ESC] Rn

**Term**

ASCII: ESC R  
Hex: 1Bh 52h

[Parameter]

n: Selecting international character set       $0 \leq n \leq 10$  ( $00h \leq n \leq 0Ah$ )

| n  | Character set |
|----|---------------|
| 0  | USA           |
| 1  | France        |
| 2  | Germany       |
| 3  | UK            |
| 4  | Denmark       |
| 5  | Sweden        |
| 6  | Italy         |
| 7  | Spain         |
| 8  | Japan         |
| 9  | Norway        |
| 10 | Denmark 2     |

**Default value**

n: 0

**Explanation**

- (1) Even if an international character set is switched between Japan and other countries by this command, there is no impact upon the Chinese character code system.

[Program example]

```
for(i=0;i<11;i++) {
 fprintf(stdprn, "\033R");/* Selecting country */
 fputc(i, stdprn);
 fprintf(stdprn, " # $ @ [\] ^ ` { | } ~ \n");
}
```

[Print example]

| 23h | 24h | 40h | 5Bh | 5Ch | 5Dh | 5Eh | 60h | 7Bh | 7Ch | 7Dh | 7Eh  |          |            |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|----------|------------|
| #   | \$  | @   | [   | \   | ]   | ^   | `   | {   |     | }   | ~    | ←アメリカ    | USA        |
| #   | \$  | à   | °   | ç   | §   | ^   | `   | é   | ù   | è   | ¨    | フランス     | France     |
| #   | \$  | §   | Ä   | ö   | Ü   | ^   | `   | ä   | ö   | ü   | ß    | ドイツ      | Germany    |
| £   | \$  | @   | [   | \   | ]   | ^   | `   | {   |     | }   | ~    | イギリス     | UK         |
| #   | \$  | @   | Æ   | Ø   | Å   | ^   | `   | æ   | ø   | å   | ~    | デンマーク I  | Denmark I  |
| #   | ¤   | É   | Ä   | ö   | Å   | Ü   | é   | ä   | ö   | å   | ü    | スウェーデン   | Sweden     |
| #   | \$  | @   | °   | \   | é   | ^   | `   | à   | ò   | è   | i    | イタリア     | Italy      |
| Pt  | \$  | @   | j   | Ñ   | ¿   | ^   | `   | ñ   | }   | ~   | スペイン | Spain    |            |
| #   | \$  | @   | [   | ¥   | ]   | ^   | `   | {   |     | }   | ~    | 日本       | Japan      |
| #   | ¤   | É   | Æ   | Ø   | Å   | Ü   | é   | æ   | ø   | å   | ü    | ノルウェー    | Norway     |
| #   | \$  | É   | Æ   | Ø   | Å   | Ü   | é   | æ   | ø   | å   | ü    | デンマーク II | Denmark II |

### 8.10.23 SWITCHING TO STANDARD MODE COMMAND [ESC] S

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Makes transition from page mode to standard mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Format      | [ESC] S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Term        | ASCII: ESC S<br>Hex: 1Bh 53h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Explanation | <p>(1) This command will be valid only if it is executed in page mode.</p> <p>(2) The data expanded in page mode is erased.</p> <p>(3) After this command is executed, the next print starting position is the beginning of a line.</p> <p>(4) The following commands have different values in page and standard modes. So, the values are switched to the ones for standard mode.</p> <ul style="list-style-type: none"><li>① Spacing Set [ESC] [SP], [FS] S</li><li>② Line Feed Length Set [ESC] 2, [ESC] 3</li></ul> <p>(5) Standard mode is selected at power-on, when resetting, or when the Initialize Command ([ESC] @) is executed.</p> <p>(6) The print area defined by the Page Mode Print Area Set Command ([ESC] W) is initialized.</p> |
| Reference   | Page Mode Print Command ([FF])<br>Page Mode Collective Print Command ([ESC] [FF])<br>Switching to Page Mode Command ([ESC] L)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**8.10.24 PAGE MODE PRINT DIRECTION SET COMMAND [ESC] T**

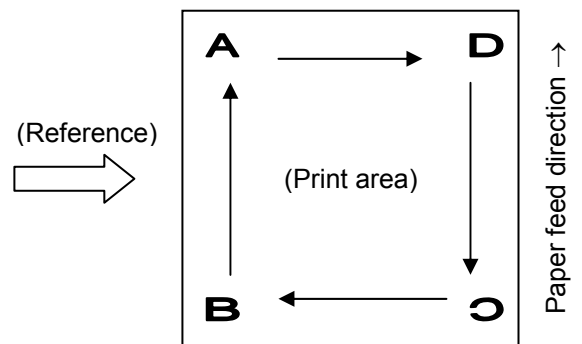
**Function** Selects a print direction and print starting point in page mode.

**Format** [ESC] Tn

**Term** ASCII: ESC T  
Hex: 1Bh 54h

[Parameter]  
n: Selecting print direction and starting point  $0 \leq n \leq 3$  ( $00h \leq n \leq 03h$ )  
 $48 \leq n \leq 51$  ( $30h \leq n \leq 33h$ )

| N     | Print direction |                                             |
|-------|-----------------|---------------------------------------------|
| 0, 48 | Left → Right    | Top left (A in the figure on the right)     |
| 1, 49 | Bottom → Top    | Bottom left (B in the figure on the right)  |
| 2, 50 | Right → Left    | Bottom right (C in the figure on the right) |
| 3, 51 | Top → Bottom    | Top right (D in the figure on the right)    |



**Default value** n: 0

- Explanation**
- (1) If this command is received while the printer is in standard mode, the defined parameter setting will be applied after switching to page mode.
  - (2) The position where characters are expanded is the starting position in the print area defined by the Page Mode Print Area Set Command ([ESC] W).

- Reference**
- Switching to Standard Mode Command ([ESC] S)
  - Switching to Page Mode Command ([ESC] L)
  - Page Mode Print Area Set Command ([ESC] W)
  - Relative Position Set Command ([ESC] \)
  - Page Mode Relative Position in Vertical Direction Set Command ([GS] \)

**8.10.25 CHARACTER ROTATION SET COMMAND**

**[ESC] V**

**Function** Sets or cancels the 90-degree rotation (clockwise) of a character.

**Format** [ESC] Vn

**Term** ASCII: ESC V  
Hex: 1Bh 56h

[Parameter]  
n: Selecting 90-degree rotation (clockwise)       $0 \leq n \leq 1$  (00h  $\leq$  n  $\leq$  01h)  
or  
 $48 \leq n \leq 49$  (30h  $\leq$  n  $\leq$  31h)

| N     |                                             |
|-------|---------------------------------------------|
| 0, 48 | Canceling 90-degree of rotation (clockwise) |
| 1, 49 | Setting 90-degree of rotation (clockwise)   |

**Default value** n: 0

**Explanation**

- (1) Even if underlining is set, a character rotated 90 degrees clockwise will not be underlined.
- (2) If 90-degree of rotation (clockwise) is set, a relationship between double width and double height is the reverse of the one when 90-degree rotation is canceled.
- (3) The command setting does not have any impacts upon page mode.
- (4) If this command is received while the printer in page mode, the defined parameter setting will be applied after switching to standard mode.

**Reference** Print Mode All Set Command ([ESC] !)  
Underlining Set Command ([ESC] -)

### 8.10.26 PAGE MODE PRINT AREA SET COMMAND

[ESC] W

**Function** Specifies a position and size of the print area in page mode.

**Format** [ESC] WxLxHyLyHdxLdxHdyLdyH

**Term** ASCII: ESC W  
Hex: 1Bh 57h

[Parameter]

xL : Starting point in horizontal direction (low order)  $0 \leq xL \leq 255$  (00h  $\leq$  xL  $\leq$  FFh)

xH : Starting point in horizontal direction (high order)  $0 \leq xH \leq 255$  (00h  $\leq$  xH  $\leq$  FFh)

yL : Starting point in vertical direction (low order)  $0 \leq yL \leq 255$  (00h  $\leq$  yL  $\leq$  FFh)

yH : Starting point in vertical direction (high order)  $0 \leq yH \leq 255$  (00h  $\leq$  yH  $\leq$  FFh)

dxL : Length in horizontal direction (low order)  $0 \leq dxL \leq 255$  (00h  $\leq$  dxL  $\leq$  FFh)

dxH : Length in horizontal direction (high order)  $0 \leq dxH \leq 255$  (00h  $\leq$  dxH  $\leq$  FFh)

dyL : Length in vertical direction (low order)  $0 \leq dyL \leq 255$  (00h  $\leq$  dyL  $\leq$  FFh)

dyH : Length in vertical direction (high order)  $0 \leq dyH \leq 255$  (00h  $\leq$  dyH  $\leq$  FFh)

\* Starting point in horizontal direction =  $xL + xH \times 256$  dots

Starting point in vertical direction =  $yL + yH \times 256$  dots

Length in horizontal direction =  $dxL + dxH \times 256$  dots

Length in vertical direction =  $dyL + dyH \times 256$  dots

**Default value** B-EP2DL-GHxx: xL=xH=yL=yH=0, dxL=80h dxH=01h dyL=80h dyH=01h

B-EP4DL-GHxx: xL=xH=yL=yH=0, dxL=40h dxH=03h dyL=40h dyH=03h

- Explanation**
- (1) If this command is received while the printer in standard mode, the defined parameter setting will be applied after switching to page mode.
  - (2) If the starting point in the horizontal or vertical direction is out of the print area, command processing will be aborted, and the subsequent data will be processed as normal data.
  - (3) If the length in the horizontal or vertical direction is 0, command processing will be aborted, and the subsequent data will be processed as normal data.
  - (4) The position where characters are expanded is the starting position in the print area defined by the Page Mode Print Direction Set Command ([ESC] T).



- (5) At a moment when an error occurs with parameter xL to dyH due to a factor such as an unmatched condition, command processing will be aborted, and the data subsequent to dyH will be processed as normal data.
- (6) If the following commands, which are used commonly among the B-EP series, are received, a higher priority will be given to them. Therefore, the same range as these commands cannot be specified.

|                     |
|---------------------|
| [ESC] WS [LF] [NUL] |
| [ESC] WT [LF] [NUL] |
| [ESC] WB [LF] [NUL] |
| [ESC] WR [LF] [NUL] |
| [ESC] WW [LF] [NUL] |

(Example)

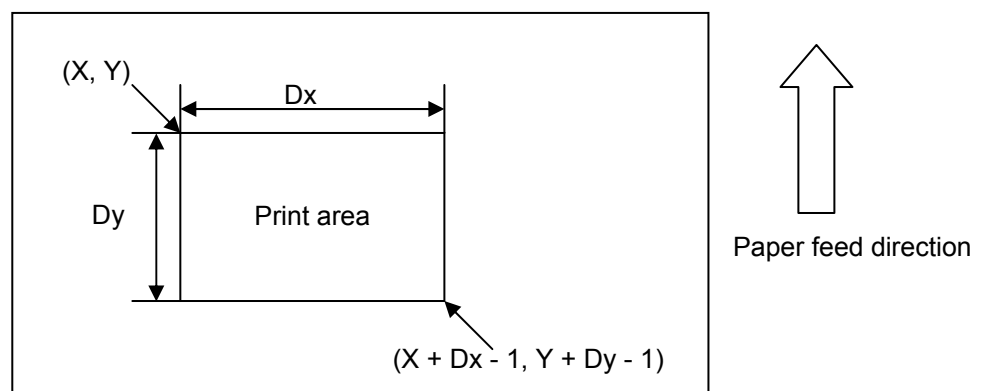
|         |           |           |           |           |            |            |            |            |
|---------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| [ESC] W | <u>xL</u> | <u>xH</u> | <u>yL</u> | <u>yH</u> | <u>dxL</u> | <u>dxH</u> | <u>dyL</u> | <u>dyH</u> |
|         | ↓         | ↓         | ↓         | ↓         | ↓          | ↓          | ↓          | ↓          |
|         | S         | 10        | 0         | 0         | 160        | 1          | 160        | 1          |

The above values are specified. If inputted in hex format, they are as follows:

[1BH][57H][53H][0AH][00H][00H][A0H][01H][A0H][01H]

However the underlined portion is considered as [ESC] WS [LF] [NUL]. Therefore, a priority is given to the Status Request Command rather than the Page Mode Print Area Set Command.

- (7) The figure below illustrates a print area with the starting point in the horizontal direction X, starting point in the vertical direction Y, length in the horizontal direction Dx, and length in the vertical direction Dy.



**8.10.27 JUSTIFICATION COMMAND**

**[ESC] a**

**Function** Justifies print data.

**Format** [ESC] an

**Term** ASCII: ESC a  
Hex: 1Bh 61h

[Parameter]  
n: Justifying print position  $0 \leq n \leq 2$  (00h  $\leq$  n  $\leq$  02h)  
or  
 $48 \leq n \leq 50$  (30h  $\leq$  n  $\leq$  32h)

0: Left-justifying

1: Centering

2: Right-justifying

**Default value** n: 0

**Explanation**

- (1) This command will be executed only if it is received at the beginning of a line.
- (2) If this command is received while the printer in page mode, the defined parameter setting will be applied after switching to standard mode.
- (3) Justification is performed within the specified print area.
- (4) Justification also applies to a portion skipped by the Horizontal Tab Command ([HT]), Absolute Position Set Command ([ESC] \$), or Relative Position Set Command ([ESC] \).

**8.10.28 PANEL KEY (FEED KEY) SET COMMAND**

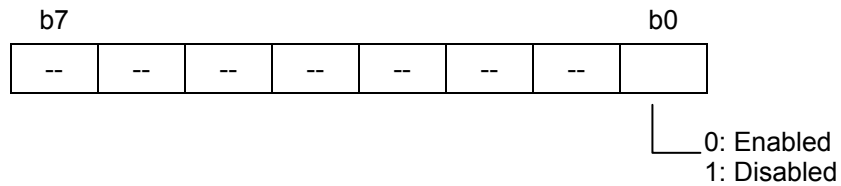
**[ESC] c5**

**Function** Enables or disables the panel key (FEED key).

**Format** [ESC] c5n

**Term** ASCII: ESC c 5  
Hex: 1Bh 63h 35h

[Parameter]  
n: Selecting / deselecting printer  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



**Default value** n: 0

- Explanation**
- (1) n is valid only in the least significant bit.
  - (2) The [FEED] key will be disabled if the parameter is set to “Disabled.”
  - (3) While waiting for the [FEED] key entry when a macro is executed, the [FEED] key is enabled regardless of the parameter setting of this command. However, paper feed is not performed.

**8.10.29 PAPER FEED LENGTH SET COMMAND**

**[ESC] d**

**Function** Prints data and feeds paper over n lines. However, the specified number of lines that paper is fed over is not stored.

**Format** [ESC] d

**Term** ASCII: ESC d  
Hex: 1Bh 64h

[Parameter]

n: No. of lines that paper is fed over  $0 \leq n \leq 255$  (00h  $\leq$  n  $\leq$  FFh)

**Explanation** (1) After this command is executed, the next print starting position is the beginning of a line.

(2) There is no impact upon the line feed length defined by the feed length set commands ([ESC] 2 or [ESC] 3).

(3) The value in the table below must be applied if  $n \times$  line feed length exceeds it.

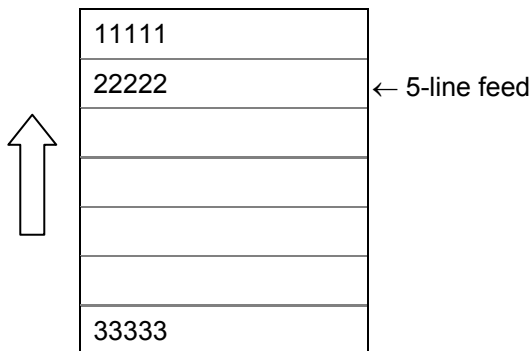
|                        |        |
|------------------------|--------|
| B-EP2DL-GHxx (203 dpi) | 999 mm |
| B-EP4DL-GHxx (203 dpi) | 999 mm |

(4) The line feed length is 30 dots per line.

[Program example]

```
fprintf(stdprn, "11111\n");
fprintf(stdprn, "22222");
fprintf(stdprn, "\033d\x05"); /* 5-line feed */
fprintf(stdprn, "33333\n");
```

[Print example]



**8.10.30 CODE PAGE NO. SELECT COMMAND**

**[ESC] t**

**Function** Selects a code page No.

**Format** [ESC] tn

**Term** ASCII: ESC t  
Hex: 1Bh 74h

[Parameter]

n: Selecting code page No.  $0 \leq n \leq 5$  (00h  $\leq$  n  $\leq$  05h)  
n = 255 (n = FFh)

- 0: PC437 (USA: Standard Europe)
- 1: Japanese (Katakana)
- 2: PC850 (Multilingual)
- 3: PC860 (Portuguese)
- 4: PC863 (Canadian-French)
- 5: PC865 (Nordic)
- 255: Blank page

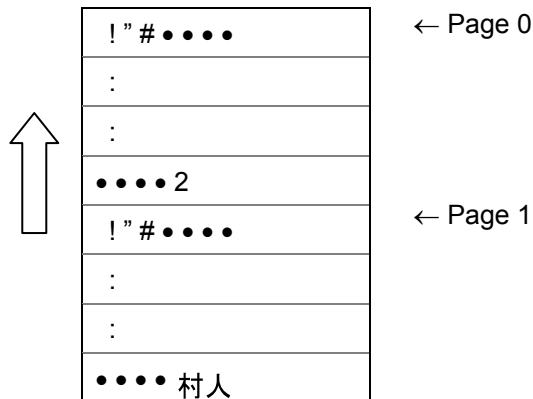
**Default value** n: 0

**Explanation** (1) PC850 is the only code page that the B-EP series supports. Therefore, any values other than 2 are invalid.

[Program example]

```
for(i=0;i<2;i++) {
 fprintf(stdprn, "\033t"); /* Selecting code page */
 fputc(i, stdprn);
 for(j=0x20;j<0xff;j++) {
 fputc(j, stdprn);
 }
 fprintf(stdprn, "\n\r");
}
```

[Print example]



**8.10.31 INVERTED PRINTING SET COMMAND**

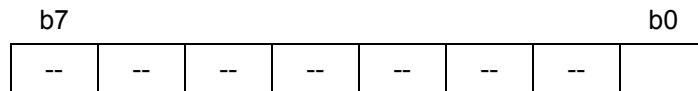
**[ESC] {**

**Function** Sets or cancels inverted printing (upside-down).

**Format** [ESC] {n

**Term** ASCII: ESC {  
Hex: 1Bh 7Bh

[Parameter]  
n: Setting/canceling inverted printing  $0 \leq n \leq 255$  (00h  $\leq$  n  $\leq$  FFh)



└─ 0: Canceling inverted printing  
   1: Setting inverted printing

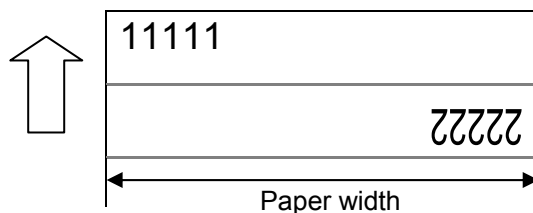
**Default value** n: 0

- Explanation**
- (1) n is valid only in the least significant bit.
  - (2) This command is executed only if it is received at the beginning of a line.
  - (3) Inverted printing means that a line is inverted 180 degrees and printed.
  - (4) Inverted printing is performed in the direction opposed to normal printing.
  - (5) If this command is received while the printer is in page mode, the defined parameter setting will be applied after switching to standard mode.

[Program example]

```
fprintf(stdprn, "\033{"); /* Canceling inverted printing */
fputc(0, stdprn);
fprintf(stdprn, "11111\n");
fprintf(stdprn, "\033{"); /* Setting inverted printing */
fputc(1, stdprn);
fprintf(stdprn, "22222\n");
```

[Printer example]



### 8.10.32 ABSOLUTE POSITION SET COMMAND

[ESC] \$

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Specifies an absolute position.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Format      | [ESC] \$nLnH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Term        | ASCII: ESC \$<br>Hex: 1Bh 24h                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|             | <p>[Parameter]</p> <p>n: No. of dots to specify absolute position (low order)    <math>0 \leq nL \leq 255</math> (<math>00h \leq nL \leq FFh</math>)<br/> n: No. of dots to specify absolute position (high order)    <math>0 \leq nH \leq 255</math> (<math>00h \leq nH \leq FFh</math>)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Explanation | <p>(1) An absolute position of the subsequent print starting position is specified with reference to the left margin. The next print starting position is located <math>(nL + nH \times 256) / \text{dots}</math> away from the left margin.</p> <p>(2) An absolute position out of the print area is ignored.</p> <p>(3) Dots in the horizontal direction (x) are applied in standard mode.</p> <p>(4) The printer operation varies in page mode depending on the starting position as follows:</p> <p>① If “top left” or “bottom right” is selected as the starting point defined by the Page Mode Print Direction Set Command ([ESC] T), an absolute position in the direction perpendicular to the paper feed direction (horizontal direction of a character) is specified.</p> <p>② If “top right” or “bottom left” is selected as the starting point defined by the Page Mode Print Direction Set Command ([ESC] T), an absolute position in the paper feed direction (horizontal direction of a character) is specified.</p> |
| Reference   | <p>Relative Position Set Command ([ESC] \)</p> <p>Page Mode Absolute Position in Vertical Direction Set Command ([GS] \$)</p> <p>Page Mode Relative Position in Vertical Direction Set Command ([GS] \)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

### 8.10.33 RELATIVE POSITION SET COMMAND

[ESC] \

**Function** Specifies a relative position.

**Format** [ESC] \nLnH

**Term** ASCII: ESC \  
Hex: 1Bh 5Ch

[Parameter]

n: No. of dots to specify relative position (low order)  $0 \leq nL \leq 255$  (00h  $\leq$  nL  $\leq$  FFh)

n: No. of dots to specify relative position (high order)  $0 \leq nH \leq 255$  (00h  $\leq$  nH  $\leq$  FFh)

**Default value** Not defined.

- Explanation**
- (1) A relative position of the subsequent print starting position is specified with reference to a current position. The next print starting position is located  $(nL + nH \times 256)$  away from the current position.
  - (2) A relative position out of the print area is ignored.
  - (3) If the right direction of the current position is specified, a positive number must be defined. If the left direction of the current position is specified, a negative number must be defined.
  - (4) A negative number is represented by a complement number of 65535.  
Ex.) To specify N dots in the left (negative) direction  
$$nL + nH \times 256 = 65536 - N.$$
  - (5) Dots in the horizontal direction (x) are applied in standard mode.
  - (6) The printer operation varies in page mode depending on the starting position as follows:
    - ① If "top left" or "bottom right" is selected as the starting point in the Page Mode Print Direction Set Command ([ESC] T), a relative position in the direction perpendicular to the paper feed direction (horizontal direction of a character) is specified.
    - ② If "top right" or "bottom left" is selected as the starting point in the Page Mode Print Direction Set Command ([ESC] T), a relative position in the paper feed direction (horizontal direction of a character) is specified.

**Reference** Absolute Position Set Command ([ESC] \$)



### 8.10.34 CHINESE CHARACTER PRINT MODE ALL SET COMMAND [FS] !

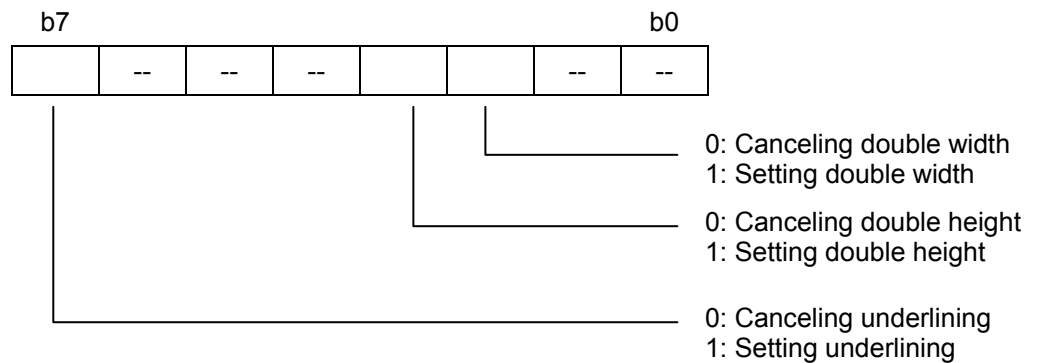
**Function** Specifies printing mode for Chinese characters altogether.

**Format** [FS] !

**Term** ASCII: FS!  
Hex: 1Ch 21h

[Parameter]

n: Specifying character control of Chinese character  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



**Default value** n: 0

- Explanation**
- (1) If both double width and double height are specified, a character size will be quadrupled (double width × double height).
  - (2) Chinese characters including space on both sides of them are underlined. However, a portion skipped by the Horizontal Tab Command ([HT]) or a character rotated 90 degrees clockwise is not underlined.
  - (3) The width of an underline for Chinese characters is determined in accordance with the width defined by the Chinese Character Underlining Set Command ([FS] -).
  - (4) If characters with different magnifications in the vertical direction coexist in the same line, they will be aligned to the baseline.
  - (5) The size of Chinese characters can also be specified by the Chinese Character Magnification Set Command ([FS] W) or Character Size Set Command ([GS] !). But the most recently processed command is applied.
  - (6) Underlining for Chinese characters can also be set or canceled by the Chinese Character Underlining Set Command ([FS] -), but the most recently processed command is applied.
  - (7) The parameter setting applies to the Chinese language settings with Chinese language implemented for the QM model (destined overseas), or to the Korean language setting with Korean language implemented.

**8.10.35 CHINESE CHARACTER MODE SET COMMAND [FS] &**

Function

Prints Chinese characters.

Format

[FS] &

Term

ASCII: FS&  
Hex: 1Ch 26h

Explanation

- (1) If this command is received with shift JIS selected for a Chinese character code system, the defined parameter setting will be applied when the Chinese character code system is changed to JIS. There is no impact upon printing.
- (2) Chinese character mode is canceled by default.
- (3) A Chinese character code is processed from the 1st to the 2nd byte.
- (4) The parameter setting applies to the Chinese language settings with Chinese language implemented for the QM model (destined overseas), or to the Korean language setting with Korean language implemented.

Reference

Chinese Character Mode Cancel Command ([FS] .)  
Chinese Character Code System Set Command ([FS] C)

### 8.10.36 CHINESE CHARACTER UNDERLINING SET COMMAND [FS] -

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Sets or cancels underlining for ANK characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Format        | [FS]-n                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Term          | <p>ASCII: FS-</p> <p>Hex: 1Ch 2Dh</p> <p>[Parameter]</p> <p>n: Setting underlining for Chinese character      <math>0 \leq n \leq 2</math> (<math>00h \leq n \leq 02h</math>)<br/> or<br/> <math>48 \leq n \leq 50</math> (<math>30h \leq n \leq 32h</math>)</p> <p>0: Canceling underlining<br/> 1: Setting underlining (1-dot wide)<br/> 2: Setting underlining (2-dot wide)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Default value | n: 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Explanation   | <p>(1) Chinese characters including space on both sides of them are underlined. However, a portion skipped by the Horizontal Tab Command ([HT]) or a character rotated 90 degrees clockwise is not underlined.</p> <p>(2) If underlining Chinese characters is canceled with <math>n = 0</math>, the subsequent Chinese characters will not be underlined. However, the width of the underline immediately before canceling the underline is maintained. Also, a 1-dot wide underline is selected by default.</p> <p>(3) The width of an underline for Chinese characters is consistent regardless of a character size.</p> <p>(4) Underlining Chinese characters can also be set or canceled by the Chinese Character Print Mode All Set Command ([FS] !), but the most recently processed command is applied.</p> <p>(5) The parameter setting applies to the Chinese language settings with Chinese language implemented for the QM model (destined overseas), or to the Korean language setting with Korean language implemented.</p> |
| Reference     | Chinese Character Print Mode All Set Command ([FS] !)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

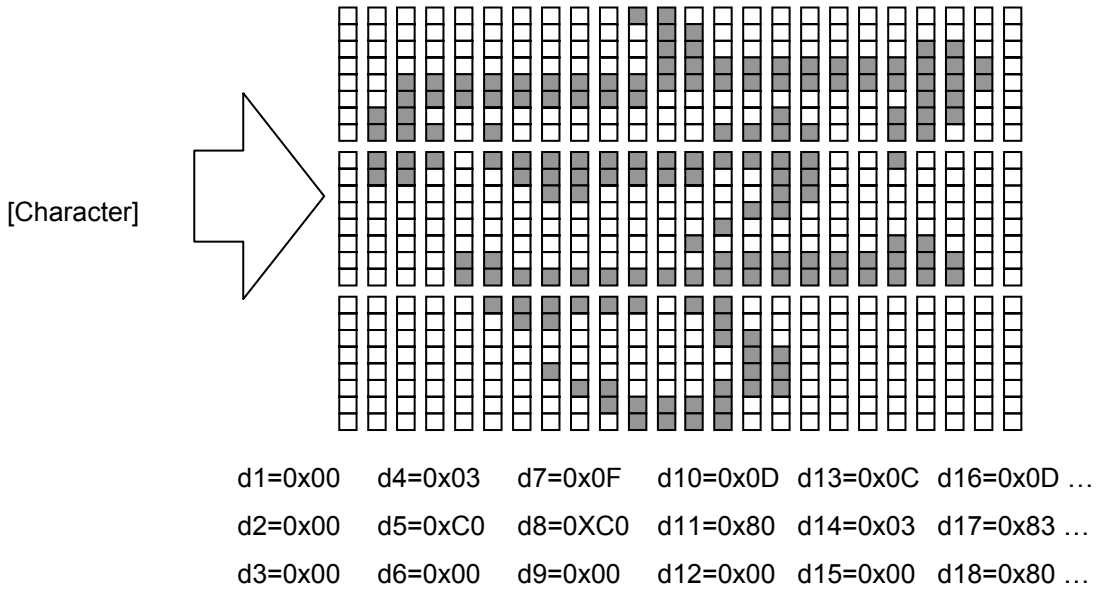
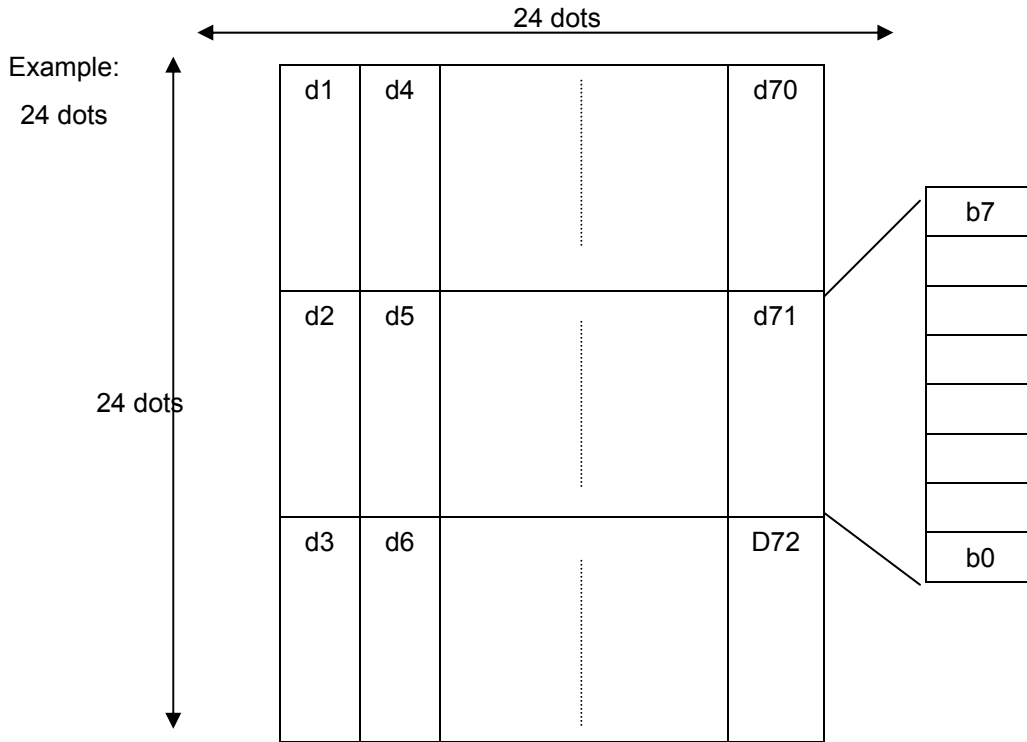
### 8.10.37 CHINESE CHARACTER MODE CANCEL COMMAND [FS] .

|             |                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Cancels Chinese character mode.                                                                                                                                                                                                                                                                  |
| Format      | [FS] .                                                                                                                                                                                                                                                                                           |
| Term        | ASCII: FS.<br>Hex: 1Ch 2Eh                                                                                                                                                                                                                                                                       |
| Explanation | (1) If this command is received with shift JIS selected for a Chinese character code system, the defined parameter setting will be applied when the Chinese character code system is changed to JIS. There is no impact upon printing.<br><br>(2) Chinese character mode is canceled by default. |
| Reference   | Chinese Character Mode Set Command ([FS] &)<br>Chinese Character Code System Set Command ([FS] C)                                                                                                                                                                                                |

### 8.10.38 WRITABLE CHARACTER OF CHINESE CHARACTER DEFINE COMMAND [FS] 2

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Specifies writable characters of Chinese characters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Format        | [FS] 2a1a2 [d <sub>1</sub> d <sub>2</sub> d <sub>3</sub> ...d <sub>k</sub> ]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Term          | <p>ASCII: FS2<br/>Hex: 1Ch 32h</p> <p>[Parameter]<br/> a1: Writable character code (high order)<br/> a2: Writable character code (low order)<br/> JIS code: a1 = 77h, 21h ≤ a2 ≤ 7Eh<br/> Shift JIS: a1 = ECh, 40h ≤ a2 ≤ 9Eh (except for 7Fh)<br/> EUC code: a1 = F7h, A1h ≤ a2 ≤ FEh<br/> Chinese/Korean: a1 = FFh, 40h ≤ a2 ≤ 7Eh, 80h ≤ a2 ≤ FCh<br/> d: Data to be defined 0 ≤ d ≤ 255<br/> Data consists of 72 bytes (k = 72) (3 bytes (high) × 24 dots)</p>                                                                                                                                                                                                 |
| Default value | All space                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Explanation   | <p>(1) a1 and a2 refer to a Chinese character code to define writable characters. a1 refers to the 1st byte, and a2 the 2nd byte.</p> <p>(2) d refers to data to be defined. A bit corresponding to a dot to be printed is 1, and the one corresponding to a dot not to be printed is 0.</p> <p>(3) Font A accepts 94 characters.</p> <p>(4) At a moment when an error occurs with parameter a1 or a2 due to a factor such as an unmatched condition, command processing will be aborted, and the data subsequent to a2 will be processed as normal data.</p> <p>(5) The defined writable characters apply until resetting or until the printer is turned off.</p> |
| Reference     | Chinese Character Code System Set Command ([FS] C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

[Defined character] Example of font A



**8.10.39 CHINESE CHARACTER CODE SYSTEM SET COMMAND [FS] C**

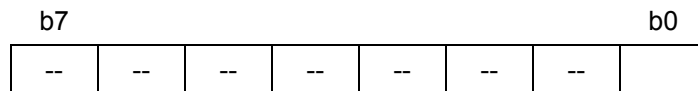
**Function** Selects a Chinese character code system.

**Format** [FS] Cn

**Term** ASCII: FS C  
Hex: 1Ch 43h

[Parameter]

n: Selecting Chinese character code system n = 0, 1 (n = 00h, 01h)



└─ 0: JIS code system  
1: Shift JIS code system

**Default value** n: 0

- Explanation**
- (1) For JIS code, valid Chinese character codes are 21 to 7Eh for both the 1st and 2nd bytes.
  - (2) For shift JIS code, valid Chinese character codes are as follows:  
 1st byte: 81h to 9Fh, or E0h to EFh  
 2nd byte: 40h to 7Eh, or 80h to FCh
  - (3) There is no impact upon the setting with Chinese or Korean language implemented.

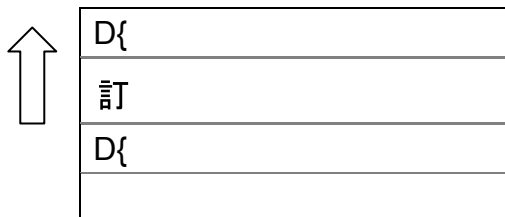
[Program example]

```

fprintf(stdprn, "\034C\x01"); /* SHIFT-JIS selected */
fprintf(stdprn, "\x44\x7b\n");
fprintf(stdprn, "\034C%c",0x00); /* JIS selected */
fprintf(stdprn, "\034&"); /* Beginning of Chinese character */
fprintf(stdprn, "\x44\x7b\n");
fprintf(stdprn, "\034."); /* End of Chinese character */
fprintf(stdprn, "\x44\x7b\n");

```

[Print example]



[Example]

- ① <SJIS>123ABCあい<ANK>アイ  
[1C][43][01][1C][26][31][32][33][41][42][43][82][A0][82][A2][82][A4][1C][2E][B1][B2][B3]
- ② <ANK>123ABC<JIS>あい<ANK>アイ  
[1C][2E][31][32][33][41][42][43][1C][43][00][1C][26][24][22][24][24][24][26][1C][2E][B1][B2][B3]
- ③ <ANK>123ABC<SJIS>あい<ANK>アイ  
[1C][2E][31][32][33][41][42][43][1C][43][01][1C][26][82][A0][82][A2][82][A4][1C][2E][B1][B2][B3]
- ④ <SJIS>123ABCあいアイ  
[1C][43][01][1C][26][31][32][33][41][42][43][82][A0][82][A2][82][A4][B1][B2][B3]
- ⑤ <ANK>123ABC<SJIS>あいアイ  
[1C][2E][31][32][33][41][42][43][1C][43][01][1C][26][82][A0][82][A2][82][A4][B1][B2][B3]
- ⑥ <ANK>123ABC<JIS>あいアイ  
[1C][2E][31][32][33][41][42][43][1C][43][00][1C][26][24][22][24][24][24][26][B1][B2][B3]

Reference

- Chapter 12 Character Code Table
- Chapter 13 Chinese Character Code Table



**8.10.40 CHINESE CHARACTER SPACING SET COMMAND [FS] S**

**Function** Specifies spacing (or the number of dots) on both sides of a Chinese character.

**Format** [FS] Sn1n2

**Term** ASCII: FS S  
Hex: 1Ch 53h

**[Parameter]**

n1: Spacing on the left of Chinese character  $0 \leq n1 \leq 99$  (00h  $\leq$  n1  $\leq$  63h)

n2: Spacing on the right of Chinese character  $0 \leq n2 \leq 99$  (00h  $\leq$  n2  $\leq$  63h)

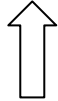
**Default value** n1: 0, n2: 0

- Explanation**
- (1) Spacing defined this command is the one when a character size is standard. If a character with a magnification of x 2 or over in the horizontal direction is expanded, spacing will be determined by the specified spacing  $\times$  magnification in the horizontal direction.
  - (2) A sum of spacing on both sides of a character must never exceed 99. If so, it will be changed to 99.
  - (3) Spacing can be independently specified in page and standard modes.
  - (4) If a double-width character is specified, spacing will also be doubled.
  - (5) For the B-EP series, spacing on the left of a Chinese character is added to spacing on its right. Therefore, there is no space found on the left of the Chinese character in the print output.

[Program example]

```
fprintf(stdprn, "\034S%c\x02",0x00); /* 2 dots on the right of character */
fprintf(stdprn, "\x82\x50\x82\x50\x82\x50\x82\x50\x82\x50\n");
fprintf(stdprn, "\034S%c\x1c",0x00); /* 28 dots on the right of character */
fprintf(stdprn, "\x82\x51\x82\x51\x82\x51\x82\x51\x82\x51\n");
```

[Print example]



|         |
|---------|
| 1111    |
| 2 2 2 2 |
|         |

### 8.10.41 CHINESE CHARACTER MAGNIFICATION SET COMMAND [FS] W

**Function** Sets or cancels the quadrupling of Chinese character (double height × double width).

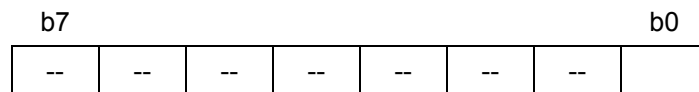
**Format** [FS] Wn

**Term** ASCII: FS W  
Hex: 1Ch 57h

[Parameter]

n: Setting quadrupling of Chinese character (double height × double width)

$$0 \leq n \leq 255 \quad (00h \leq n \leq FFh)$$



└ 0: Canceling quadrupling  
1: Setting quadrupling

**Default value** n: 0

- Explanation**
- (1) n is valid only in the least significant bit.
  - (2) If the quadrupling of a Chinese character (double height × double width) is canceled by this command, the subsequent Chinese character is printed in standard size (x 1).
  - (3) A Chinese character size can also be specified by the Character Size Set Command ([GS] !) or Chinese Character Print Mode All Set Command ([FS] !), but the most recently processed command is applied.

**Reference** Chinese Character Print Mode All Set Command ([FS] !)  
Character Size Set Command ([GS] !)

### 8.10.42 PAGE MODE ABSOLUTE POSITION SET COMMAND [GS] \$

|          |                                                                        |
|----------|------------------------------------------------------------------------|
| Function | Specifies an absolute position in the vertical direction in page mode. |
| Format   | [GS] \$nLnH                                                            |
| Term     | ASCII: GS \$<br>Hex: 1Dh 24h                                           |

[Parameter]

nL: Specifying absolute position in the vertical direction in page mode (low order)  
 $0 \leq nL \leq 255$  ( $00h \leq nL \leq FFh$ )

nH: Specifying absolute position in the vertical direction in page mode (high order)  
 $0 \leq nH \leq 255$  ( $00h \leq nH \leq FFh$ )

Default value

- Explanation
- (1) An absolute position of the data expansion starting position in the vertical direction in page mode is specified with reference to the starting position. The next data expansion starting position is shifted ( $nL + nH \times 256$ ) dots away from the current position in the vertical direction.
  - (2) This command is ignored except when page mode is selected.
  - (3) An absolute position in the vertical direction out of the specified print area is ignored.
  - (4) A starting position, which is a reference to an absolute position, is specified in the Page Mode Print Direction Set Command ([ESC] T).

- Reference
- Absolute Position Set Command ([ESC] \$)
  - Page Mode Print Direction Set Command ([ESC] T)
  - Page Mode Print Area Set Command ([ESC] W)
  - Relative Position Set Command ([ESC] \)
  - Page Mode Relative Position in Vertical Direction Set Command ([GS] \)

**8.10.43 REVERSE CHARACTER SET COMMAND**

**[GS] B**

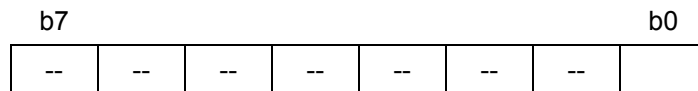
**Function** Sets or cancels reverse characters (white text on black)

**Format** [FS] Bn

**Term** ASCII: GS B  
Hex: 1Dh 42h

[Parameter]

n: Setting reverse characters  $0 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )



└ 0: Canceling reverse character  
1: Setting reverse character

**Default value** n: 0

- Explanation**
- (1) n is valid only in the least significant bit.
  - (2) Reversed printing applies to the internal and downloaded characters.
  - (3) Reversed printing also applies to spacing on the right of a character defined by the Spacing Set Command ([ESC] [SP]).
  - (4) There is no impact upon bit images, downloaded bit images, barcodes, or HRI characters, or a portion skipped by the Horizontal Tab Command ([HT]) or Relative Position Set Command ([ESC] \).
  - (5) There is no impact upon spacing between lines.
  - (6) A higher priority is given to reversed printing than underlining. Therefore, even if underlining is specified, reverse characters will not be underlined. However, the underlining settings will remain unchanged.

**8.10.44 ID TRANSMISSION COMMAND**

**[GS] I**

**Function** Transmits the following ID specified by n.

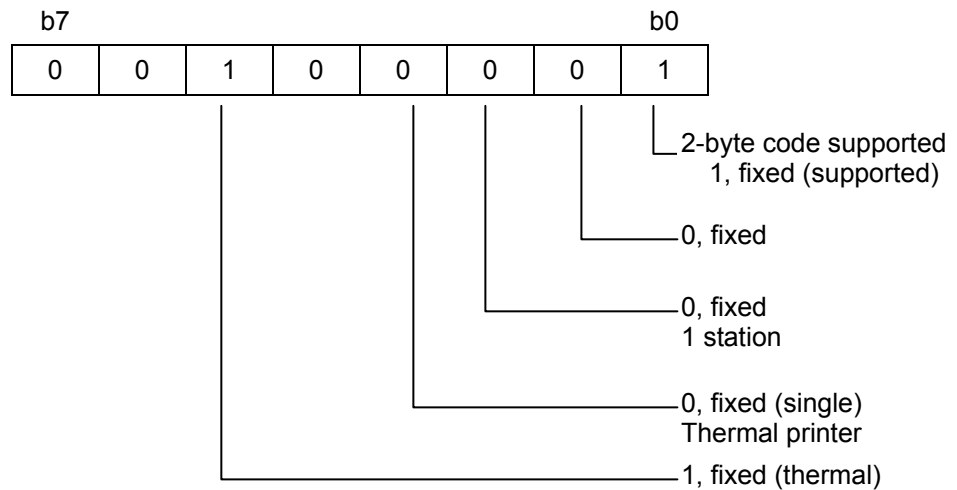
**Format** [GS] In

**Term** ASCII: GS I  
Hex: 1Dh 49h

[Parameter]

n: Selecting ID to transmit  $1 \leq n \leq 3$  (01h  $\leq$  n  $\leq$  03h)  
or  
 $49 \leq n \leq 51$  (31h  $\leq$  n  $\leq$  33h)

| n | ID type          | ID to transmit                         |
|---|------------------|----------------------------------------|
| 1 | Model ID         | 0CH (12)                               |
| 2 | Type ID          | See (1) below for further information. |
| 3 | Firmware version | See (2) below for further information. |



**Default value** n:

**Explanation** (1) Type ID is fixed at 21H for this printer.

(2) The firmware version is updated as below every time firmware is upgraded or revised:

A(41H) → B(42H) → C(43H) → ⋯ → Z(5AH) → a(61H) → b(62H) → ...

### 8.10.45 PAGE MODE RELATIVE POSITION IN VERTICAL DIRECTION SET COMMAND [GS] \

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function      | Specifies a relative position in the vertical direction in page mode.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Format        | [GS] \nLnH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Term          | ASCII: GS \<br>Hex: 1Dh 5Ch<br><br>[Parameter]<br>nL: Specifying relative position in the vertical direction in page mode (low order)<br>$0 \leq nL \leq 255$ (00h $\leq$ nL $\leq$ FFh)<br>nH: Specifying relative position in the vertical direction in page mode (high order)<br>$0 \leq nH \leq 255$ (00h $\leq$ nH $\leq$ FFh)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Default value |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Explanation   | <p>(1) A relative position of the data expansion starting position in the vertical direction in page mode is specified with reference to a current position. The next data expansion starting position is shifted (<math>nL + nH \times 256</math>) dots away from the current position in the vertical direction.</p> <p>(2) This command is ignored except when page mode is selected.</p> <p>(3) In JIS standard characters, “¥” is equivalent to “\”.</p> <p>(4) A relative position in the vertical direction out of the specified print area is ignored.</p> <p>(5) A positive number must be specified for the downward direction, and a negative number for the upward direction.</p> <p>(6) The number of dots is determined by <math>nH \times 256 + nL</math>.</p> <p>(7) N dots in the upward (negative) direction are specified by a complement number of N.<br/>- N dots = 65536 - N</p> |
| Reference     | <p>Absolute Position Set Command ([ESC] \$)</p> <p>Page Mode Print Direction Set Command ([ESC] T)</p> <p>Page Mode Print Area Set Command ([ESC] W)</p> <p>Relative Position Set Command ([ESC] \)</p> <p>Page Mode Absolute Position in Vertical Direction Set Command ([GS] \$)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**8.10.47 BARCODE PRINT COMMAND**

**[GS] k**

**Function** Selects a barcode system and prints barcodes.

**Format** ① [GS] km [d<sub>1</sub>d<sub>2</sub>d<sub>3</sub>...d<sub>k</sub>] [NUL]

② [GS] kmn [d<sub>1</sub>d<sub>2</sub>d<sub>3</sub>...d<sub>n</sub>]

**Term** ASCII: GS k  
Hex: 1Dh 6Bh

[Parameter]

m: Barcode type

①:  $0 \leq m \leq 6$  (00h  $\leq$  m  $\leq$  06h)

The ranges of k and d vary depending on the selected barcode system.

②:  $65 \leq m \leq 73$  (41h  $\leq$  m  $\leq$  49h)

The ranges of n and d vary depending on the selected barcode system.

①

| m | Barcode type             | Range of k                       | Range of d (ASCII)            |
|---|--------------------------|----------------------------------|-------------------------------|
| 0 | UPC-A                    | $11 \leq k \leq 12$              | 0 to 9                        |
| 1 | UPC-E                    | $11 \leq k \leq 12$              | 0 to 9                        |
| 2 | JAN13 (EAN)              | $12 \leq k \leq 13$              | 0 to 9                        |
| 3 | JAN8 (EAN)               | $7 \leq k \leq 8$                | 0 to 9                        |
| 4 | CODE39                   | $1 \leq k$                       | SP,\$,%,+,-,.,/,0 to 9,A to Z |
| 5 | Interleaved 2 of 5 (ITF) | $1 \leq k$<br>(even number only) | 0 to 9                        |
| 6 | NW-7                     | $1 \leq k$                       | ,\$,+,-,.,/,;,0 to 9,A to D   |

②

| m  | Barcode type             | Range of n                                | Range of d (ASCII)            |
|----|--------------------------|-------------------------------------------|-------------------------------|
| 65 | UPC-A                    | $11 \leq n \leq 12$                       | 0 to 9                        |
| 66 | UPC-E                    | $11 \leq n \leq 12$                       | 0 to 9                        |
| 67 | JAN13 (EAN)              | $12 \leq n \leq 13$                       | 0 to 9                        |
| 68 | JAN8 (EAN)               | $7 \leq n \leq 8$                         | 0 to 9                        |
| 69 | CODE39                   | $1 \leq n \leq 255$                       | SP,\$,%,+,-,.,/,0 to 9,A to Z |
| 70 | Interleaved 2 of 5 (ITF) | $1 \leq n \leq 255$<br>(even number only) | 0 to 9                        |
| 71 | NW-7                     | $1 \leq n \leq 255$                       | ,\$,+,-,.,/,;,0 to 9,A to D   |
| 72 | CODE93                   | $1 \leq n \leq 255$                       | 0x00 to 0x7F                  |
| 73 | CODE128                  | $2 \leq n \leq 255$                       | 0x00 to 0x7F                  |



Explanation

①

- (1) This command ends with the [NUL] code.
- (2) For UPC-A and UPC-E, upon the input of 12-byte barcode data, a barcode is printed. The data subsequent to it is processed as normal data.
- (3) For JAN13, upon the input of 13-byte barcode data, a barcode is printed. The data subsequent to it is processed as normal data.
- (4) For JAN8, upon the input of 8-byte barcode data, a barcode is printed. The data subsequent to it is processed as normal data.
- (5) The number of data items of ITF barcode must be an even number. If it is an odd number, the final data will be ignored.

②

- (1) n refers to the number of data items. n bytes from the subsequent data are processed as barcode data.
- (2) If n is out of the defined range, command processing will be aborted, and the subsequent data will be processed as normal data.

[In standard mode]

- (1) If d is out of the defined range, only paper feed will be performed, and the subsequent data will be processed as normal data.
- (2) If the width of a barcode exceeds the print area per line, it will not be guaranteed that the barcode is printed properly.
- (3) Paper will be fed over the length equivalent to the height of a barcode (including HRI characters if HRI character printing is specified), regardless of a line feed length defined by the 30-dot Line Feed Length Set Command ([ESC] 2) or Minimum Dots for Line Feed Length Set Command ([ESC] 3).
- (4) This command will be valid only if no data is present in the print buffer. If data is present in the print buffer, the data subsequent to m will be processed as normal data.
- (5) After a barcode is printed, the next print position is the beginning of a line.
- (6) There is no impact upon print modes (bold printing, double printing, underlining, and character size) except for inverted printing.

[In page mode]

- (1) A barcode is expanded, but not printed. After the expansion of the barcode, the dot subsequent to the final barcode data is the data expansion starting position.
- (2) If d is out of the defined range, command processing will be aborted, and the subsequent data will be processed as normal data. Note that the data expansion starting position remains unchanged.
- (3) If the width of a barcode exceeds the print area per line, it will not be guaranteed that the barcode is printed properly.

Explanation

[CODE128]

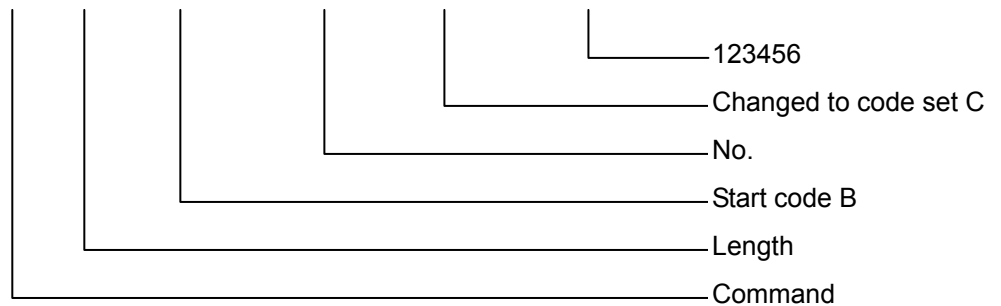
- (1) Please refer to "APPENDIX: BARCODE" for the overview of CODE 128.
- (2) When this printer is used to print a CODE128 barcode, care must be taken regarding the following points when transmitting barcode data:
  - ① The beginning of the barcode data must always be a code set (CODE A, CODE B, or CODE C), based on which the first code set is selected.
  - ② Special characters are specified by two characters: '{' followed by 1 character. Also, an ASCII character '{' is specified by transmitting 2 '{' characters in a row.

| Special character | Data to be transmitted |       |
|-------------------|------------------------|-------|
|                   | ASCII                  | Hex   |
| SHIFT             | {S                     | 7B 53 |
| CODE A            | {A                     | 7B 41 |
| CODE B            | {B                     | 7B 42 |
| CODE C            | {C                     | 7B 43 |
| FNC1              | {1                     | 7B 31 |
| FNC2              | {2                     | 7B 32 |
| FNC3              | {3                     | 7B 33 |
| FNC4              | {4                     | 7B 34 |
| '{'               | {{                     | 7B 7B |

[Example] Data to be transmitted to print "No.123456"

In this example, first, code set B is used to print "No." After that, the code set is changed to code set C, and the 6-digit number is printed.

[GS] k [49] [0A] [7B] [42] [4E] [6F] [2E] [7B] [43] [0C] [22] [38]



- (3) If the beginning of the barcode data string is not a code set, command processing will be aborted immediately, and the subsequent data will be processed as normal data.
- (4) If the combination of '{' and the following character does not match any special characters, command processing will be aborted immediately, and the subsequent data will be processed as normal data.
- (5) If a character that cannot be used with a selected code set is received, command processing will be aborted immediately, and the subsequent data will be processed as normal data.

- (6) An HRI (Human Readable Interpretation) character corresponding to a shift character and code set character is not printed.
- (7) An HRI character for a function character is space.
- (8) An HRI character for a control character (00H to 1FH and 7FH) is space.

[CODE93]

The B-EP series does not support the following functions:

- (1) An HRI character for a start character (□) is printed at the beginning of the HRI character string.
- (2) An HRI character for a stop character (□) is printed at the end of the HRI character string.
- (3) An HRI character for a control character (00H to 1FH and 7FH) is printed with ■ and an alphabet combined.

| Control character |     | HRI character | Control character |     | HRI character |
|-------------------|-----|---------------|-------------------|-----|---------------|
| ASCII             | Hex |               | ASCII             | Hex |               |
| NUL               | 00  | ■U            | DLE               | 10  | ■P            |
| SOH               | 01  | ■A            | DC1               | 11  | ■Q            |
| STX               | 02  | ■B            | DC2               | 12  | ■R            |
| ETX               | 03  | ■C            | DC3               | 13  | ■S            |
| EOT               | 04  | ■D            | DC4               | 14  | ■T            |
| ENQ               | 05  | ■E            | NAK               | 15  | ■U            |
| ACK               | 06  | ■F            | SYN               | 16  | ■V            |
| BEL               | 07  | ■G            | ETB               | 17  | ■W            |
| BS                | 08  | ■H            | CAN               | 18  | ■X            |
| HT                | 09  | ■I            | EM                | 19  | ■Y            |
| LF                | 0A  | ■J            | SUB               | 1A  | ■Z            |
| VT                | 0B  | ■K            | ESC               | 1B  | ■A            |
| FF                | 0C  | ■L            | FS                | 1C  | ■B            |
| CR                | 0D  | ■M            | GS                | 1D  | ■C            |
| SO                | 0E  | ■N            | RS                | 1E  | ■D            |
| SI                | 0F  | ■O            | US                | 1F  | ■E            |
|                   |     |               | DEL               | 7F  | ■T            |

Reference

- HRI Character Print Position Set Command ([GS] H)
- Barcode Height Set Command ([GS] h)
- Barcode Width Set Command ([GS] w)

## 8.10.48 APPENDIX: BARCODE

### 8.10.48.1 CODE128

Code set A: ASCII characters ranging between 00H and 5FH can be represented.

Code set B: ASCII characters ranging between 20H and 7FH can be represented.

Code set C: Two digits can be represented using 1 character.

In addition to the above characters, CODE128 has the following special characters:

- Shift character (SHIFT)

In code set A, a character immediately after SHIFT is treated as a character of code set B. In code set B, a character immediately after SHIFT is treated as a character of code set A. Note that SHIFT cannot be used in code set C.

- Code set character (CODEA, CODEB, CODEC)

The code set subsequent to a code set character is changed to A, B, or C.

- Function character (FNC1, FNC2, FNC3, FNC4)

Uses of the function character vary depending on the application. Note that only FNC1 can be used in code set C.

[Characters printable with code set A]

| Char | Data to be transmitted |
|------|------------------------|
| NUL  | 00                     |
| SOH  | 01                     |
| STX  | 02                     |
| ETX  | 03                     |
| EOT  | 04                     |
| ENQ  | 05                     |
| ACK  | 06                     |
| BEL  | 07                     |
| BS   | 08                     |
| HT   | 09                     |
| LF   | 0A                     |
| VT   | 0B                     |
| FF   | 0C                     |
| CR   | 0D                     |
| SO   | 0E                     |
| SI   | 0F                     |
| DLE  | 10                     |
| DC1  | 11                     |
| DC2  | 12                     |
| DC3  | 13                     |
| DC4  | 14                     |
| NAK  | 15                     |
| SYN  | 16                     |
| ETB  | 17                     |

| Char | Data to be transmitted |
|------|------------------------|
| CAN  | 18                     |
| EM   | 19                     |
| SUB  | 1A                     |
| ESC  | 1B                     |
| FS   | 1C                     |
| GS   | 1D                     |
| RS   | 1E                     |
| US   | 1F                     |
| SP   | 20                     |
| !    | 21                     |
| "    | 22                     |
| #    | 23                     |
| \$   | 24                     |
| %    | 25                     |
| &    | 26                     |
| '    | 27                     |
| (    | 28                     |
| )    | 29                     |
| *    | 2A                     |
| +    | 2B                     |
| ,    | 2C                     |
| -    | 2D                     |
| .    | 2E                     |
| /    | 2F                     |

| Char | Data to be transmitted |
|------|------------------------|
| 0    | 30                     |
| 1    | 31                     |
| 2    | 32                     |
| 3    | 33                     |
| 4    | 34                     |
| 5    | 35                     |
| 6    | 36                     |
| 7    | 37                     |
| 8    | 38                     |
| 9    | 39                     |
| :    | 3A                     |
| ;    | 3B                     |
| <    | 3C                     |
| =    | 3D                     |
| >    | 3E                     |
| ?    | 3F                     |
| @    | 40                     |
| A    | 41                     |
| B    | 42                     |
| C    | 43                     |
| D    | 44                     |
| E    | 45                     |
| F    | 46                     |
| G    | 47                     |

| Char | Data to be transmitted |
|------|------------------------|
| H    | 48                     |
| I    | 49                     |
| J    | 4A                     |
| K    | 4B                     |
| L    | 4C                     |
| M    | 4D                     |
| N    | 4E                     |
| O    | 4F                     |
| P    | 50                     |
| Q    | 51                     |
| R    | 52                     |
| S    | 53                     |
| T    | 54                     |
| U    | 55                     |
| V    | 56                     |
| W    | 57                     |
| X    | 58                     |
| Y    | 59                     |
| Z    | 5A                     |
| [    | 5B                     |
| \    | 5C                     |
| ]    | 5D                     |
| ~    | 5E                     |
| _    | 5F                     |

| Char  | Data to be transmitted |
|-------|------------------------|
| FNC1  | 7B 31                  |
| FNC2  | 7B 32                  |
| FNC3  | 7B 33                  |
| FNC4  | 7B 34                  |
| SHIFT | 7B 35                  |
| CODEB | 7B 42                  |
| CODEC | 7B 43                  |

[Characters printable with code set B]

| Char | Data to be transmitted |
|------|------------------------|
| SP   | 20                     |
| !    | 21                     |
| "    | 22                     |
| #    | 23                     |
| \$   | 24                     |
| %    | 25                     |
| &    | 26                     |
| '    | 27                     |
| (    | 28                     |
| )    | 29                     |
| *    | 2A                     |
| +    | 2B                     |
| ,    | 2C                     |
| -    | 2D                     |
| .    | 2E                     |
| /    | 2F                     |
| 0    | 30                     |
| 1    | 31                     |
| 2    | 32                     |
| 3    | 33                     |
| 4    | 34                     |
| 5    | 35                     |
| 6    | 36                     |
| 7    | 37                     |

| Char | Data to be transmitted |
|------|------------------------|
| 8    | 38                     |
| 9    | 39                     |
| :    | 3A                     |
| ;    | 3B                     |
| <    | 3C                     |
| =    | 3D                     |
| >    | 3E                     |
| ?    | 3F                     |
| @    | 40                     |
| A    | 41                     |
| B    | 42                     |
| C    | 43                     |
| D    | 44                     |
| E    | 45                     |
| F    | 46                     |
| G    | 47                     |
| H    | 48                     |
| I    | 49                     |
| J    | 4A                     |
| K    | 4B                     |
| L    | 4C                     |
| M    | 4D                     |
| N    | 4E                     |
| O    | 4F                     |

| Char | Data to be transmitted |
|------|------------------------|
| P    | 50                     |
| Q    | 51                     |
| R    | 52                     |
| S    | 53                     |
| T    | 54                     |
| U    | 55                     |
| V    | 56                     |
| W    | 57                     |
| X    | 58                     |
| Y    | 59                     |
| Z    | 5A                     |
| [    | 5B                     |
| \    | 5C                     |
| ]    | 5D                     |
| ~    | 5E                     |
| `    | 5F                     |
| ˆ    | 60                     |
| a    | 61                     |
| b    | 62                     |
| c    | 63                     |
| d    | 64                     |
| e    | 65                     |
| f    | 66                     |
| g    | 67                     |

| Char | Data to be transmitted |
|------|------------------------|
| h    | 68                     |
| i    | 69                     |
| j    | 6A                     |
| k    | 6B                     |
| l    | 6C                     |
| m    | 6D                     |
| n    | 6E                     |
| o    | 6F                     |
| p    | 70                     |
| q    | 71                     |
| r    | 72                     |
| s    | 73                     |
| t    | 74                     |
| u    | 75                     |
| v    | 76                     |
| w    | 77                     |
| x    | 78                     |
| y    | 79                     |
| z    | 7A                     |
| {    | 7B                     |
|      | 7C                     |
| }    | 7D                     |
| ~    | 7E                     |
| DEL  | 7F                     |

| Char  | Data to be transmitted |
|-------|------------------------|
| FNC1  | 7B 31                  |
| FNC2  | 7B 32                  |
| FNC3  | 7B 33                  |
| FNC4  | 7B 34                  |
| SHIFT | 7B 53                  |
| CODEA | 7B 41                  |
| CODEC | 7B 43                  |

[Characters printable with code set C]

| Char | Data to be transmitted |
|------|------------------------|
| 00   | 00                     |
| 01   | 01                     |
| 02   | 02                     |
| 03   | 03                     |
| 04   | 04                     |
| 05   | 05                     |
| 06   | 06                     |
| 07   | 07                     |
| 08   | 08                     |
| 09   | 09                     |
| 10   | 0A                     |
| 11   | 0B                     |
| 12   | 0C                     |
| 13   | 0D                     |
| 14   | 0E                     |
| 15   | 0F                     |
| 16   | 10                     |
| 17   | 11                     |
| 18   | 12                     |
| 19   | 13                     |
| 20   | 14                     |
| 21   | 15                     |
| 22   | 16                     |
| 23   | 17                     |

| Char | Data to be transmitted |
|------|------------------------|
| 24   | 18                     |
| 25   | 19                     |
| 26   | 1A                     |
| 27   | 1B                     |
| 28   | 1C                     |
| 29   | 1D                     |
| 30   | 1E                     |
| 31   | 1F                     |
| 32   | 20                     |
| 33   | 21                     |
| 34   | 22                     |
| 35   | 23                     |
| 36   | 24                     |
| 37   | 25                     |
| 38   | 26                     |
| 39   | 27                     |
| 40   | 28                     |
| 41   | 29                     |
| 42   | 2A                     |
| 43   | 2B                     |
| 44   | 2C                     |
| 45   | 2D                     |
| 46   | 2E                     |
| 47   | 2F                     |

| Char | Data to be transmitted |
|------|------------------------|
| 48   | 30                     |
| 49   | 31                     |
| 50   | 32                     |
| 51   | 33                     |
| 52   | 34                     |
| 53   | 35                     |
| 54   | 36                     |
| 55   | 37                     |
| 56   | 38                     |
| 57   | 39                     |
| 58   | 3A                     |
| 59   | 3B                     |
| 60   | 3C                     |
| 61   | 3D                     |
| 62   | 3E                     |
| 63   | 3F                     |
| 64   | 40                     |
| 65   | 41                     |
| 66   | 42                     |
| 67   | 43                     |
| 68   | 44                     |
| 69   | 45                     |
| 70   | 46                     |
| 71   | 47                     |

| Char | Data to be transmitted |
|------|------------------------|
| 72   | 48                     |
| 73   | 49                     |
| 74   | 4A                     |
| 75   | 4B                     |
| 76   | 4C                     |
| 77   | 4D                     |
| 78   | 4E                     |
| 79   | 4F                     |
| 80   | 50                     |
| 81   | 51                     |
| 82   | 52                     |
| 83   | 53                     |
| 84   | 54                     |
| 85   | 55                     |
| 86   | 56                     |
| 87   | 57                     |
| 88   | 58                     |
| 89   | 59                     |
| 90   | 5A                     |
| 91   | 5B                     |
| 92   | 5C                     |
| 93   | 5D                     |
| 94   | 5E                     |
| 95   | 5F                     |

| Char  | Data to be transmitted |
|-------|------------------------|
| 96    | 60                     |
| 97    | 61                     |
| 98    | 62                     |
| 99    | 63                     |
| FNC1  | 7B 31                  |
| CODEA | 7B 41                  |
| CODEB | 7B 42                  |

**8.10.48.2 UPC-E**

Conversion to UPC-E is performed as shown by the tables below.

| UPC-E (7 digit) version |    |    |    |    |    |          |    |
|-------------------------|----|----|----|----|----|----------|----|
| P1                      | P2 | P3 | P4 | P5 | P6 | P7       | P8 |
| 0                       | X1 | X2 | Y1 | Y2 | Y3 | <b>0</b> | CD |
| 0                       | X1 | X2 | Y1 | Y2 | Y3 | <b>1</b> | CD |
| 0                       | X1 | X2 | Y1 | Y2 | Y3 | <b>2</b> | CD |
| 0                       | X1 | X2 | X3 | Y1 | Y2 | 3        | CD |
| 0                       | X1 | X2 | X3 | X4 | Y1 | 4        | CD |
| 0                       | X1 | X2 | X3 | X4 | X5 | Y1       | CD |

| UPC-A (12 digit) version |    |    |          |          |          |          |          |          |          |     |     |
|--------------------------|----|----|----------|----------|----------|----------|----------|----------|----------|-----|-----|
| A1                       | A2 | A3 | A4       | A5       | A6       | A7       | A8       | A9       | A10      | A11 | A12 |
| 0                        | X1 | X2 | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | Y1       | Y2       | Y3  | CD  |
| 0                        | X1 | X2 | <b>1</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | Y1       | Y2       | Y3  | CD  |
| 0                        | X1 | X2 | <b>2</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | Y1       | Y2       | Y3  | CD  |
| 0                        | X1 | X2 | X3       | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | Y1       | Y2  | CD  |
| 0                        | X1 | X2 | X3       | X4       | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | Y1  | CD  |
| 0                        | X1 | X2 | X3       | X4       | X5       | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> | Y1  | CD  |

- Data check is performed for the “0” portion (shaded in the right table) to categorize the data into 4 patterns from ① to ④. If the data does not match the 4 patterns, command processing will be aborted.
- The data categorized into the 4 patterns from ① to ④ is converted, as shown by the left table.
- A4 data in pattern ① accepts only 0, 1, or 2. However, the printer does not perform any data integrity check. Therefore, a barcode will be printed even if any value other than 0 to 2 is specified for A4 (P7) data.

**8.10.49 BARCODE HORIZONTAL SIZE COMMAND**

**[GS] w**

**Function** Sets the horizontal size of the barcode.

**Format** [GS] wn

**Term** ASCII: GS w  
Hex: 1Dh 77h

[Parameter]

n: Horizontal size of the barcode  
 $2 \leq n \leq 15$  ( $02h \leq n \leq 0Fh$ )

**Default value** n: 3

**Explanation** The maximum value varies depending on model and barcode type.

|                                          | Model         | B-EP2DL-GHxx | B-EP4DL-GHxx |
|------------------------------------------|---------------|--------------|--------------|
|                                          | Range         | 02H to 05H   | 02H to 0AH   |
|                                          | Initial value | 03H          | 03H          |
| UPC-A, UPC-E,<br>JAN13, JAN8,<br>CODE128 | Maximum value | 03H          | 06H          |
| CODE39<br>Interleaved 2 of 5,<br>NW-7    | Maximum value | 05H          | 0AH          |

[UPC-A, UPC-E, JAN13, JAN8, or CODE128]

| n   | 1 module |       | 2 modules |       | 3 modules |       | 4 modules |       |
|-----|----------|-------|-----------|-------|-----------|-------|-----------|-------|
|     | Bar      | Space | Bar       | Space | Bar       | Space | Bar       | Space |
| 02H | 2        |       | 4         |       | 6         |       | 8         |       |
| 03H | 3        |       | 6         |       | 9         |       | 12        |       |
| 04H | 4        |       | 8         |       | 12        |       | 16        |       |
| 05H | 5        |       | 10        |       | 15        |       | 20        |       |
| 06H | 6        |       | 12        |       | 18        |       | 24        |       |
| 07H | 7        |       | 14        |       | 21        |       | 28        |       |
| 08H | 8        |       | 16        |       | 24        |       | 32        |       |
| 09H | 9        |       | 18        |       | 27        |       | 36        |       |

(Unit: dot)

[CODE39, Interleaved 2 of 5, or NW-7]

| n   | Narrow |       | Wide |       | Character-to-character space |
|-----|--------|-------|------|-------|------------------------------|
|     | Bar    | Space | Bar  | Space |                              |
| 02H | 2      | 2     | 5    | 5     | 2                            |
| 03H | 2      | 2     | 6    | 6     | 2                            |
| 04H | 3      | 3     | 8    | 8     | 3                            |
| 05H | 3      | 3     | 9    | 9     | 3                            |
| 06H | 4      | 4     | 11   | 11    | 4                            |
| 07H | 4      | 4     | 12   | 12    | 4                            |
| 08H | 5      | 5     | 14   | 14    | 5                            |
| 09H | 5      | 5     | 15   | 15    | 5                            |
| 0AH | 6      | 6     | 17   | 17    | 6                            |
| 0BH | 6      | 6     | 18   | 18    | 6                            |
| 0CH | 7      | 7     | 20   | 20    | 7                            |
| 0DH | 7      | 7     | 21   | 21    | 7                            |
| 0EH | 8      | 8     | 23   | 23    | 8                            |
| 0FH | 8      | 8     | 24   | 24    | 8                            |

(Unit: dot)

\* The character-to-character space does not exist in Interleaved 2 of 5.

(1) A multilevel barcode refers to the following barcode system:

UPC-A, UPC-E, JAN13, JAN8, CODE93, and CODE128

(2) A 2-level barcode refers to the following barcode system:

CODE39, ITF, and NW-7

(3) If "n" is out of range, this command will be ignored.

Reference

Barcode Print Command ([GS] k)



### 8.10.50 BARCODE HEIGHT COMMAND

[GS] h

**Function** Sets the barcode height.

**Format** [GS] hn

**Term** ASCII: GS h  
Hex: 1Dh 68h

[Parameter]  
n: No. of dots for the barcode height  
 $1 \leq n \leq 255$  (01h  $\leq$  n  $\leq$  FFh)

**Default value** n: 162

**Explanation** (1) When “n” is set to any value other than the above, this command will be ignored.

**Reference** Barcode Print Command ([GS] k)

### 8.10.51 NUMERALS UNDER BARS COMMAND

**[GS] H**

**Function** Specifies a print position of an HRI character when a barcode is printed.

**Format** [GS] Hn

**Term** ASCII: GS H  
Hex: 1Dh 48h

[Parameter]

n: Print position of HRI character     $0 \leq n \leq 3$  ( $00h \leq n \leq 03h$ )  
or  
 $48 \leq n \leq 50$  ( $30h \leq n \leq 33h$ )

- 0: Not printing
- 1: Above barcode
- 2: Below barcode
- 3: Above and below barcode

**Default value** n: 0

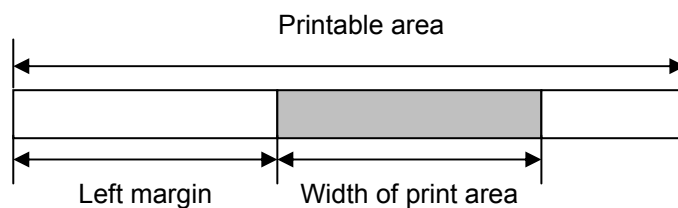
**Explanation** (1) HRI stands for Human Readable Interpretation.

**Reference** Barcode Print Command ([GS] k)

### 8.10.52 PRINT AREA WIDTH SET COMMAND

[GS] W

|          |                                                                                                                                                                                                            |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Specifies the width of the print area defined by nL and nH.<br>The width of the print area is determined by [(nL + nH × 256) dots].                                                                        |
| Format   | [GS] WnLnH                                                                                                                                                                                                 |
| Term     | ASCII: GS W<br>Hex: 1Dh 57h<br><br>[Parameter]<br>nL: Width of print area                      0 ≤ nL ≤ 255 (00h ≤ nL ≤ FFh)<br>nH: Width of print area                      0 ≤ nH ≤ 255 (00h ≤ nH ≤ FFh) |



|               |                                                                                         |
|---------------|-----------------------------------------------------------------------------------------|
| Default value | 384 dots (nL = 128, nH = 1) (B-EP2DL-GHxx)<br>832 dots (nL = 64, nH = 3) (B-EP4DL-GHxx) |
|---------------|-----------------------------------------------------------------------------------------|

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | <ol style="list-style-type: none"> <li>(1) This command will be executed only if received at the beginning of a line.</li> <li>(2) If this command is received while the printer is in page mode, the defined parameter setting will be applied after switching to standard mode.</li> <li>(3) The command settings do not have any impacts upon page mode.</li> <li>(4) If a value beyond the printable area per line is inputted, all area except for the left margin will be specified as a print area.</li> <li>(5) If a value specified for the width of the print area is smaller than the width of a character to be printed, printing will only be performed by up to the specified width of the print area.</li> <li>(6) If the width of the print area is set to 0 ([GS] W [00] [00]), printing will start from the left edge of the printable area.</li> </ol> |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|           |                                  |
|-----------|----------------------------------|
| Reference | Left Margin Set Command ([GS] L) |
|-----------|----------------------------------|

**8.10.53 DOWNLOADED BIT IMAGE DEFINE COMMAND [GS] \***

**Function** Defines a downloaded bit image that contains the number of dots specified by n1 and n2.

**Format** [GS] \*n1n2 [d<sub>1</sub>d<sub>2</sub>d<sub>3</sub>...d<sub>(n1×n2×8)</sub>]

**Term** ASCII: GS \*  
Hex: 1Dh 2Ah

**[Parameter]**

n1: No. of dots in the horizontal direction (n1 × 8) 1 ≤ n1 ≤ 255 (01h ≤ n1 ≤ FFh)

n2: No. of dots in the vertical direction (n2 × 8) 1 ≤ n2 ≤ 48 (01h ≤ n2 ≤ 30h)

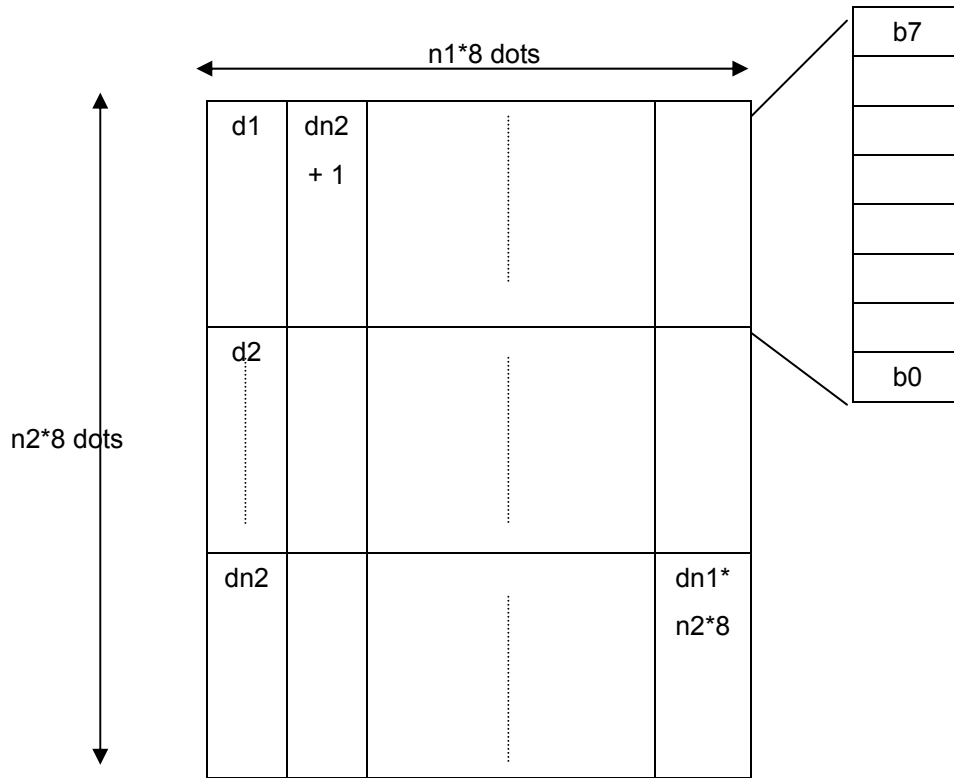
\* n1 × n2 ≤ 1,536

d: Image data 1 ≤ d ≤ 255 (01h ≤ d ≤ FFh)

\* 1 refers to a bit to be printed, and 0 to the one not to be printed.

**Default value**

- Explanation**
- (1) If n1 × n2 is out of the defined range, this command will be ignored.
  - (2) d refers to bit image data. A bit corresponding to a dot to be printed is set to 1, and the one corresponding to a dot not to be printed is set to 0.
  - (3) The defined downloaded bit image is cleared in the event of:
    - Initialize Command ([ESC] @)
    - Downloaded Character (Writable Character) Define Command ([ESC] &)
    - Resetting or turning the printer off
  - (4) A downloaded bit image is defined.
  - (5) A specified logo is valid until resetting or the printer is turned off. However, in the event of a parameter error (e.g. a value out of range), the most recently stored logo is not guaranteed.
  - (6) At a moment when an error occurs with parameter n1 or n2 due to a factor such as an unmatched condition, command processing will be aborted, and the data subsequent to n2 will be processed as normal data.
  - (7) This command is valid in page mode only when the parameter of the Page Mode Print Direction Set Command ([ESC] T) is set to 0 (0-degree rotation). The bit image will not be rotated if any value other than 0 is specified.
  - (8) The figure on the next page illustrates a relationship between data and printed dots.



Reference

Downloaded Bit image Print Mode Set Command ([GS] /)

### 8.10.54 DOWNLOADED BIT IMAGE PRINT MODE SET COMMAND [GS] /

**Function** Prints a logo (image data) specified by n in mode specified by k

**Format** [GS] /m

**Term** ASCII: GS /  
Hex: 1Dh 2Fh

[Parameter]

m: Downloaded bit image data print mode  $0 \leq m \leq 3$  ( $00h \leq m \leq 03h$ )

or

$48 \leq m \leq 51$  ( $30h \leq m \leq 33h$ )

|      |                    |
|------|--------------------|
| 0,48 | Normal mode        |
| 1,49 | Double-width mode  |
| 2,50 | Double-height mode |
| 3,51 | Quadruple mode     |

- Explanation**
- (1) Unless downloaded bit image data is defined, this command will be ignored.
  - (2) When standard mode is selected, the command will be valid only if no data is present in the print buffer.
  - (3) Inverted printing, bold printing, double printing, underlining, character size, or reversed printing will become invalid even if specified.
  - (4) If there is a line where the print area specified by the Left Margin Set Command ([GS] L) or Print Area Width Set Command ([GS] W) does not reach the minimum width in bit image mode (1 dot in normal or double-height mode, or 2 dots in double-width or quadruple mode), the print area will be extended to the right until it reaches the minimum width in bit image mode to the extent that the printable area is not exceeded. This only applies to such a line.

**Reference** Downloaded Bit image Define Command ([GS] \*)

**8.10.55 MACRO DEFINITION START/END COMMAND [GS] :**

Function

Specifies the start or end of a macro.

Format

[GS] :

Term

ASCII: GS :  
Hex: 1Dh 3Ah

Explanation

- (1) If this command is included under normal operation, the start of a macro definition will be specified. If this command is included while a macro is being defined, the end of the macro definition will be specified.
- (2) If the Macro Execute Command ([GS] ^) is included while the macro is being defined, the macro definition will be aborted, and cleared.
- (3) A macro is "undefined" initially.
- (4) Undefined items are not cleared by the Initialize Command ([ESC] @).
- (5) If [GS] : is included immediately after the receipt of this command, a macro will become "undefined."
- (6) The maximum permissible number of bytes for a macro definition will be limited to 2,048, even if it exceeds 2,048.

Reference

Macro Execute Command ([GS] ^)

### 8.10.56 MACRO EXECUTE COMMAND

[GS] ^

**Function** Executes a defined macro.

**Format** [GS] ^n1n2n3

**Term** ASCII: GS ^  
Hex: 1Dh 5Eh

**[Parameter]**

n1: No. of times macro is executed  $0 \leq n1 \leq 255$  (00h  $\leq$  n1  $\leq$  FFh)

n2: Waiting time when macro is executed  $0 \leq n2 \leq 255$  (00h  $\leq$  n2  $\leq$  FFh)

Waiting time of  $n2 \times 100$  msec every time a macro is executed

n3: Mode to execute a macro  $0 \leq n3 \leq 1$  (00h  $\leq$  n3  $\leq$  01h)

0: A macro is executed n1 times at interval of time specified by n2.

1: After a lapse of time specified by n2, the STATUS LED (green) blinks and waits for the [FEED] key to be pressed. Once the [FEED] key is pressed, a macro is executed once. This is repeated n1 times.

**Explanation** (1) If this command is included while the macro is being defined, the macro definition will be aborted, and cleared.

(2) Nothing will be done with no macro defined or with  $n1 = 0$ .

(3) The [FEED] key is inoperable during the specified waiting time when a macro is executed.

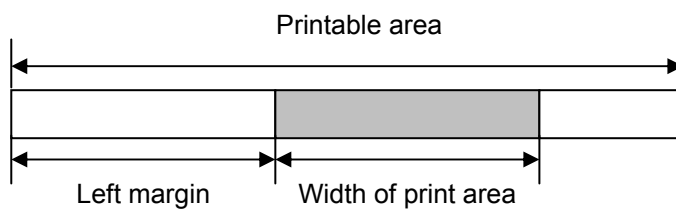
**Reference** Macro Definition Start/End Command ([GS] :)



**8.10.58 LEFT MARGIN SET COMMAND**

**[GS] L**

|          |                                                                                                                                   |                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Function | Sets the left margin as specified by nL and nH.<br>The left margin is determined by $[(nL + nH \times 256) \times \text{dots}]$ . |                                                 |
| Format   | [GS] LnLnH                                                                                                                        |                                                 |
| Term     | ASCII: GS L<br>Hex: 1Dh 4Ch                                                                                                       |                                                 |
|          | [Parameter]                                                                                                                       |                                                 |
|          | nL: Width of print area                                                                                                           | $0 \leq nL \leq 255$ (00h $\leq$ nL $\leq$ FFh) |
|          | nH: Width of print area                                                                                                           | $0 \leq nH \leq 255$ (00h $\leq$ nH $\leq$ FFh) |



**Default value** nL = 0, nH = 0

- Explanation**
- (1) This command will be valid only if received at the beginning of a line.
  - (2) If this command is received while the printer is in page mode, the defined parameter setting will be applied after switching to standard mode.
  - (3) The command settings do not have any impacts upon page mode.
  - (4) The maximum permissible left margin is equal to the width of the printable area. If a specified value exceeds the maximum value, it will be rounded to the maximum value.

**Reference** Print Area Width Set Command ([GS] W)

**8.10.59 CHARACTER SIZE SET COMMAND**

**[GS] !**

**Function** Specifies a character size (magnification in the vertical / horizontal direction).

**Format** [GS] !n

**Term** ASCII: GS !  
Hex: 1Dh 21h

[Parameter]

n: Specifying a character size  $1 \leq n \leq 255$  ( $00h \leq n \leq FFh$ )

\*  $1 \leq$  Magnification in vertical direction  $\leq 8$ ,  $1 \leq$  Magnification in horizontal direction  $\leq 8$

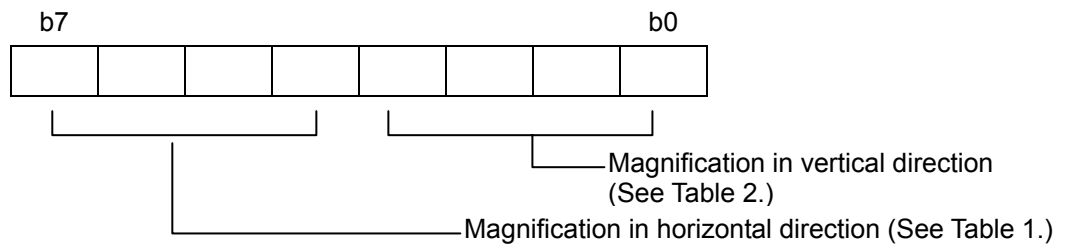


Table 1 [Magnification in horizontal direction]

| 1-byte data (hex) | Magnification      |
|-------------------|--------------------|
| 00                | x 1 (standard)     |
| 10                | x 2 (double width) |
| 20                | x 3                |
| 30                | x 4                |
| 40                | x 5                |
| 50                | x 6                |
| 60                | x 7                |
| 70                | x 8                |

Table 2 [Magnification in vertical direction]

| 1-byte data (hex) | Magnification       |
|-------------------|---------------------|
| 00                | x 1 (standard)      |
| 01                | x 2 (double height) |
| 02                | x 3                 |
| 03                | x 4                 |
| 04                | x 5                 |
| 05                | x 6                 |
| 06                | x 7                 |
| 07                | x 8                 |

**Default value** n: 0

**Example** A magnification in the horizontal direction is x 3, and a magnification in the vertical direction is x 6.

The command is [GS] ! [25].

- Explanation**
- (1) This parameter setting applies to all characters (ANK and Chinese characters) except for HRI characters.
  - (2) If either a specified magnification in the vertical or horizontal direction is out of the defined range, this command will be ignored.
  - (3) In standard mode, "vertical direction" refers to the paper feed direction, and "horizontal direction" to the direction perpendicular to the paper feed direction. Therefore, if 90-degree rotation is specified, this relationship will be reversed.
  - (4) In page mode, "vertical direction" refers to the vertical direction of a character, and the horizontal direction to the width.
  - (5) Double width and double height can be set or canceled by the Print Mode All Set Command ([ESC] !). But the most recently processed command is applied.

**Reference** Print Mode All Set Command ([ESC] !)

## 8.11 TEC ORIGINAL COMMANDS

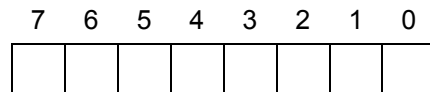
### 8.11.1 MODE SELECT COMMAND

[ESC] M

**Function** Changes the print mode.

**Format** [ESC] M; a (,b) [LF] [NUL]

**Term** a: Print mode designation



Print mode (Bit 0 to Bit 6 \* See Table 1.)

Automatic status response in IrDA: IrCOMM or USB

0: Not performed

1: Performed

\* Table 1 Print mode

| HEX | Mode     | How to deal with the received data after an error is cleared |
|-----|----------|--------------------------------------------------------------|
| 30H | LABEL    | Discards                                                     |
| 31H | RECEIPT  | Discards                                                     |
| 32H | RECEIPT1 | Continues printing                                           |
| 34H | ESC/POS  | Continues printing                                           |
| 41H | TPCL     | Continues printing                                           |
| 42H | TPCL1    | Continues printing                                           |

b: Print position detection feed (Omissible. If omitted, the print position detection feed is not performed.)

0: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is not performed after the mode is changed.

1: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is performed after the mode is changed.

Explanation

- (1) There are 4 types of the print mode: "LABEL," "RECEIPT," "TPCL" and "ESC/POS."
- (2) "Automatic status response in IrDA: IrCOMM" or USB is the function for the specifications which do not allow the printer to spontaneously send the status through IrDA; IrCOMM or USB. This function enables the printer to forcefully send the status to the host, if the link between the printer and the host is established. However, if the link between the printer and the host is not established upon the status transmission, the printer cannot send the status. Therefore, the status is discarded. (In the next connection to the host, the printer does not send the status to the host.)
- (3) The sensor is not used in the RECEIPT, RECEIPT1 or ESC/POS mode. When sensor detectable paper is used for receipts and labels, print position detection feed cannot be done in the LABEL, TPCL or TPCL1 mode. By setting the print position detection feed parameter to 1, print position detection feed is carried out after the mode is changed to LABEL, TPCL or TPCL1.
- (4) In the TPCL1 mode, it is possible to re-print the last print data by pressing the FEED button.

Notes

- (1) The print mode designation (the specified print mode and the automatic status response in IrDA: IrCOMM or USB) is backed up in memory (retained even if the power is turned off).
- (2) The factory default is "TPCL mode" and "Automatic status response in IrDA: IrCOMM or USB is not performed." (The IrDA protocol is "IrCOMM.")
- (3) When the print mode is changed, the type of sensor is automatically changed.
 

|                    |                                                |
|--------------------|------------------------------------------------|
| LABEL mode (0):    | The previously backed up sensor is designated. |
| TPCL mode (A):     | The previously backed up sensor is designated. |
| TPCL1 mode (B):    | The previously backed up sensor is designated. |
| RECEIPT mode (1):  | No sensor is designated.                       |
| RECEIPT1 mode (2): | No sensor is designated.                       |
| ESC/POS mode (4):  | No sensor is designated.                       |
- (4) If the RECEIPT or ESC/POS mode is selected or no sensor is designated in the LABEL or TPCL mode, an initial feed is not performed when the cover is closed (when the key operation or Set Command ([ESC] ZM03) is used to enable the print position detection feed setting after closing the cover.)
- (5) When the mode change is finished, the printer sends the normal end status or an ACK to the host. However, when the mode is changed to the TPCL mode, the printer does not send the status. In IrDA: IrCOMM or USB, only when bit 7 of the print mode designation is set to "1," the printer sends the status.

- (6) The print mode can be changed by the printer itself. However, since the setting for the automatic status response in IrDA: IrCOMM or USB cannot be changed, the setting remains as the same.
- (7) As the print position detection feed parameter is effective only when changing the print mode to LABEL or TPCL, this parameter status will be ignored when changing the mode to RECEIPT, RECEIPT1 or ESC/POS.
- (8) The print position detection feed is performed according to the conditions, such as, label pitch, fine adjustment, and sensor selection, which were set in the LABEL or TPCL mode before the printer is operated in the RECEIPT, RECEIPT1 or ESC/POS mode. If no sensor is selected, the print position detection feed will not be performed.
- (9) After performing a print position detection feed, the printer does not send a process end status. If an error occurs during the print position detection feed, the print position detection feed is performed after the error is cleared by using the PAUSE key (when the key operation or Set Command ([ESC] ZM03) is used to enable the print position detection feed setting after closing the cover.)
- (10) When changing the print mode by the printer itself, the print position detection feed parameter cannot be set.
- (11) When the mode select command is designated with the print position detection feed at the end of a print data issued in the RECEIPT1 or ESC/POS mode, and if an error occurs while printing, the printing will restart after the error is cleared and then, the print mode will be changed to the LABEL or TPCL mode and a print position detection feed is performed. When the print position detection feed is omitted, the print mode will not be changed to the LABEL or TPCL mode. (The mode select command is discarded.)
- (12) When the LABEL or TPCL mode is selected in the mode select command and the print position detection feed parameter is set 0 (not performed), and if an error occurs while the printer issues in the RECEIPT1 or ESC/POS mode, the print mode is changed to the LABEL or TPCL mode after the error is cleared. (The mode select command is executed.)

### 8.11.2 RESET COMMAND

**[ESC] WR**

**Function** Returns the printer to its initial state.

**Format** [ESC] WR [LF] [NUL]

**Explanation**

- (1) The printer is returned to the same state as when the power is turned on.
- (2) When the printer receives this command during printing, it is initialized after issuing the label which is being printed.
- (3) After the Reset Command is sent (or after printing is completed, if printing is performed when the Reset Command is sent), the next command must not be sent within 30 seconds by the wireless LAN model or within 5 seconds by other models, because the printer is initialized. In IrDA: TEC Protocol, if ACK/status transmission is specified by the Issue Command, the printer returns an ACK, which indicates the command process end, to the EOT after the printer is initialized. In RS-232C, when the status response is specified, the printer returns the status (34H 30H). After this status is received, the next command may be sent. In IrDA: IrCOMM, IrDA: IrOBEX, USB, Bluetooth or Wireless LAN, the printer does not return the status.
- (4) When this command is sent through the IrDA interface, only this command should be sent. After the command is sent, the link should be terminated. Even if the host does not terminate the link, the printer performs the termination process. Therefore, after initialization is completed, the host should establish the link again.
- (5) When receiving this command during data transmission, the printer is initialized after completing the transmission.

**Notes**

- (1) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the SYSTEM mode.

**Example** [ESC] WR [LF] [NUL]

8.11.3 STATUS REQUEST COMMAND

[ESC] v, [ESC] FM, [ESC] WS

**Function** Requests that the printer sends back the printer status and the battery status to the host.

**Format** [ESC] v  
[ESC] FM [LF] [NUL]  
[ESC] WS [LF] [NUL]

**Explanation** (1) When this command is received, the printer sends the printer status and battery status to the host.

- For IrDA: TEC Protocol: Data to be sent (Fixed at 27 bytes)

| STX | Printer ID |     | Version No. of each form |     |       |     | Printer status | Battery status | CRC |     |
|-----|------------|-----|--------------------------|-----|-------|-----|----------------|----------------|-----|-----|
| 02H | xxH        | xxH | V01                      | V02 | ..... | V20 | xxH            | xxH            | xxH | xxH |

- For IrDA; IrCOMM, IrDA: IrOBEX, RS-232C, USB, Bluetooth or Wireless LAN:

Data to be sent (Fixed at 5 bytes)

| STX | Printer ID |     | Printer status | Battery status |
|-----|------------|-----|----------------|----------------|
| 02H | xxH        | xxH | xxH            | xxH            |

Printer ID                    2-byte hex data (in order from High to Low)

Printer status            Printer status is indicated in 1-byte data.

- 00H: Normal state (idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken head dots error
- 07H: Thermal head excessive temperature
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Operating
- 0CH: Communication error \* For RS-232C connection only
- 0DH: Normal end + Label end (See **NOTE**.)
- 0EH: Flash ROM storage area full state
- 10H: Normal issue end
- 14H: Pause state
- 19H: Ambient temperature error
- 32H: Abnormal battery temperature
- 33H: Battery excessive temperature
- 37H: Charging error
- (38H: Bluetooth setting successfully completed) Response status for automatic status transmission
- 39H: Bluetooth setup error (including initialization error)
- 45H: Wait for battery recovery
- 46H: Wait for head temperature reduction
- 47H: Wait for motor temperature reduction
- 55H: Writable character/PC command save mode

Status in the compatible mode for the B-SP series

- 00H: Normal state (idling)
  - 01H: Cover open state
  - 02H: Command syntax error (including Ir packet error)
  - 03H: Paper jam
  - 04H: Label end
  - 05H: Cover open error
  - 06H: Broken head dots error
  - 07H: Thermal head excessive temperature  
(including ambient temperature error, abnormal battery temperature, battery excessive temperature)
  - 08H: Flash ROM write error
  - 09H: Flash ROM erase error
  - 0AH: Low battery (Print failure)
  - 0BH: Operating  
(including wait for strip, pause state, bit map writable character/PC command mode, wait for battery recovery, wait for head temperature reduction, wait for motor temperature reduction)
  - 0CH: Communication error \* For RS-232C connection only
  - 0DH: Normal end + Label end (See **NOTE**.)
  - 0EH: Flash ROM storage area full state
  - 10H: Normal issue end
  - 37H: Charging error  
(38H: Bluetooth setting successfully completed) Response status for automatic status transmission
  - 39H: Bluetooth setup error (including initialization error)
- NOTE:** 0DH (Normal issue end + Label end) is a state when the printer runs out of labels, after a label is issued.

Battery status The battery charge status is indicated in 5 levels.

(B-EP2DL)

- 01H: 7.2V or less
- 02H: 7.3V to 7.4V
- 03H: 7.5V to 7.7V
- 04H: 7.8V to 7.9V
- 05H: 8.0V to 8.4V

(B-EP4DL)

- 01H: 14.0V or less
- 02H: 14.1V to 14.6V
- 03H: 14.7V to 15.2V
- 04H: 15.3V to 15.9V
- 05H: 16.0V to 16.8V

CRC: 2-byte hex data (in order from Low to High)



### 8.11.4 RECEIVE BUFFER FREE SPACE STATUS REQUEST COMMAND [ESC] WB

**Function** Sends information on the printer status and the free space of the receive buffer to the host.

**Format** [ESC] WB [LF] [NUL]

- Explanation**
- (1) This command makes the printer send information on its status and free space of the receive buffer, regardless of the setting of the Status Response parameter.
  - (2) The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining print count of the batch currently being printed only. No remaining count of the batch waiting to be printed is transmitted.
  - (3) Free space of the receive buffer for the interface which sent this command, is returned to the host.

[IrDA: TEC Protocol] Data to be transmitted (fixed at 22 bytes)

| STX | Printer ID |     | Status | Remaining No. of labels |     |     |     | Length |     |
|-----|------------|-----|--------|-------------------------|-----|-----|-----|--------|-----|
| 02H | 3xH        | 3xH | 33H    | 3xH                     | 3xH | 3xH | 3xH | 32H    | 32H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CRC |     |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | xxH | xxH |

[IrDA: IrCOMM, IrDAIr: OBEX, USB, RS-232C, Bluetooth, Wireless LAN]

Data to be transmitted (fixed at 23 bytes)

| SOH | STX | Printer status |     | Status type | Remaining No. of labels |     |     |     | Length |     |
|-----|-----|----------------|-----|-------------|-------------------------|-----|-----|-----|--------|-----|
| 01H | 02H | 3xH            | 3xH | 33H         | 3xH                     | 3xH | 3xH | 3xH | 32H    | 33H |

| Receiving buffer space |     |     |     |     | Entire receiving buffer space |     |     |     |     | CR  | LF  |
|------------------------|-----|-----|-----|-----|-------------------------------|-----|-----|-----|-----|-----|-----|
| 3xH                    | 3xH | 3xH | 3xH | 3xH | 30H                           | 30H | 35H | 31H | 32H | 0DH | 0AH |



Notes

- (1) The status is returned only to the interface which sent this command.
- (2) The printer returns the same status, regardless of whether or not the compatible mode for the B-SP series is set.
- (3) After receiving the Status Request Command, there may be a maximum of 20-msec. delay until the printer sends a status.
- (4) At least, a 20-msec. interval must be given between the transmissions of the Status Request Command. If the next Status Request Command is transmitted within 20 msec., the printer may fail to receive it.

Example

[ESC] WB [LF] [NUL]

**8.11.5 MODE INFORMATION ACQUIRE COMMAND**

**[ESC] WX**

|             |                                                                                                                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sends the printer mode information to the host.                                                                                                                                                          |
| Format      | [ESC] WX [LF] [NUL]                                                                                                                                                                                      |
| Explanation | (1) The status when the compatible mode for the B-SP series is on differs from the status when the compatible mode is off.<br><br>(2) The mode information format to be sent to the host, is as follows: |

ESC/POS mode (Mode = 4)

[IrDA: TEC Protocol]

|     |                             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |
|     | E                           | S   | C   | /   | P   | O   | S   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |
| 02H | 45H                         | 53H | 43H | 2FH | 50H | 4FH | 53H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |                             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|     | E                           | S   | C   | /   | P   | O   | S   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |
| 02H | 45H                         | 53H | 43H | 2FH | 50H | 4FH | 53H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

The above is an example where the message is received in the ESC/POS mode (Mode = 4). In addition, the following messages are returned.

- When the compatible mode for the B-SP series is off

|                                                     |                                                             |               |
|-----------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                           | TPCL                                                        |               |
| TPCL1 mode                                          | TPCL1                                                       |               |
| LABEL mode                                          | LABEL                                                       |               |
| RECEIPT mode                                        | RECEIPT                                                     |               |
| RECEIPT1 mode                                       | RECEIPT1                                                    |               |
| ESC/POS mode                                        | ESC/POS                                                     |               |
| Online reset menu                                   | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys         | USER ■ SYSTEM                                               |               |
| SYSTEM mode for administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                     | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                     | When the password setting is off                            | SYSTEM        |
| TPCL (strip issue mode)                             | TPCL ■ (S)                                                  |               |
| TPCL1 (strip issue mode)                            | TPCL1 (S)                                                   |               |
| LABEL (strip issue mode)                            | LABEL (S)                                                   |               |

\* ■ indicates a space.

- When the compatible mode for the B-SP series is on

|                                                     |                                                             |               |
|-----------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                           | TPCL-LE                                                     |               |
| TPCL1 mode                                          | TPCL-LE1                                                    |               |
| LABEL mode                                          | LABEL                                                       |               |
| RECEIPT mode                                        | RECEIPT                                                     |               |
| RECEIPT1 mode                                       | RECEIPT1                                                    |               |
| ESC/POS mode                                        | ESC/POS                                                     |               |
| Online reset menu                                   | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys         | USER ■ SYSTEM                                               |               |
| SYSTEM mode for administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                     | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                     | When the password setting is off                            | SYSTEM        |

\* ■ indicates a space.

Example [ESC] WX [LF] [NUL]

**8.11.6 PRINTER SERIAL NUMBER ACQUIRE COMMAND [ESC] WY**

**Function** Sends the printer serial number to the host.

**Format** [ESC] WY [LF] [NUL]

**Explanation**

- (1) The format of the printer serial No. to be returned to the host is as follows.

[IrDA: TEC Protocol]

|     |                    |     |     |
|-----|--------------------|-----|-----|
| STX | Printer serial No. | CRC | CRC |
| 02H | 32 bytes           | XXH | XXH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |                    |
|-----|--------------------|
| STX | Printer serial No. |
| 02H | 32 bytes           |

When the printer serial No. is "2308M000001":

[32H][33H][30H][38H][4DH][30H][30H][30H][30H][30H][31H][00H][00H][00H][00H][00H]

2 3 0 8 M 0 0 0 0 0 0 1

[00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H]

\* The remaining bytes of 32 bytes are filled with 00H.

**Example** [ESC] WY [LF] [NUL]

**8.11.7 DEVICE ADDRESS ACQUIRE COMMAND [ESC] IT**

**Function** Reads the device address of the Bluetooth or MAC address of the wireless LAN.

**Format** [ESC] IT [LF] [NUL]

**Explanation** (1) This command reads the device address of the Bluetooth or MAC address of the wireless LAN. When using the IrDA: TEC Protocol, the following information field is placed in the information frame and sent in packets.

[Information field to be sent when IrDA: TEC Protocol is used]

|     |                                                      |     |     |
|-----|------------------------------------------------------|-----|-----|
| STX | Bluetooth device address or wireless LAN MAC address | CRC | CRC |
| 02H | 12 bytes                                             | xxH | xxH |

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN is used]

|     |                                                      |
|-----|------------------------------------------------------|
| STX | Bluetooth device address or wireless LAN MAC address |
| 02H | 12 bytes                                             |

The printer sends the following information:

Bluetooth device address: 0015b5aa0005

Wireless LAN MAC address: 000940387630

Bluetooth device address:

[30H][30H][31H][35H] [62H] [35H] [61H] [61H] [30H] [30H] [30H] [35H]  
0 0 1 5 b 5 a a 0 0 0 5

Wireless LAN MAC address:

[30H][30H][30H][39H] [34H] [30H] [33H] [38H] [37H] [36H] [33H] [30H]  
0 0 0 9 4 0 3 8 7 6 3 0



### 8.11.8 BLUETOOTH RELATED PARAMETER ACQUIRE COMMAND [ESC] WT

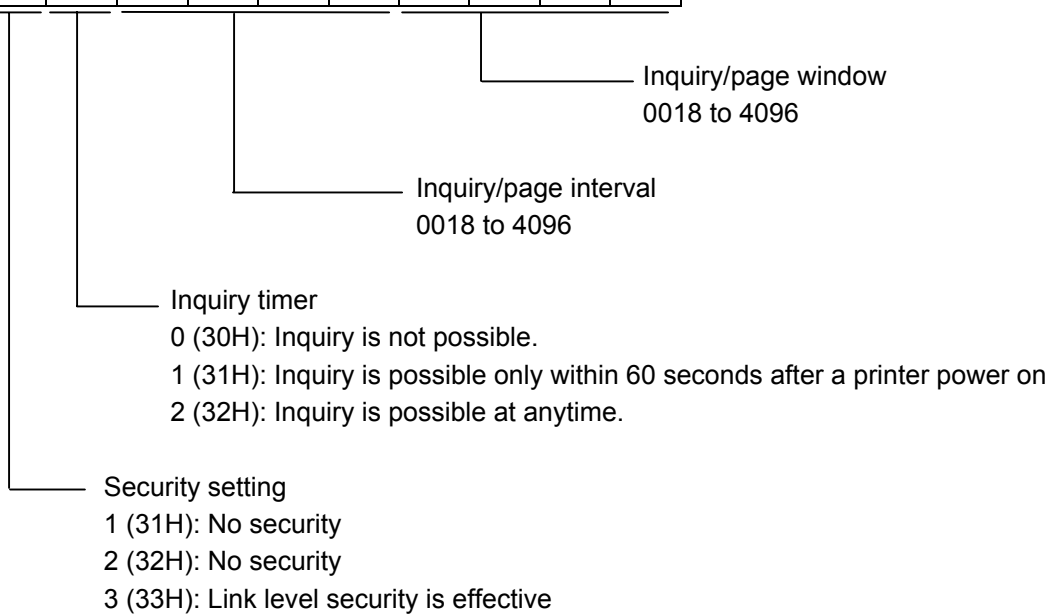
**Function** Acquires the parameters related to the Bluetooth.

**Format** [ESC] WT [LF] [NUL]

**Explanation** (1) This command reads the parameters related to the Bluetooth. When using the IrDA: TEC Protocol, the following information field is placed in the information frame and sent in packets to the host.

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |



| Bluetooth device name | CRC |     |
|-----------------------|-----|-----|
| 32 bytes              | xxH | xxH |

Bluetooth device name: Fixed at 32 bytes

When the Bluetooth device name is "TOSHIBATEC BT,"

[54H] [4FH] [53H] [48H] [49H] [42H] [41H] [20H] [54H] [45H] [43H] [20H] [42H] [54H] [00H] [00H]  
T O S H I B A " T E C " B T  
[00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H]

\* When the Bluetooth device name is less than 32 bytes, the remaining bytes are filled with 00H.

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |

|                       |
|-----------------------|
| Bluetooth device name |
| 32 bytes              |

## **9. ERROR PROCESSING**

### **9.1 GENERAL DESCRIPTION**

This chapter describes details regarding the errors of the printer.

If the printer detects an error, it indicates an error message (on the LCD or LED), returns a status response and stops its operation.

## 9.2 COMMUNICATION ERRORS

### 9.2.1 COMMAND SYNTAX ERROR

- ① An error will occur if a command length error or parameter designation error is found while analyzing the command. If the form corresponding to the form number designated by the Data Print Command is not stored, or if the form length designated by the Data Print Command does not match the stored form length, an error will occur.
- ② If the block number is not numbered consecutively, starting with "0" in the ascending order, an error will occur.
- ③ If a block number error is found through the IrDA (TEC Protocol) interface, an error will occur.

### 9.2.2 HARDWARE ERROR

A hardware error will occur if a framing error or parity error is found while receiving data through the serial interface (RS-232C).

- \* At the moment when a command syntax error or hardware error occurs, the printer shows the error message and returns a status response before it stops. Any commands except for the Status Request Command and Reset Command are not processed.

### 9.2.3 LAN DRIVER ERROR

An LAN driver error will occur in the following case.

- When the LAN does not become available at a start of the printer.
  - \* If this error occurs, an error message is displayed on the LCD for 2 seconds.
  - \* If this error occurs, the printer is not connectable with LAN.

### 9.3 ERRORS IN ISSUING OR FEEDING

#### 9.3.1 PAPER JAM / LABEL END / NORMAL END + LABEL END

| B-EP (It does not matter whether the compatibility setting for the B-SP series is on or off.) |                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                               | Paper jam                                                                                                                                                                                                                                                                                  | Label end                                                                                                                                                                                                                                                                                                         | Normal end + label end                                                                                                                                                                                                                                                                                      |
| TPCL / LABEL                                                                                  | While passing over the media sensor, the label is fed over the distance 1.5 times as long as the label pitch (label length + gap length) specified by the command, but the media sensor (or transmissive sensor) cannot detect a gap between the labels.                                   | When (or before) the motor is driven for feeding or printing, the media sensor (transmissive sensor or reflective sensor) detects the label end state.                                                                                                                                                            | While printing is being performed on the label with the transmissive sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously after the effective print length of the current label is printed.                                     |
|                                                                                               | The tag paper is fed over the distance 1.5 times as long as the tag pitch (length of the white portion + black mark length) specified by the command, but the media sensor (or reflective sensor) cannot detect a black mark.                                                              | While printing is being performed on the label with the transmissive sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously before the effective print length of the current label is printed.                                          | While printing is being performed on the tag paper with the reflective sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously after the effective print length of the current label is printed.                                   |
|                                                                                               | While a gap between labels is passing over the media sensor, the label is fed over the distance 1.5 times as long as the label pitch (label length + gap length) specified by the command, but the label cannot be detected.                                                               | While printing is being performed on the tag paper with the reflective sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously before the effective print length of the current label is printed.                                        | While printing is being performed on the receipt with no sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously after the effective print length of the current label is printed.                                                 |
|                                                                                               | While a black mark is passing over the media sensor, the tag paper is fed over the distance 1.5 times as long as the tag pitch (length of the white portion + black mark length) specified by the command, but the white portion cannot be detected.                                       | While printing is being performed on the label with the transmissive sensor designated, the media sensor (transmissive sensor) detects the backing paper for xx mm continuously before the effective print length of the current label is printed.<br>"xx mm" varies depending on the gap length:                 | While printing is being performed on the label with the transmissive sensor designated, the media sensor (transmissive sensor) detects the backing paper for xx mm continuously after the effective print length of the current label is printed.<br>"xx mm" varies depending on the gap length:            |
|                                                                                               | With the automatic label print positioning enabled, and the transmissive sensor designated, the label is loaded, and the cover is opened and closed.<br>If the label pitch is 170 mm or less, the backing paper is fed over the distance of 170 mm, but the label cannot be detected.      | 21 mm for a 3-mm gap<br>22 mm for a 4-mm gap<br>23 mm for a 5-mm gap<br>24 mm for a 6-mm gap<br>25 mm for a 7-mm gap                                                                                                                                                                                              | 21 mm for a 3-mm gap<br>22 mm for a 4-mm gap<br>23 mm for a 5-mm gap<br>24 mm for a 6-mm gap<br>25 mm for a 7-mm gap                                                                                                                                                                                        |
|                                                                                               | If the label pitch is longer than 170 mm, the label is fed over the distance 1.5 times as long as the label pitch (label length + gap length) specified by the command, but the label cannot be detected.                                                                                  | While printing is being performed on the tag paper with the reflective sensor designated, the media sensor (reflective sensor) detects the black mark over for xx mm continuously before the effective print length of the current label is printed.<br>"xx mm" varies depending on the length of the black mark: | While printing is being performed on the tag paper with the reflective sensor designated, the media sensor (reflective sensor) detects the black mark for xx mm continuously after the effective print length of the current label is printed.<br>"xx mm" varies depending on the length of the black mark: |
|                                                                                               | With the automatic label print positioning enabled, and the reflective sensor designated, the tag paper is loaded, and the cover is opened and closed.<br>If the tag pitch is 170 mm or less, the black mark is fed over the distance of 170 mm, but the white portion cannot be detected. | 21 mm for a 3-mm black mark<br>22 mm for a 4-mm black mark<br>23 mm for a 5-mm black mark<br>24 mm for a 6-mm black mark<br>25 mm for a 7-mm black mark                                                                                                                                                           | 21 mm for a 3-mm black mark<br>22 mm for a 4-mm black mark<br>23 mm for a 5-mm black mark<br>24 mm for a 6-mm black mark<br>25 mm for a 7-mm black mark                                                                                                                                                     |

|  |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | If the label pitch is longer than 170 mm, the tag paper is fed over the distance 1.5 times as long as the tag pitch (length of the white portion + black mark length) specified by the command, but a black mark cannot be detected. | While printing is being performed on the receipt with no sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously before the effective print length of the current receipt is printed. |  |
|  |                                                                                                                                                                                                                                      | While the label is being fed with the transmissive sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously.                                                                           |  |
|  |                                                                                                                                                                                                                                      | While the tag paper is being fed with the reflective sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously.                                                                         |  |
|  |                                                                                                                                                                                                                                      | While the receipt is being fed with no sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously.                                                                                       |  |

| B-EP (It does not matter whether the compatibility setting for the B-SP series is on or off.) |           |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                               | Paper jam | Label end                                                                                                                                                                                                                                              | Normal end + label end                                                                                                                                                                                                                                                                        |
| RECEIPT                                                                                       |           | When (or before) the motor is driven for feeding or printing, the media sensor (transmissive sensor or reflective sensor) detects the label end state.                                                                                                 | The media sensor (transmissive sensor or reflective sensor) detects the label end state before a print image that is printable in a single print job is printed completely. After that, while the media sensor is detecting the label end state for 1 mm continuously, printing is completed. |
|                                                                                               |           | While printing is performed on the receipt with no sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously before the effective print length of the current label is printed. |                                                                                                                                                                                                                                                                                               |
|                                                                                               |           | While the receipt is being fed with the reflective sensor designated, the media sensor (transmissive sensor or reflective sensor) detects the label end state for 1 mm continuously.                                                                   |                                                                                                                                                                                                                                                                                               |
| RECEIPT/ESC/POS                                                                               |           | When (or before) the motor is driven for feeding or printing, the media sensor (transmissive sensor or reflective sensor) detects the label end state.                                                                                                 |                                                                                                                                                                                                                                                                                               |
|                                                                                               |           | The media sensor (transmissive sensor or reflective sensor) detects the label end state for 10 mm continuously before printing is completed.                                                                                                           |                                                                                                                                                                                                                                                                                               |
|                                                                                               |           | While the media sensor (transmissive sensor or reflective sensor) is detecting the label end state for 10 mm continuously, the "no print data" state is detected for 1.5 mm continuously.                                                              |                                                                                                                                                                                                                                                                                               |

### 9.3.2 BROKEN HEAD DOTS ERROR

- ① If broken head dots are detected in the broken head dots check when turning the power on or closing the cover, an error will occur.
- ② If the thermal head driver fails, an error will occur.

### 9.3.3 THERMAL HEAD EXCESSIVE TEMPERATURE

- ① If the thermistor detects an excessively high temperature of 71 °C or higher, an error will occur.

### 9.3.4 COVER OPEN ERROR

- ① If the cover open state is detected for 5 mm continuously while printing or feeding, an error will occur.
- ② When printing is attempted with the cover opened, an error will occur.
  - \* At the moment an error occurs, the printer displays an error message, and returns a status response before it stops. Any commands except for the Status Request Command and the Reset Command are not processed. The [PAUSE] key can be used for resetting except in case where a thermal head excessive temperature error occurs. (The printer resumes printing the label at which the error had occurred.)

## 9.4 BATTERY ERROR

### 9.4.1 LOW BATTERY

The LED lights up in red, if printing is cannot be performed any more because the battery level is low.

### 9.4.2 ABNORMAL HIGH VOLTAGE

If it is detected that the battery voltage exceeds 9.5V for B-EP2DL or 17.5V for B-EP4DL, an error will occur.

### 9.4.3 ABNORMAL BATTERY TEMPERATURE

If it is detected that the battery temperature exceeds 61 °C or is below -20 °C, an error will occur.

## 9.5 CHARGING ERROR

A charging error will occur if the following operations are performed while the AC adapter is connected.

- ① If the power of the printer is turned on while it is off (with no battery attached)
- ② If the battery is removed while the power of the printer is on

## 9.6 BLUETOOTH SETTING ERROR

The printer recognizes an error when the Bluetooth related parameter setting fails.

## 9.7 ERRORS IN WRITABLE CHARACTER AND PC COMMAND SAVE MODES

### 9.7.1 WRITE ERROR

- An error has occurred in writing data in the storage memory.

### 9.7.2 FORMAT ERROR

- An erase error has occurred in formatting the storage memory.

### 9.7.3 MEMORY FULL

- Further data cannot be stored any more because of insufficient space in the storage memory.

\* At the moment when an error occurs, the printer displays an error message, and returns a status response before it stops. Any commands except for the Status Request Command and the Reset Command are not processed. Restoration by the [RESTART] key is not allowed.

\* An error message, "SYSTEM ERROR 19", indicates that the recovery of the BD address for the Bluetooth module has been completed. (Supported by V1.2 or later.)



## 9.8 SYSTEM ERRORS

### 9.8.1 ADDRESS ERROR

- A command has been fetched from an odd address.
- Word data has been accessed from a place other than the boundary of the word data.
- Long word data has been accessed from a place other than the boundary of the long word data.

### 9.8.2 GENERAL INVALID COMMAND EXCEPTION

- An undefined command in a place other than the delay slot has been decoded.

### 9.8.3 SLOT INVALID EXCEPTION

- An undefined command in the delay slot has been decoded.
- A command which rewrites the data in the delay slot has been decoded.

### 9.8.4 PCB IDENTIFICATION ERROR

- The B-EP4DL Drive PCB is connected to the B-EP2DL Main PCB, or the firmware for the B-EP4DL model is downloaded to the B-EP2DL.
- The B-EP2DL Drive PCB is connected to the B-EP4DL Main PCB, or the firmware for the B-EP2DL model is downloaded to the B-EP4DL.

### 9.8.5 THERMAL HEAD IDENTIFICATION ERROR

- The thermal head for the B-EP4DL is connected to the B-EP2DL Main PCB.
- The thermal head for the B-EP2DL is connected to the B-EP4DL Main PCB.
- \* As soon as the error occurs, the printer displays an error message, and stops.  
(No commands or key operations ([FEED] key / [PAUSE] key) are processed except for the [POWER] key.)

## 9.9 OPERATIONS WHEN AN ERROR OCCURS

If the printer detects an error, the LED will blink (at intervals of 0.1 seconds), the printer stops the operation, and reverts to a wait state for a command from the host.

## 9.10 OPERATIONS AFTER AN ERROR IS CLEARED

### 9.10.1 LABEL MODE

If the [FEED] key is pressed, the remaining number of labels is not issued. Since the printer issues only the same label as one which is being printed when the error occurs, issue the required number of labels by pressing the [FEED] key.

### 9.10.2 RECEIPT MODE

If the [FEED] key is pressed, the printer performs a 20-mm feed.

### 9.10.3 RECEIPT1 MODE OR ESC/POS MODE

After the label end error or the cover open error is cleared, the printer automatically continues printing the data which has been received before the error occurred. After paper is replaced, the error is cleared by pressing the [PAUSE] key. Then, the printer automatically continues printing. When the cover is closed, if the printer has run out of the paper, the printer neither clears the error nor continues printing. It remains in the error state. In any state other than the above, the printer performs a 20-mm feed by pressing the [FEED] key.

\* If the cover is opened due to the pressing of the key during printing, the head will separate from the platen. Therefore, printing does not necessarily continue.

### 9.10.4 TPCL MODE

After the label end error or the cover open error is cleared, the printer automatically continues printing the data which has been received before the error occurred. After paper is replaced, the error is cleared by pressing the [PAUSE] key. Then, the printer automatically continues printing. If the sensor is designated, the printer feeds the paper to the print start position, then continues printing. When the cover is closed, if the printer has run out of the paper, the printer neither clears the error nor continues printing. It remains in the error state. In any state other than the above, if the sensor is designated, when the [FEED] key is pressed, the printer performs the specified label pitch length of the feed. If no sensor is designated, the printer performs a 20-mm feed.

## 9.11 STATUS VALUES

[The compatible mode for the B-SP series is off.]

\* The values in the upper cell are provided for the LABEL/RECEIPT mode (1 byte).  
The values in the lower cell are provided for the TPCL mode (3 bytes).

| State                                       | LED indication          | Status by the Status Request Command                                       | Auto status transmission                             | Status when the command is received during an error state                  | Condition of clearing error                                                 |
|---------------------------------------------|-------------------------|----------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------|
|                                             |                         | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | RS-232C<br>IrDA<br>Bluetooth<br>Wireless LAN                                |
| Power is turned on.                         | Blink in green          | —                                                                          | —                                                    | —                                                                          | —                                                                           |
| Normal state (Idling)                       | ON in green (or orange) | 00H<br>30H, 30H, 31H                                                       | —                                                    | —                                                                          | —                                                                           |
| Cover open state                            | ON in green (or orange) | 01H<br>30H, 31H, 31H                                                       | —                                                    | 01H<br>30H, 31H, 32H                                                       | —                                                                           |
| Command syntax error                        | Blink in red            | 02H<br>30H, 36H, 31H                                                       | 02H<br>30H, 36H, 32H                                 | 02H<br>30H, 36H, 32H                                                       | Reset by the [PAUSE] key.                                                   |
| Paper jam                                   | Blink in red            | 03H<br>31H, 31H, 31H                                                       | 03H<br>31H, 31H, 32H                                 | 03H<br>31H, 31H, 32H                                                       | Restart by the [PAUSE] key.                                                 |
| Label end                                   | Blink in red            | 04H<br>31H, 33H, 31H                                                       | 04H<br>31H, 33H, 32H                                 | 04H<br>31H, 33H, 32H                                                       | Restart by the [PAUSE] key after loading paper.                             |
| Cover open error                            | Blink in red            | 05H<br>31H, 35H, 31H                                                       | 05H<br>31H, 35H, 32H                                 | 05H<br>31H, 35H, 32H                                                       | Close the cover.                                                            |
| Broken head dots error                      | Blink in red            | 06H<br>31H, 37H, 31H                                                       | 06H<br>31H, 37H, 32H                                 | 06H<br>31H, 37H, 32H                                                       | Turn the power off or restart by the [PAUSE] key. Replace the thermal head. |
| Thermal head excessive temperature          | Blink in red            | 07H<br>31H, 38H, 31H                                                       | 07H<br>31H, 38H, 32H                                 | 07H<br>31H, 38H, 32H                                                       | Turn the power off.                                                         |
| Flash ROM write error                       | Blink in red            | 08H<br>35H, 30H, 31H                                                       | 08H<br>35H, 30H, 32H                                 | 08H<br>35H, 30H, 32H                                                       | Turn the power off.                                                         |
| Flash ROM erase error                       | Blink in red            | 09H<br>35H, 31H, 31H                                                       | 09H<br>35H, 31H, 32H                                 | 09H<br>35H, 31H, 32H                                                       | Turn the power off.                                                         |
| Low battery (Printing cannot be performed.) | ON in red               | 0AH<br>33H, 36H, 31H                                                       | 0AH<br>33H, 36H, 32H                                 | 0AH<br>33H, 36H, 32H                                                       | Turn the power off.                                                         |
| Operating (Communicating)                   | ON in green             | 0BH<br>30H, 32H, 31H                                                       | —                                                    | —                                                                          | —                                                                           |
| Communication error * RECEIPT/232C only     | Blink in red            | 0CH<br>—                                                                   | 0CH<br>—                                             | 0CH<br>—                                                                   | Reset by the [PAUSE] key.                                                   |
| Normal end + Label end                      | Blink in red            | 0DH<br>30H, 39H, 31H                                                       | 0DH<br>30H, 39H, 32H                                 | 0DH<br>30H, 39H, 32H                                                       | Restart by the [PAUSE] key. Load paper.                                     |
| Flash ROM storage area full state           | Blink in red            | 0EH<br>35H, 34H, 31H                                                       | 0EH<br>35H, 34H, 32H                                 | 0EH<br>35H, 34H, 32H                                                       | Turn the power off.                                                         |
| Wait for strip                              | ON in green             | 0FH<br>30H, 35H, 31H                                                       | —                                                    | —                                                                          | —                                                                           |
| Abnormal battery temperature                | Blink in red            | 32H<br>33H, 32H, 31H                                                       | 32H<br>33H, 32H, 32H                                 | 32H<br>33H, 32H, 32H                                                       | Turn the power off.                                                         |
| Battery excessive temperature               | Blink in red            | 33H<br>33H, 33H, 31H                                                       | 33H<br>33H, 33H, 32H                                 | 33H<br>33H, 33H, 32H                                                       | Turn the power off.                                                         |

| State                                      | LED indication | Status by the Status Request Command                                       | Auto status transmission                             | Status when the command is received during an error state                  | Condition of clearing error                  |
|--------------------------------------------|----------------|----------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------|
|                                            |                | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | RS-232C<br>IrDA<br>Bluetooth<br>Wireless LAN |
| Charging error                             | Blink in red   | 37H<br>33H, 37H, 31H                                                       | 37H<br>33H, 37H, 32H                                 | 37H<br>33H, 37H, 32H                                                       | Turn the power off.                          |
| Bluetooth initialization error             | Blink in red   | 39H<br>33H, 39H, 31H                                                       | 39H<br>33H, 39H, 32H                                 | 39H<br>33H, 39H, 32H                                                       | Turn the power off.                          |
| Bluetooth setup error                      | Blink in red   | 39H<br>33H, 39H, 31H                                                       | 39H<br>33H, 39H, 32H                                 | 39H<br>33H, 39H, 32H                                                       | Turn the power off.                          |
| Wait for battery recovery                  | ON in green    | 45H<br>34H, 35H, 31H                                                       |                                                      |                                                                            |                                              |
| Wait for head temperature reduction        | ON in green    | 46H<br>34H, 36H, 31H                                                       |                                                      |                                                                            |                                              |
| Wait for motor temperature reduction       | ON in green    | 47H<br>34H, 37H, 31H                                                       |                                                      |                                                                            |                                              |
| Pause state                                | OFF            | 14H<br>30H, 34H, 31H                                                       |                                                      |                                                                            | Press the [PAUSE] key.                       |
| Bit map writable character/PC command mode | ON in green    | 55H<br>35H, 35H, 31H                                                       |                                                      |                                                                            |                                              |
| Sleep                                      | ON in green    | —                                                                          | —                                                    | —                                                                          | —                                            |
| Ir packet error                            | Blink in red   | 02H<br>30H, 36H, 31H                                                       | 02H<br>30H, 36H, 32H                                 | 02H<br>30H, 36H, 32H                                                       | Reset by the [PAUSE] key                     |

[The compatible mode for the B-SP series is on.]

\* The values in the upper cell are provided for the LABEL/RECEIPT mode (1 byte).  
The values in the lower cell are provided for the TPCL mode (3 bytes).

| State                                       | LED indication          | Status by the Status Request Command                                       | Auto status transmission                             | Status when the command is received during an error state                  | Condition of clearing error                                                 |
|---------------------------------------------|-------------------------|----------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------------|
|                                             |                         | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | RS-232C<br>IrDA<br>Bluetooth<br>Wireless LAN                                |
| Power is turned on.                         | Blink in green          | —                                                                          | —                                                    | —                                                                          | —                                                                           |
| Normal state (Idling)                       | ON in green (or orange) | 00H<br>30H, 30H, 31H                                                       | —                                                    | —                                                                          | —                                                                           |
| Cover open state                            | ON in green (or orange) | 01H<br>30H, 31H, 31H                                                       | —                                                    | 01H<br>30H, 31H, 32H                                                       | —                                                                           |
| Command syntax error                        | Blink in red            | 02H<br>30H, 36H, 31H                                                       | 02H<br>30H, 36H, 32H                                 | 02H<br>30H, 36H, 32H                                                       | Reset by the [PAUSE] key.                                                   |
| Paper jam                                   | Blink in red            | 03H<br>31H, 31H, 31H                                                       | 03H<br>31H, 31H, 32H                                 | 03H<br>31H, 31H, 32H                                                       | Restart by the [PAUSE] key.                                                 |
| Label end                                   | Blink in red            | 04H<br>31H, 33H, 31H                                                       | 04H<br>31H, 33H, 32H                                 | 04H<br>31H, 33H, 32H                                                       | Restart by the [PAUSE] key after loading paper.                             |
| Cover open error                            | Blink in red            | 05H<br>31H, 35H, 31H                                                       | 05H<br>31H, 35H, 32H                                 | 05H<br>31H, 35H, 32H                                                       | Close the cover.                                                            |
| Broken head dots error                      | Blink in red            | 06H<br>31H, 37H, 31H                                                       | 06H<br>31H, 37H, 32H                                 | 06H<br>31H, 37H, 32H                                                       | Turn the power off or restart by the [PAUSE] key. Replace the thermal head. |
| Thermal head excessive temperature          | Blink in red            | 07H<br>31H, 38H, 31H                                                       | 07H<br>31H, 38H, 32H                                 | 07H<br>31H, 38H, 32H                                                       | Turn the power off.                                                         |
| Flash ROM write error                       | Blink in red            | 08H<br>35H, 30H, 31H                                                       | 08H<br>35H, 30H, 32H                                 | 08H<br>35H, 30H, 32H                                                       | Turn the power off.                                                         |
| Flash ROM erase error                       | Blink in red            | 09H<br>35H, 31H, 31H                                                       | 09H<br>35H, 31H, 32H                                 | 09H<br>35H, 31H, 32H                                                       | Turn the power off.                                                         |
| Low battery (Printing cannot be performed.) | ON in red               | 0AH<br>33H, 36H, 31H                                                       | 0AH<br>33H, 36H, 32H                                 | 0AH<br>33H, 36H, 32H                                                       | Turn the power off.                                                         |
| Operating (Communicating)                   | ON in green             | 0BH<br>30H, 32H, 31H                                                       | —                                                    | —                                                                          | —                                                                           |
| Communication error * RECEIPT/232C only     | Blink in red            | 0CH<br>—                                                                   | 0CH<br>—                                             | 0CH<br>—                                                                   | Reset by the [PAUSE] key.                                                   |
| Normal end + Label end                      | Blink in red            | 0DH<br>30H, 39H, 31H                                                       | 0DH<br>30H, 39H, 32H                                 | 0DH<br>30H, 39H, 32H                                                       | Restart by the [PAUSE] key. Load paper.                                     |
| Flash ROM storage area full                 | Blink in red            | 0EH<br>35H, 34H, 31H                                                       | 0EH<br>35H, 34H, 32H                                 | 0EH<br>35H, 34H, 32H                                                       | Turn the power off.                                                         |
| Wait for strip                              | ON in green             | 0FH<br>30H, 32H, 31H                                                       |                                                      |                                                                            |                                                                             |
| Abnormal battery temperature                | Blink in red            | 07H<br>31H, 38H, 31H                                                       | 07H<br>31H, 38H, 32H                                 | 07H<br>31H, 38H, 32H                                                       | Turn the power off.                                                         |
| Battery excessive temperature               | Blink in red            | 07H<br>31H, 38H, 31H                                                       | 07H<br>31H, 38H, 32H                                 | 07H<br>31H, 38H, 32H                                                       | Turn the power off.                                                         |

| State                                      | LED indication | Status by the Status Request Command                                       | Auto status transmission                             | Status when the command is received during an error state                  | Condition of clearing error                  |
|--------------------------------------------|----------------|----------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------|----------------------------------------------|
|                                            |                | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | IrDA: TEC Protocol<br>IrDA: IrCOMM<br>RS-232C<br>Bluetooth<br>Wireless LAN | RS-232C<br>IrDA<br>Bluetooth<br>Wireless LAN |
| Charging error                             | Blink in red   | 37H<br>33H, 37H, 31H                                                       | 37H<br>33H, 37H, 32H                                 | 37H<br>33H, 37H, 32H                                                       | Turn the power off.                          |
| Bluetooth initialization error             | Blink in red   | 39H<br>33H, 39H, 31H                                                       | 39H<br>33H, 39H, 32H                                 | 39H<br>33H, 39H, 32H                                                       | Turn the power off.                          |
| Bluetooth setup error                      | Blink in red   | 39H<br>33H, 39H, 31H                                                       | 39H<br>33H, 39H, 32H                                 | 39H<br>33H, 39H, 32H                                                       | Turn the power off.                          |
| Wait for battery recovery                  | ON in green    | 0BH<br>30H, 32H, 31H                                                       |                                                      |                                                                            |                                              |
| Wait for head temperature reduction        | ON in green    | 0BH<br>30H, 32H, 31H                                                       |                                                      |                                                                            |                                              |
| Wait for motor temperature reduction       | ON in green    | 0BH<br>30H, 32H, 31H                                                       |                                                      |                                                                            |                                              |
| Pause state                                | OFF            | 0BH<br>30H, 32H, 31H                                                       |                                                      |                                                                            | Press the [PAUSE] key.                       |
| Bit map writable character/PC command mode | ON in green    | 0BH<br>30H, 32H, 31H                                                       |                                                      |                                                                            |                                              |
| Sleep                                      | ON in green    | —                                                                          | —                                                    | —                                                                          | —                                            |
| Ir packet error                            | Blink in red   | 02H<br>30H, 36H, 31H                                                       | 02H<br>30H, 36H, 32H                                 | 02H<br>30H, 36H, 32H                                                       | Reset by the [PAUSE] key                     |

- \* The LED goes OFF when:
  - The auto power-off function is performed. (This is the same state when the printer is turned OFF.)
  - The error LED turns off in 5 minutes if the auto power-off time is set to 6 minutes or more.

## 10. SYSTEM MODE

### 10.1 GENERAL DESCRIPTION

This chapter describes details regarding the interface commands for the SYSTEM mode. For specification regarding keys, refer to the Key Operation Specification, and command specification for setup tools, refer to the Setup Command Specification.

### 10.2 STARTING THE PRINTER IN SYSTEM MODE

Unlike the TPCL, TPCL1, LABEL, RECEIPT, RECEIPT1 and ESC/POS modes, the SYSTEM mode cannot be accessed by the Mode Select Command. The SYSTEM mode can be accessed by turning on the power of the printer while holding down the FEED or PAUSE key..

### 10.3 COMMUNICATIONS CONDITIONS

Communication is carried out using values currently set for the printer.

Communication is enabled via all interfaces except for Wireless LAN and Bluetooth (B-EP-GH32.)

Once communication has started, interface type does not automatically change to another. To change the interface type, it is required to press the FEED key or PAUSE key, or turning the printer power off then on.

For communication statuses of each interface, refer to "I/F SETTING" in the SYSTEM mode.

\* For details, refer to the Key Operation Specification.

### 10.4 LIMITATIONS IN SYSTEM MODE

When the SYSTEM mode is selected, the printer does not enter into the power save mode.

When the SYSTEM mode is selected, the auto power-off function is not performed.

The settings specified by any Set Commands are stored into flash ROM, when the printer is turned OFF or is initialized by the Initialize Command. They take effect when the printer is turned ON, or after initialization is completed. Do not remove the battery during storing the settings, or the data cannot be written into flash ROM.



## 10.5 OUTLINE OF COMMANDS

### 10.5.1 FORMAT OF INTERFACE COMMAND

|     |                |    |     |
|-----|----------------|----|-----|
| ESC | Command & Data | LF | NUL |
|-----|----------------|----|-----|

- The length from [ESC] to [LF] [NUL] must be as specified by each command.
- There is the following control code:
  - ① ESC (1BH), LF (0AH), NUL (00H)
  - ② { (7BH), | (7CH), } (7DH)

### 10.5.2 HOW TO USE REFERENCE

**Function** Describes the outline of the function of the command.

**Format** Shows the format of the command.

The format designation method should conform to the following rules:

- Each set of small letters (such as aa, bbbb) indicates a parameter item.
- An item enclosed in parentheses may be omitted.
- “---” indicates the repetition of an item.
- Brackets and parentheses are used only in coding, and must not be transmitted in practice.
- Other symbols must always be inserted at designated positions before being transmitted.

**Term** Explains the term(s) used in the format.  
\* “0 to 999” described in the entry range indicates that up to 3-digit variable-length entry is allowed. (Entry of “001” or “009” is also possible.) “000 to 999” indicates that the entry must be fixed to 3 digits.

**Explanation** Explains the command in detail.

**Note** Supplementary explanation of the command.

**Refer to** Related commands

**Examples** Explains the command examples.

[ESC] FM [LF] [NUL]

The above corresponds to the transfer of the following:

1B 46 4D 0A 00  
[ESC] F M [LF] [NUL]

### 10.5.3 PRECAUTIONS

The commands and parameters described in this specification must always be used. If any command or parameter other than those covered in this specification are used, the printer's operation will not be guaranteed.

## 10.6 COMMANDS RELATED TO SETTING

### 10.6.1 ID SET COMMAND

[ESC] ID

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets the ID for the printer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Format      | [ESC] ID; aa(, b) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Term        | <p>aa: Printer ID (2-byte hex data)<br/>0000H to FFFFH</p> <p>b: Wireless LAN IP Address Invalid Setting<br/>(Omissible. If omitted, IP address setting is effective.)<br/>0: IP Address setting is invalid.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Explanation | (1) The printer ID is the information required for the host, such as a handy terminal, to identify each printer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Notes       | <p>(1) The set printer ID is backed up in memory (even if the power is turned off).</p> <p>(2) The last 5 digits of the printer's serial number have been set as the printer ID, at the time of shipment from the factory.</p> <p>(3) In IrDA: TEC Protocol, the printer checks the set ID against the ID in the received command packet. If they do not match, the printer discards the command packet. However, when the ID in the command packet is "0", the printer accepts the command packet without checking the set IDs.</p> <p>(4) In case of the wireless LAN model, the printer's ID will be set as the lower 2-byte number of the IP address unless "0" is set to the Wireless LAN IP Address Invalid Setting parameter. The upper 2 bytes are fixed to "192.168." At this time, the subnet mask will be set to "255.255.0.0."</p> |
| Example     | <p>To set "03H 51H" as the ID of the printer:</p> <p>[ESC] ID; [03H] [51H] [LF] [NUL]</p> <p>In this case, the printer ID in status printing is "00849."</p> <p>In case of the wireless LAN model, the IP address is "192.168.3.81."</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

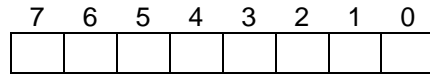
10.6.2 MODE SELECT COMMAND

[ESC] M

**Function** Changes the print mode.

**Format** [ESC] M; a(, b) [LF] [NUL]

**Term** a: Print mode designation



Print mode (Bit 0 to Bit 6 \* See Table 1.)

Automatic status response in IrDA: IrCOMM or USB

0: Not performed

1: Performed

\* Table 1 Print mode

| HEX | Mode     | How to deal with the received data after an error is cleared |
|-----|----------|--------------------------------------------------------------|
| 30H | LABEL    | Discards                                                     |
| 31H | RECEIPT  | Discards                                                     |
| 32H | RECEIPT1 | Continues printing                                           |
| 34H | ESC/POS  | Continues printing                                           |
| 41H | TPCL     | Continues printing                                           |
| 42H | TPCL1    | Continues printing                                           |

b: Print position detection feed

(Omissible. If omitted, the print position detection feed is not performed.)

0: When the mode change from RECEIPT, RECEIPT1 or ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is not performed after the mode is changed.

1: When the mode change from RECEIPT, RECEIPT1, ESC/POS to LABEL, TPCL or TPCL1 is requested, a print position detection feed is performed after the mode is changed.

**Explanation**

- (1) There are 4 types of the print mode: "LABEL," "RECEIPT," "TPCL," and "ESC/POS."
- (2) "Automatic status response in IrDA: IrCOMM or USB is the function for the specifications which do not allow the printer to spontaneously send the status through IrDA; IrCOMM or USB. This function enables the printer to forcefully send the status to the host, if the link between the printer and the host is established. However, if the link between the printer and the host is not established upon the status transmission, the printer cannot send the status. Therefore, the status is discarded. (In the next connection to the host, the printer does not send the status to the host.)
- (3) The sensor is not used in the RECEIPT, RECEIPT1 or ESC/POS mode. When sensor detectable paper is used for receipts and labels, print position detection feed cannot be done in the LABEL, TPCL or TPCL1 mode. By setting the print position detection feed parameter to 1, print position detection feed is carried out after the mode is changed to LABEL, TPCL or TPCL1.
- (4) In the TPCL1 mode, it is possible to re-print the last print data by pressing the FEED button.

Notes

- (1) The print mode designation (the specified print mode and the automatic status response in IrDA: IrCOMM or USB) is backed up in memory (even if the power is turned off).
- (2) The factory default is "30H: TPCL mode" and "Automatic status response in IrDA: IrCOMM or USB is not performed". (The IrDA protocol is "IrCOMM.")
- (3) When the print mode is changed, the type of sensor is automatically changed.
 

|                    |                                                |
|--------------------|------------------------------------------------|
| LABEL mode (0):    | The previously backed up sensor is designated. |
| TPCL mode (A):     | The previously backed up sensor is designated. |
| TPCL1 mode (B):    | The previously backed up sensor is designated. |
| RECEIPT mode (1):  | No sensor is designated.                       |
| RECEIPT1 mode (2): | No sensor is designated.                       |
| ESC/POS mode (4):  | No sensor is designated.                       |
- (4) If the RECEIPT or ESC/POS mode is selected or no sensor is designated in the LABEL or TPCL mode, an initial feed is not performed when the cover is closed. (when the print position detection feed after the cover is closed is enabled with key operations).
- (5) When the mode change is finished, the printer sends the normal end status or an ACK to the host. However, when the mode is changed to the TPCL mode, the printer does not send the status. In IrDA: IrCOMM or USB, only when bit 7 of the print mode designation is set to "1," the printer sends the status.
- (6) The print mode can be changed by the printer itself. However, since the setting for the automatic status response in IrDA: IrCOMM or USB cannot be changed, the setting remains as the same.
- (7) The print position detection feed is performed according to the conditions, such as, label pitch, fine adjustment, and sensor selection, which were set in the LABEL or TPCL mode before the printer is operated in the RECEIPT, RECEIPT1 or ESC/POS mode. If no sensor is selected, the print position detection feed will not be performed.
- (8) After performing a print position detection feed, the printer does not send a process end status. If an error occurs during the print position detection feed, the feed is performed after the error is cleared by pressing the PAUSE key (when the print position detection feed after the cover is closed is enabled with key operations).
- (9) The print position detection feed is ignored when it is specified in the SYSTEM mode.
- (10) When changing the print mode by the printer itself, the print position detection feed parameter cannot be set.
- (11) When the mode select command is designated with the print position detection feed at the end of a print data issued in RECEIPT1 or ESC/POS mode, and if an error occurs while printing, the printing will restart after the error is cleared and then, the print mode will be changed to the LABEL or TPCL mode and a print position detection feed is performed. When the print position detection feed setting is omitted, the mode is not changed to LABEL or TPCL (the mode select command is discarded).

- (12) When the LABEL or TPCL mode is selected in the mode select command and the print position detection feed parameter is set 0 (not performed), and if an error occurs while the printer issues in RECEIPT1 or ESC/POS mode, the print mode is changed to the LABEL or TPCL mode after the error is cleared. (The mode select command is executed.)

## 10.7 COMMANDS RELATED TO FINE ADJUSTMENT

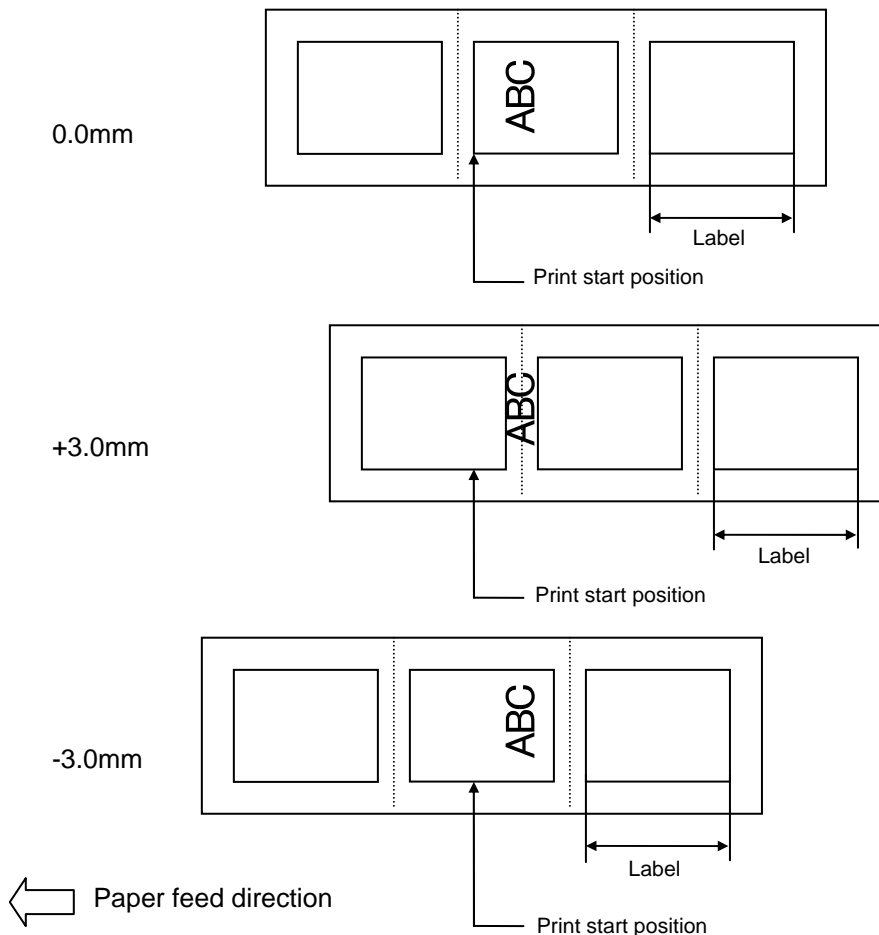
### 10.7.1 PRINT START POSITION FINE ADJUST COMMAND [ESC] AX

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Adjusts the feed value so that the label will be shifted forward or backward from the print start position automatically determined.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format   | [ESC] AX; abbb, cddd, eff(, g) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Term     | <p>a: Indicates the direction, forward or backward, in which a fine adjustment is to be made.<br/>         +: Backward<br/>         -: Forward</p> <p>bbb: Fine adjustment value for print position<br/>         000 to 500 (in 0.1 mm units)</p> <p>c: Indicates the direction of the strip position, forward or backward.<br/>         +: Backward<br/>         -: Forward</p> <p>ddd: Fine adjustment value for strip position<br/>         000 to 030<br/>         * In - (Forward) a fine adjustment is to be made between 000 and 020.</p> <p>e: Reserved area<br/>         Fixed at +.</p> <p>ff: Reserved area<br/>         Fixed at 00.</p> <p>g: Reserved area (Omissible)</p> <p>hhh: Reserved area (Omissible)</p> <p>[In compatible mode for the B-SP series]</p> <p>a: Indicates the direction, forward or backward, in which a fine adjustment is to be made.<br/>         +: Backward<br/>         -: Forward</p> <p>bbb: Fine adjustment value for print position<br/>         000 to 500 (in 0.1 mm units)</p> <p>c: Reserved area<br/>         Fixed at +.</p> <p>ddd: Reserved area<br/>         Fixed at 000.</p> <p>e: Reserved area<br/>         Fixed at +.</p> <p>ff: Reserved area<br/>         Fixed at 00.</p> <p>g: Reserved area (Omissible)</p> <p>hhh: Reserved area (Omissible)</p> |

Explanation

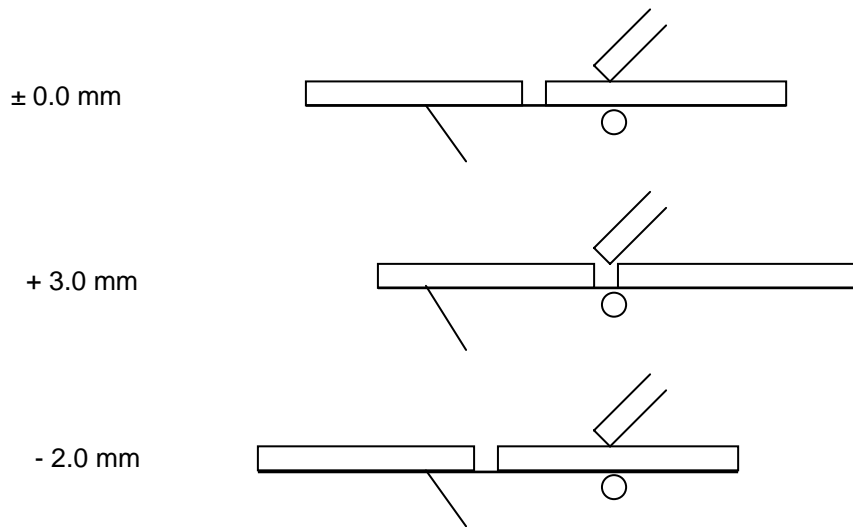
- (1) When any value other than + or - is designated for the backward/forward print position fine adjustment, a command error results.
- (2) When any fine adjustment value for print position which is out of the above range, is set, an error results.
- (3) A range check is not carried out for the reserved areas. However, only numerals can be used.
- (4) The fine adjustment value is a sum of the value set using this command and the value set in the SYSTEM mode (through printer key operations). However, the maximum value is  $\pm 50.0$  mm. When the sum exceeds  $\pm 50.0$  mm, the value is corrected to  $\pm 50.0$  mm when printing is performed.
- (5) The fine adjustment value for strip position is valid only when "the compatible mode for the B-SP series" is turned off in the SYSTEM mode. When the parameter "a" is set to any value other than "+" or "-", a command error occurs. When the "compatible mode for the B-SP series" is turned on, the value is ignored.

[Print position (feed amount) fine adjustment] (to shift the label backward or forward)

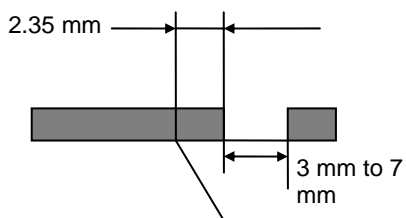
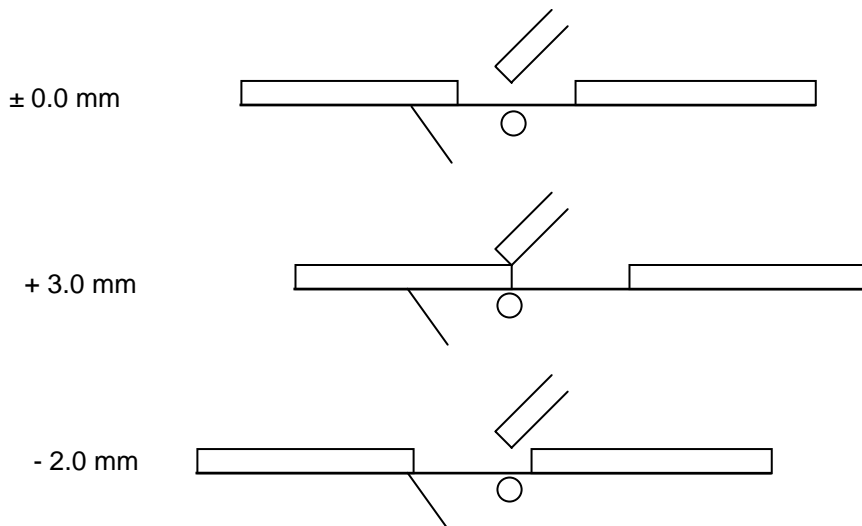


[Strip position fine adjustment]

When the label-to-label gap is 3 mm,



When the label-to-label gap is 7 mm,



- In strip issue mode, printing stops at the position where the distance between the leading edge of the strip plate and the trailing edge of the label is 2.35 mm, regardless of gap length. Note that this applies unless the fine adjustment value for print position is set.
- When the print stop position is not appropriate, the stop position must be changed using strip position fine adjustment.



Notes

- (1) Each fine adjustment value is backed up in memory (even if the power is turned off).
- (2) Each parameter is set to 0.0 mm at the time of shipment from the factory.
- (3) The fine adjustment value for print position and strip position changed by the Position Fine Adjust Command in the TPCL mode, is also effective in the LABEL mode.
- (4) When print position fine adjustment or strip position fine adjustment is set in the SYSTEM mode (through printer key operations), each fine adjustment value is a sum of the value set by this command and the value set in the SYSTEM mode. However, the maximum fine adjustment value is as follows:  
  
Print position fine adjustment:  $\pm 50.0$  mm  
Strip position fine adjustment: -2.0 mm to +3.0 mm  
  
When the sum of the fine adjustment value for print position exceeds  $\pm 50.0$  mm, the fine adjustment value is corrected to  $\pm 50.0$  mm during printing.  
When the sum of the fine adjustment value for strip position exceeds +3.0 mm in the + (backward) direction or -2.0 mm in the - (forward) direction, the fine adjustment value is corrected to +3.0 mm or -2.0 mm, respectively, during printing.
- (5) Strip position fine adjustment is effective only in strip issue mode.
- (6) The fine adjustment value for strip position up to V1.0C is valid only when the fine adjustment value for print position is not selected (fine adjustment value = 0).
- (7) The fine adjustment value for strip position is selected in the negative direction, a label is stopped backward against the print start position. However, the print start position is misaligned by the set value because no back feed is performed in strip issue mode. (When the label-to-label gap is less than 5 mm) \* Refer to the arrows for - 2.0 mm when the label-to-label gap is 3 mm in P.5-15.
- (8) When the label pitch length is 20.0 mm or more but less than 24.0 mm and the effective print length is 15.0 mm or more or the label pitch length is 24.0 mm or more, a back feed is performed before printing.

### 10.7.2 PRINT DENSITY FINE ADJUST COMMAND

[ESC] AY

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Adjusts the automatically set print density.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Format   | [ESC] AY; abb, c(, d) [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Term     | <p>a: Indicates whether to increase or decrease the density<br/>         +: Increase (Darker)<br/>         -: Decrease (Lighter)</p> <p>bb: Fine adjustment value for print density<br/>         00 to 30 (in units of 1 step)</p> <p>c: Print mode<br/>         0: Reserved<br/>         1: Direct thermal</p> <p>d: Head output division designation<br/>         (Omissible. When omitted, settings backed up by the memory are valid.)</p> <p>2-inch print head width<br/>         0: Auto (Divided by 2 or 3)<br/>         1: Reserved (When designated, automatic selection of bipartite/tripartite division is performed.)<br/>         2: Divided by 3 (Fixed)<br/>         3: Auto1 (Not divided/Divided by 2 or 3)/Print quality oriented<br/>         4: Reserved (When designated, tripartite division is performed.)<br/>         5: Auto2 (Not divided/Divided by 2 or 3)/Print speed oriented (supported in V1.0E or later)</p> <p>4-inch print head width<br/>         0: Auto (Divided by 2, 3 or 6)<br/>         1: Reserved (When designated, automatic selection of bipartite/tripartite/6-partite division is performed.)<br/>         2: Reserved (When designated, automatic selection of bipartite/tripartite/6-partite division is performed.)<br/>         3: Auto1 (Not divided/Divided by 2, 3 or 6)<br/>         4: Divided by 6 (Fixed)</p> |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | <p>(1) The standard density is finely adjusted to increase or decrease.</p> <p>(2) When any fine adjustment value for print density out of the above range is set, a command error will occur.</p> <p>(3) If the print mode is set to any value other than "1: Direct thermal", it should be changed to "1."</p> <p>(4) The default value of the head output division designation is "3: Auto1 (Not divided/Divided by 2 or 3)" on the 2-inch print head and "3: Auto1 (Not divided/Divided by 2, 3 or 6)" on the 4-inch print head.</p> <p>(5) When "0: Auto" is designated on the 2-inch print head, "Divided by 2" or "Divided by 3" is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching between "Divided by 2" and "Divided by 3." Therefore, do not designate "0: Auto" when a serial barcode is printed.</p> |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- (6) When “3: Auto1” or “5: Auto2” is designated for the 2-inch print head, “Not divided,” “Divided by 3” or “Divided by 2” is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among “Not divided,” “Divided by 2” and “Divided by 3.” Therefore, do not designate “3: Auto1” or “5: Auto2” when a serial barcode is printed.

The difference between Auto1 and Auto2 is while Auto1 is print quality oriented, Auto2 is print speed oriented. Auto2 is designated to increase the print speed although the print is slightly faded.

- (7) When “0: Auto” is designated on the 4-inch print head, “Divided by 2”, “Divided by 3” or “Divided by 6” is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among “Divided by 2,” “Divided by 3” and “Divided by 6.” Therefore, do not designate “0: Auto” when a serial barcode is printed.
- (8) When “3: Auto1” is designated on the 4-inch print head, “Not divided,” “Divided by 2,” “Divided by 3” or “Divided by 6” is automatically selected for every line according to the print ratio. The width of half a dot may not be printed on the line when switching among “Not divided,” “Divided by 2,” “Divided by 3” and “Divided by 6.” Therefore, do not designate “3: Auto1” when a serial barcode is printed.

### 10.7.3 STRIP SENSOR THRESHOLD VALUE SET COMMAND [ESC] AH, [ESC] AZ

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the sensor threshold value to switch the mode between strip and batch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Format   | [ESC] AH; a [LF] [NUL]<br>[ESC] AZ; a [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Term     | a: Setting<br>0: Operation in conformance with the strip sensor<br>1: Operation in conformance with the strip sensor<br>2: Fixed to the batch mode<br>3: Fixed to the strip mode<br>4: Reserved                                                                                                                                                                                                                                                                                                                                                                                     |
| Notes    | (1) The set parameter value is backed up and kept until a new value is set using this command. When the power is turned on, the backed up value is retrieved and set<br>(2) "0: Operation in conformance with the strip sensor" has been set as the default at the time of shipment from the factory.<br>(3) When either "2: Fixed to the batch mode" or "3: Fixed to the strip mode" for parameter "a" is selected, the printer operates in the specified mode, without automatically switching between the batch and strip modes.<br>(4) Designation of "4: Reserved" is ignored. |

## 10.8 COMMANDS RELATED TO CONTROL

### 10.8.1 INITIALIZE COMMAND

[ESC] WR, [ESC] @

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Returns the printer to its initial state.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Format      | [ESC] WR [LF] [NUL]<br>[ESC] @                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Explanation | <ol style="list-style-type: none"> <li>(1) The printer is returned to the same state as when the power is turned on.</li> <li>(2) If the printer receives this command during printing, the printer prints the label which is being printed, then performs initialization.</li> <li>(3) After the Initialize Command is sent (or after printing is completed, if printing is performed), the next command must not be sent within approximately 30 seconds on the wireless LAN model or within approximately 5 seconds on other models, because the printer is initialized. In IrDA: TEC Protocol, if ACK/status transmission is specified by the Issue Command, the printer returns an ACK, which indicates the command process end, to the EOT after the printer is initialized. In RS-232C, when the status response is specified, the printer returns the status (34H 30H). After this status is received, the next command may be sent. In IrDA: IrCOMM, IrDA: IrOBEX, USB, Bluetooth or Wireless LAN, the printer does not return the status.</li> <li>(4) To use IrDA interface for sending this command to the printer, only this command should be sent. After the command is sent, the link should be terminated. Even if the host does not terminate the link, the printer performs the termination process. Therefore, after initialization is completed, the host should establish the link again.</li> <li>(5) When receiving this command during data transmission, the printer is initialized after transmission is completed.</li> <li>(6) Communication is disabled during self-test printing or slant line printing.</li> </ol> |
| Notes       | <ol style="list-style-type: none"> <li>(1) If a command error or communication error occurs when receiving the Reset Command, an error message is displayed in the online mode. However, it is not displayed in the SYSTEM mode.</li> <li>(2) After the code of the Bit Map Writable Character Command ([ESC] XD) or the Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specifying the type of data.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Examples    | [ESC] WR [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## 10.9 COMMANDS RELATED TO STATUS

### 10.9.1 STATUS REQUEST COMMAND

[ESC] FM, [ESC] WS, [ESC] v

**Function** Sends the printer status to the host computer.

**Format** [ESC] FM [LF] [NUL]  
[ESC] WS [LF] [NUL]  
[ESC] v

**Explanation**

#### [LABEL/RECEIPT modes]

When receiving this command, the printer sends the printer status and battery status to the host.

- For IrDA: TEC Protocol: Data to be sent (Fixed at 27 bytes)

| STX | Printer ID |     | Version No. of each form |     |       |     | Printer status | Battery status | CRC |     |
|-----|------------|-----|--------------------------|-----|-------|-----|----------------|----------------|-----|-----|
| 02H | xxH        | xxH | V01                      | V02 | ..... | V20 | xxH            | xxH            | xxH | xxH |

- For IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN:  
Data to be sent (Fixed at 5 bytes)

| STX | Printer ID |     | Printer status | Battery status |
|-----|------------|-----|----------------|----------------|
| 02H | xxH        | xxH | xxH            | xxH            |

Printer ID.....2-byte hex data (in order from High to Low)

Printer status.....Printer status is indicated in 1-byte data.

- 00H: Normal status (Idling)
- 01H: Cover open status
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Printer operating
- 0CH: Communication error
  - ..... \* For RECEIPT mode/RS-232C connection only
- 0DH: Normal end + Label end (See **NOTE**.)
- 0EH: Flash ROM storage area full state
- 0FH: Wait for strip ..... \* Only in the LABEL mode
- (10H: Normal issue end)
  - Response status for automatic status transmission
- 14H: Pause state
- 19H: Ambient temperature error
- 32H: Abnormal battery temperature
- 33H: Battery excessive temperature
- 37H: Charging error
- 38H: Bluetooth setting successfully completed
- 39H: Bluetooth setup error (including initialization error)
- 45H: Wait for battery recovery
- 46H: Wait for head temperature reduction
- 47H: Wait for motor temperature reduction
- 55H: Writable character/PC command save mode

**NOTE:** In the LABEL mode, "0DH: Normal end + Label end" is a state when the printer runs out of labels, after the effective print length is printed. In the RECEIPT mode, this status is returned to the host when the printer runs out of labels after a receipt is issued.

Status in the compatible mode for B-SP series

- 00H: Normal state (idling)
- 01H: Cover open state
- 02H: Command syntax error (including Ir packet error)
- 03H: Paper jam
- 04H: Label end
- 05H: Cover open error
- 06H: Broken thermal head dots error
- 07H: Thermal head excessive temperature  
( including ambient temperature error, abnormal battery  
temperature and battery excessive temperature )
- 08H: Flash ROM write error
- 09H: Flash ROM erase error
- 0AH: Low battery (Print failure)
- 0BH: Printer operating  
( including the following statuses: wait for strip, pause  
state, writable character/PC command save mode, wait  
for battery recovery, wait for print head/motor  
temperature reduction )
- 0CH: Communication error  
..... \* For RECEIPT mode/RS-232C connection only
- 0DH: Normal end + Label end
- 0EH: Flash ROM storage area full state
- (10H: Normal issue end)  
Response status for automatic status transmission
- 37H: Charging error
- 38H: Bluetooth setting successfully completed
- 39H: Bluetooth setup error (including initialization error)

Battery status .....The battery charge status is indicated in 5 levels.

(B-EP2DL)

- 01H: 7.2 V or less (Print failure)
- 02H: 7.3 V to 7.4 V
- 03H: 7.5 V to 7.7 V
- 04H: 7.8 V to 7.9 V
- 05H: 8.0 V or more

(B-EP4DL)

- 01H: 14.0 V or less (Print failure)
- 02H: 14.1 V to 14.6 V
- 03H: 14.7 V to 15.2 V
- 04H: 15.3 V to 15.9 V
- 05H: 16.0 V to 16.8 V

\* The remaining number of printable labels may vary according to the contents to be printed and the ambient environment.

CRC.....2-byte hex data (in order from Low to High)

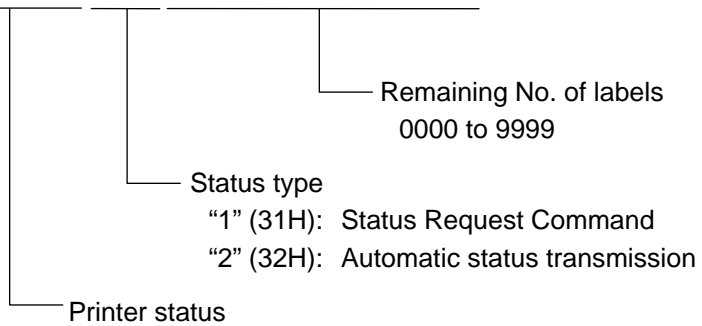


**[TPCL mode]**

This command makes the printer send its status regardless of the status response setting. The status to be transmitted is the current printer status, and indicates the latest status only. The remaining count indicates the remaining count of the batch currently being printed. No remaining count of the batch waiting to be printed is transmitted.

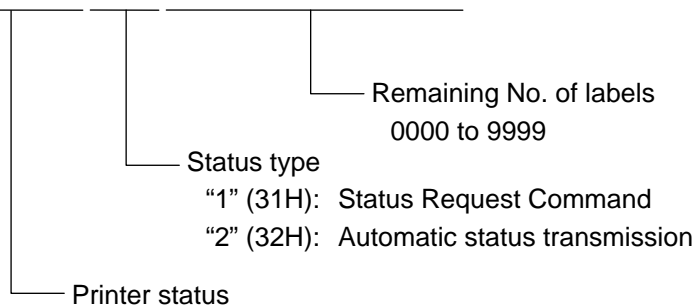
[IrDA: TEC Protocol]

| STX | ID  | ID  | Status |     |     | Remaining No. of labels |     |     |     | CRC |     |
|-----|-----|-----|--------|-----|-----|-------------------------|-----|-----|-----|-----|-----|
| 02H | xxH | xxH | 3xH    | 3xH | 3xH | 3xH                     | 3xH | 3xH | 3xH | xxH | XXH |



[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

| SOH | STX | Status |     |     | Remaining No. of labels |     |     |     | ETX | EOT | CR  | LF  |
|-----|-----|--------|-----|-----|-------------------------|-----|-----|-----|-----|-----|-----|-----|
| 01H | 02H | 3xH    | 3xH | 3xH | 3xH                     | 3xH | 3xH | 3xH | 03H | 04H | 0DH | 0AH |



Printer status

- "00": Normal state
- "01": Cover open state
- "02": Operating
- "04": Pause state
- "05": Wait for strip
- "06": Command syntax error (including Ir packet error)
- "11": Paper jam
- "13": Label end
- "15": Cover open error
- "17": Broken thermal head dots error
- "18": Thermal head excessive temperature
- "19": Ambient temperature error
- "32": Abnormal battery temperature
- "33": Battery excessive temperature
- "36": Low battery
- "37": Charging error
- "38": Bluetooth setting successfully completed  
(Not returned when the Status Request Command is used)
- "39": Bluetooth setup error (including initialization error)
- ("40": Normal issue end)  
Response status for automatic status transmission
- ("41": Normal feed end)  
Response status for automatic status transmission
- "45": Wait for battery recovery
- "46": Wait for print head temperature reduction
- "47": Wait for motor temperature reduction
- "50": Flash ROM write error
- "51": Flash ROM erase error
- "54": Flash ROM storage area full state
- "55": Writable character/PC command save mode

Printer status for the compatible mode for the B-SP series

- "00": Normal state
- "01": Cover open state
- "02": Operating  
including the following statuses: wait for strip, pause state, wait for battery recovery, wait for print head/motor temperature reduction and writable character/PC command save mode
- "06": Command syntax error (including Ir packet error)
- "09": Normal issue end + Label end
- "11": Paper jam
- "13": Label end
- "15": Cover open error
- "17": Broken head dots error
- "18": Thermal head excessive temperature  
including ambient temperature error, abnormal battery temperature, and battery excessive temperature
- "36": Low battery
- "37": Charging error
- "38": Bluetooth setting successfully completed  
(Not returned when the Status Request Command is used)
- "39": Bluetooth setup error (including initialization error)
- ("40": Normal issue end)  
Response status for automatic status transmission
- ("41": Normal feed end)  
Response status for automatic status transmission
- "50": Flash ROM write error
- "51": Flash ROM erase error
- "54": Flash ROM storage area full state

Notes

- (1) The status is returned only to the interface which sent this command.
- (2) A max. delay of 20 msec may occur until the printer sends the status after receiving the Status Request Command.
- (3) The interval from when the Status Request Command is sent to when the next Status Request Command is sent should be 20 msec or more. If the interval is less than 20 msec, the printer may fail to receive the Status Request Command.
- (4) Status "09" is effective only when the compatible mode for the B-SP series is enabled in the SYSTEM mode. In other modes, this status indicates label end.

Example

[ESC] WS [LF] [NUL]

**10.9.2 MODE INFORMATION ACQUIRE COMMAND**

**[ESC] WX**

Function

Sends the printer mode information to the host.

Format

[ESC] WX [LF] [NUL]

Explanation

- (1) Statuses are different between when the compatible mode for the B-SP series is on and when it is off.
- (2) The mode information format to be sent to the host, is as follows:

**[LABEL, RECEIPT, ESC/POS modes]**

[IrDA: TEC Protocol]

|     |                             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |
|     | S                           | Y   | S   | T   | E   | M   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |
| 02H | 53H                         | 59H | 53H | 54H | 45H | 4DH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

|     |                             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|     | S                           | Y   | S   | T   | E   | M   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |
| 02H | 53H                         | 59H | 53H | 54H | 45H | 4DH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H |

**[TPCL mode]**

[IrDA: TEC Protocol]

|     |                             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | CRC | CRC |
|     | S                           | Y   | S   | T   | E   | M   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |
| 02H | 53H                         | 59H | 53H | 54H | 45H | 4DH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | xxH | xxH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, Wireless LAN]

|     |     |                             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| SOH | STX | Mode information (16 bytes) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | ETX | EOT | CR  | LF  |
|     |     | S                           | Y   | S   | T   | E   | M   | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  | SP  |     |     |     |     |
| 01H | 02H | 53H                         | 59H | 53H | 54H | 45H | 4DH | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 20H | 03H | 04H | 0DH | 0AH |

The above shows examples where the message is received in the SYSTEM mode for administrators (after a password is entered, when password setting is on). In addition, the messages described on the following page are returned.

- When the compatible mode for the B-SP series is on.

|                                                        |                                                             |               |
|--------------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                              | TPCL                                                        |               |
| TPCL1 mode                                             | TPCL1                                                       |               |
| LABEL mode                                             | LABEL                                                       |               |
| RECEIPT mode                                           | RECEIPT                                                     |               |
| RECEIPT1 mode                                          | RECEIPT1                                                    |               |
| ESC/POS mode                                           | ESC/POS                                                     |               |
| Online reset menu                                      | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys            | USER ■ SYSTEM                                               |               |
| SYSTEM mode for<br>administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                        | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                        | When the password setting is off                            | SYSTEM        |
| TPCL (strip issue mode)                                | TPCL ■ (S)                                                  |               |
| TPCL1 (strip issue mode)                               | TPCL1 (S)                                                   |               |
| LABEL (strip issue mode)                               | LABEL (S)                                                   |               |

\* ■ indicates a space.

- When the compatible mode for the B-SP series is off.

|                                                        |                                                             |               |
|--------------------------------------------------------|-------------------------------------------------------------|---------------|
| TPCL mode                                              | TPCL-LE                                                     |               |
| TPCL1 mode                                             | TPCL-LE1                                                    |               |
| LABEL mode                                             | LABEL                                                       |               |
| RECEIPT mode                                           | RECEIPT                                                     |               |
| RECEIPT1 mode                                          | RECEIPT1                                                    |               |
| ESC/POS mode                                           | ESC/POS                                                     |               |
| Online reset menu                                      | USER ■ SYSTEM                                               |               |
| SYSTEM mode for users<br>PAUSE + POWER keys            | USER ■ SYSTEM                                               |               |
| SYSTEM mode for<br>administrators<br>FEED + POWER keys | When the password setting is on<br>and before it is entered | USER ■ SYSTEM |
|                                                        | When the password setting is on<br>and after it is entered  | SYSTEM        |
|                                                        | When the password setting is off                            | SYSTEM        |

\* ■ indicates a space.

**10.9.3 PRINTER SERIAL NUMBER ACQUIRE COMMAND [ESC] WY**

**Function** Sends the printer serial number to the host.

**Format** [ESC] WY [LF] [NUL]

**Explanation**

- (1) The format of the printer serial No. to be returned to the host is as follows.

**[LABEL, RECEIPT, ESC/POS modes]**

[IrDA: TEC Protocol]

|     |                    |     |     |
|-----|--------------------|-----|-----|
| STX | Printer serial No. | CRC | CRC |
| 02H | 32 bytes           | XXH | XXH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |                    |
|-----|--------------------|
| STX | Printer serial No. |
| 02H | 32 bytes           |

**[TPCL mode]**

[IrDA: TEC Protocol]

|     |                    |     |     |
|-----|--------------------|-----|-----|
| STX | Printer serial No. | CRC | CRC |
| 02H | 32 bytes           | XXH | XXH |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN]

|     |     |                    |     |     |     |     |
|-----|-----|--------------------|-----|-----|-----|-----|
| SOH | STX | Printer serial No. | ETX | EOT | CR  | LF  |
| 01H | 02H | 32 bytes           | 03H | 04H | 0DH | 0AH |

When the printer serial No. is "2308M000001":

[32H][33H][30H][38H][4DH][30H][30H][30H][30H][30H][31H][00H][00H][00H][00H][00H]  
 2 3 0 8 M 0 0 0 0 0 0 1  
 [00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H][00H]

\* The remaining bytes of 32 bytes are filled with 00H.

**Example** [ESC] WY [LF] [NUL]

## 10.10 COMMANDS RELATED TO BLUETOOTH AND WIRELESS LAN

### 10.10.1 DEVICE ADDRESS ACQUIRE COMMAND

[ESC] IT

**Function** Reads the device address of the Bluetooth or MAC address of the wireless LAN.

**Format** [ESC] IT [LF] [NUL]

**Explanation** (1) This command reads the device address of the Bluetooth or MAC address of the wireless LAN. When using the IrDA, the following information field is placed in the information frame and sent to the Bluetooth or wireless LAN.

#### [LABEL, RECEIPT, ESC/POS modes]

[Information field to be sent when IrDA: TEC Protocol is used]

|     |                          |     |     |
|-----|--------------------------|-----|-----|
| STX | Bluetooth device address | CRC |     |
| 02H | 12 bytes                 | xxH | xxH |

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth or wireless LAN is used]

|     |                          |
|-----|--------------------------|
| STX | Bluetooth device address |
| 02H | 12 bytes                 |

#### [TPCL mode]

[Information field to be sent when IrDA: TEC Protocol is used]

|     |                          |     |     |
|-----|--------------------------|-----|-----|
| STX | Bluetooth device address | CRC |     |
| 02H | 12 bytes                 | xxH | xxH |

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN is used]

|     |     |                          |     |     |     |     |
|-----|-----|--------------------------|-----|-----|-----|-----|
| SOH | STX | Bluetooth device address | ETX | EOT | CR  | LF  |
| 01H | 02H | 12 bytes                 | 03H | 04H | 0DH | 0AH |

The printer sends the following information:

Bluetooth device address: 0001ccf0042b

Bluetooth device address:

[30H] [30H] [30H] [31H] [63H] [63H] [66H] [30H] [30H] [34H] [32H] [62H]  
0 0 0 1 c c f 0 0 4 2 b

**Example** [ESC] IT [LF] [NUL]

### 10.10.2 BLUETOOTH DEVICE NICKNAME SETTING

[ESC] BN

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets Bluetooth device nickname.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Format      | [ESC] BN; aaa...aaa [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Term        | aaa...aaa: Device nickname<br>B-EP-GH30/TH30: Up to 32 bytes<br>B-EP-GH32: Up to 24 bytes<br>Factory default: "TOSHIBATEC BT"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Explanation | <ol style="list-style-type: none"><li>(1) Printer device nickname to be notified to the host is set.</li><li>(2) The device nickname set by this command becomes effective when the printer is restarted after a proper power off of the printer.</li><li>(3) In the LABEL mode (Mode = 0), RECEIPT mode (Mode = 1) or RECEIPT1 mode (Mode = 2), the printer returns "38H" (setting completed) when the processing for the Bluetooth module is completed successfully, and returns "39H" (setting error) when failed. In the TPCL mode (Mode = A) or TPCL1 mode (Mode = B), the printer returns "38" (setting completed) when the setting for the Bluetooth module is completed, and returns "39" (setting error) when failed.</li><li>(4) Characters of 20H to 7FH can be used for a device nickname. For the B-EP-GH32, only the alphanumerals and spaces are accepted.</li><li>(5) Up to 24-byte device nickname can be set for the B-EP-GH32. Setting 25 bytes or more results in a syntax error.</li></ol> |
| Example     | To set "PRINTER" for a device nickname.<br>[ESC] BN; PRINTER [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



### 10.10.3 INQUIRY RESPONSE TIME SETTING COMMAND [ESC] BZ

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets the time for the printer to respond to an inquiry of the Bluetooth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Format      | [ESC] BZ; a [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Term        | <p>a: Inquiry response time</p> <p>0: Inquiry is not possible.</p> <p>1: Inquiry is possible only within 60 seconds after a power on.</p> <p>2: Inquiry is possible ay anytime. (Factory default setting)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Explanation | <p>(1) Time of printer's response to an inquiry from the host is set.</p> <p>0: The printer does not respond to an inquiry from the host.</p> <p>1: The printer responds to an inquiry from the host only within 60 seconds after the power is turned on.</p> <p>2: The printer responds to an inquiry from the host at anytime while the power is on.</p> <p>(2) The response time set by this command becomes effective when the printer is restarted after a proper power off of the printer.</p> <p>(3) When the Bluetooth installed in the printer is replaced, start the printer in the SYSTEM mode, and then, turn the power off. Doing this makes the parameter effective.</p> <p>(4) This command can be sent from either the Bluetooth interface or the IrDA interface. When the printer power is not turned off then on after sending the command via either interface, and command transmission is performed via a different interface, the command may be invalid.</p> <p>(5) In the LABEL mode (Mode = 0), RECEIPT mode (Mode = 1) or RECEIPT1 mode (Mode = 2), the printer returns "38H" (setting completed) when the processing for the Bluetooth module is completed successfully, and returns "39H" (setting error) when failed. In the TPCL mode (Mode = A) or TPCL1 mode (Mode = B), the printer returns "38" (setting completed) when the setting for the Bluetooth module is completed, and returns "39" (setting error) when failed.</p> <p>(6) In the system mode, the B-EP-GH32 does not resond to any inquiry from the master, regardless of this command setting.</p> |
| Example     | <p>To set the response time to "within 60 seconds after a power on".</p> <p>[ESC] BZ; 1 [LF] [NUL]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

#### 10.10.4 INTERVAL/WINDOW SETTING AT THE INQUIRY/PAGE [ESC] BQ

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Sets an interval and window of inquiry/page for the Bluetooth interface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Format      | [ESC] BQ; aaaa, bbbb [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Term        | <p>aaaa: Interval of an inquiry/page (Fixed at 4 digits)<br/>0018 to 4096 (0.625 msec./unit)<br/>Factory default setting (inquiry/page): 2048 ⇒ 1.28 sec</p> <p>bbbb: Window of an inquiry/page (Fixed at 4 digits)<br/>0018 to 4096 (0.625 msec./unit)<br/>Factory default setting (inquiry/page): 0036 ⇒ 22.5 msec</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Explanation | <ol style="list-style-type: none"> <li>(1) An interval and window related to the time for the printer to respond to an inquiry or page from the host are set. When the printer is used in the environment where a connection with the host takes time, the connectivity will be improved by making the value of the interval smaller and the window larger.</li> <li>(2) When the value of the interval is set smaller and the window larger for improving the connectivity, the printer's power consumption will be increased. Also, compared with the printer which is used with the factory default setting, the standby time and the number of issues will be decreased.</li> <li>(3) This setting becomes effective when the printer is restarted after the parameter is set and the printer power is turned off properly.</li> <li>(4) In the LABEL mode (Mode = 0), RECEIPT mode (Mode = 1) or RECEIPT1 mode (Mode = 2), the printer returns "38H" (setting completed) when the processing for the Bluetooth module is completed successfully, and returns "39H" (setting error) when failed. In the TPCL mode (Mode = A) or TPCL1 mode (Mode = B), the printer returns "38" (setting completed) when the setting for the Bluetooth module is completed, and returns "39" (setting error) when failed.</li> <li>(5) When the value of the interval is smaller than the value of the window, the printer returns "39" (setting error).</li> <li>(6) In the case of the B-EP-GH32, when a value ranging from 4081 to 4096 is set, it will be rounded to 4080 by the printer firmware.</li> </ol> |
| Example     | <p>To set the interval to 640 msec. and the window to 45.0 msec.</p> <p>[ESC] BQ; 1024, 0072 [LF] [NUL]</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**10.10.5 BONDING SETTING COMMAND**

**[ESC] BP**

|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function | Sets the destination and the PIN code (bonding setting) of the Bluetooth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Format   | [ESC]BP; aaaaaaaaaaaa, b, ccccccccccccccccccccccccccccccccc [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Term     | <p>aaaaaaaaaaaa: Bluetooth device address (BD address) of the destination</p> <p>B-EP-GH30/TH30:</p> <p>(1) 12-byte ASCII characters (hex. code) "0" to "9" and "A" to "F"<br/>(in the case of BD address of specific destination)</p> <p>(2) 12 bytes of "*" (in the case of BD address of unspecified destination)</p> <p>B-EP-GH32:</p> <p>Only 12 bytes of "*" (in the case of BD address of unspecified destination) are accepted.</p> <p>b: Size of PIN code</p> <p>0: 1 byte</p> <p>1: 2 bytes</p> <p>2: 3 bytes</p> <p style="text-align: center;">:</p> <p>D: 14 bytes</p> <p>E: 15 bytes</p> <p>F: 16 bytes</p> <p>c: PIN code</p> <p>Byte string corresponding to the PIN code size is set in ASCII.</p> |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explanation | <p>(1) In the LABEL mode (Mode = 0), RECEIPT mode (Mode = 1) or RECEIPT1 mode (Mode = 2), the printer returns "38H" (setting completed) when the processing for the Bluetooth module is completed successfully, and returns "39H" (setting error) when failed. In the TPCL mode (Mode = A) or TPCL1 mode (Mode = B), the printer returns "38" (setting completed) when the setting for the Bluetooth module is completed, and returns "39" (setting error) when failed.</p> <p>(2) Up to 10 BD addresses can be set by this command. If 11th BD address is set, the first one is automatically deleted.</p> <p>(3) If the PIN code is changed without changing BD address, the previously registered PIN code is voided, and the latest one becomes effective.</p> <p>(4) When a 12-digit "*" is set to a specific destination, the previously set BD address of that destination becomes invalid.</p> <p>(5) To set a BD address for a specific designation after an address for unspecified destination has been set, it is required to delete all bonding table by a Bonding Table Deletion Command.</p> <p>(6) The PIN code of the unspecified destination can be changed without deleting all the bonding table.</p> <p>(7) This command is effective only when the power is turned on in the SYSTEM mode. It is invalid when the SYSTEM mode is entered by using the System Mode Shift Command.</p> |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- (8) This command can be sent from either the Bluetooth interface or the IrDA interface. When the printer power is not turned off then on after sending the command via either interface, and command transmission is performed via a different interface, the command may be invalid.
- (9) Both uppercase and lowercase letters are effective as ASCII codes for "A" to "F" in the BD address of the destination.
- (10) Alphanumeric characters of "0" to "9," "A" to "Z," and "a" to "z" can be used for a PIN code.
- (11) The B-EP-GH32 only accepts 12 bytes of "\*" (in the case of BD address of unspecified destination) as BD address of the destination. If 12-byte ASCII characters, "0" to "9" and "A" to "F" (in the case of BD address of specific destination), are set, a syntax error occurs and the BD address is not set.

Example

To set the BD address of destination to "00043e0101ef" and PIN code to "3A" with PIN code size to 1 (2 bytes):

As the PIN code "3A" corresponds to 0x33,0x41 in ASCII, the command will be:  
[ESC] BP; 00043e0101ef, 1, 3341 [LF] [NUL]

**10.10.6 BONDING TABLE DELETION COMMAND**

**[ESC] BE**

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Function    | Deletes the bonding table of the Bluetooth.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Format      | [ESC] BE; aaaaaaaaaa [LF] [NUL]<br>[ESC] BE; b [LF] [NUL]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Term        | <p>aaaaaaaaaa: Bluetooth device address (BD address)<br/>12-byte ASCII (hex. code) "0" to "9," "A" to "F"</p> <p>b: Delete all (all registered bonding tables)<br/>1-byte "*" (fixed)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Explanation | <ol style="list-style-type: none"> <li>(1) This command deletes not only the bonding table of designated BD address but the link between the bonding table and the BD address.</li> <li>(2) In the LABEL mode (Mode = 0), RECEIPT mode (Mode = 1) or RECEIPT1 mode (Mode = 2), the printer returns "38H" (setting completed) when the processing for the Bluetooth module is completed successfully, and returns "39H" (setting error) when failed. In the TPCL mode (Mode = A) or TPCL1 mode (Mode = B), the printer returns "38" (setting completed) when the setting for the Bluetooth module is completed, and returns "39" (setting error) when failed.</li> <li>(3) An error status is returned when the designated BD address does not exist in the bonding table, as well as a deletion of the table from the flash ROM cannot be performed properly.</li> <li>(4) When "Delete all (*)" is designated, the registered BD addresses are all deleted. When the BD address of unspecified destination was set in the bonding setting, they can be deleted only by designating "Delete all."<br/>To set BD address of specific destination again, it is required to execute a "Delete all" by this command.</li> <li>(5) This command is effective only when the power is turned on in the SYSTEM mode. It is invalid when the SYSTEM mode is entered by using the System Mode Shift Command.</li> <li>(6) This command can be sent from either the Bluetooth interface or the IrDA interface. When the printer power is not turned off then on after sending the command via either interface, and command transmission is performed via a different interface, the command may be invalid.</li> <li>(7) Both uppercase and lowercase letters are effective as ASCII codes for "A" to "F" in the BD address of the destination.</li> </ol> |

**10.10.7 SECURITY SETTING COMMAND**

**[ESC] BS**

**Function** Performs the security setting for the Bluetooth.

**Format** [ESC] BS; a [LF] [NUL]

**Term** a: Security setting  
           1: No security (Factory default setting)  
           2: Reserved.  
           3: Link level security

- Explanation**
- (1) In the LABEL mode (Mode = 0), RECEIPT mode (Mode = 1) or RECEIPT1 mode (Mode = 2), the printer returns "38H" (setting completed) when the processing for the Bluetooth module is completed successfully, and returns "39H" (setting error) when failed. In the TPCL mode (Mode = A) or TPCL1 mode (Mode = B), the printer returns "38" (setting completed) when the setting for the Bluetooth module is completed, and returns "39" (setting error) when failed.
  - (2) In the system mode, "No security" is designated regardless of this security setting. In addition, Bluetooth connection is not enabled on the B-EP-GH32 in the system mode.
  - (3) This setting becomes effective when the printer is restarted after the parameter is set and the printer power is turned off properly.
  - (4) When "2: Reserved" is specified, the Bluetooth module functions without security.
  - (5) Security setting and bonding

B-EP-GH30/TH30:

The Bluetooth module functions as follows regardless of the Bluetooth version of the host.

| Bonding setting | Security setting    | Operation                     |
|-----------------|---------------------|-------------------------------|
| Unregistered    | None                | Functions without a PIN code. |
| Unregistered    | Link level security | Not connectable.              |
| Registered      | None                | Functions without a PIN code. |
| Registered      | Link level security | Functions with a PIN code.    |

B-EP-GH32:

When the Bluetooth version of the host is V2.0 or before, link level security (with PIN code) is implemented regardless of the security setting.

When the Bluetooth version of the host is V2.1 or later, SSP is implemented regardless of the security setting.

| Bonding setting             | Security setting         | Bluetooth version of the host | Operation                        |
|-----------------------------|--------------------------|-------------------------------|----------------------------------|
| Unregistered                | None                     | V2.0 or before                | Default PIN code "1234" is used. |
| Unregistered                | Link level security      |                               | Default PIN code "1234" is used. |
| Registered                  | None                     |                               | Registered PIN code is used.     |
| Registered                  | Link level security      |                               | Registered PIN code is used.     |
| Unregistered/<br>Registered | None/Link level security | V1.2 + EDR or later           | SSP is implemented.              |

Example

To set the security to the link level.  
 [ESC] BS; 3 [LF] [NUL]

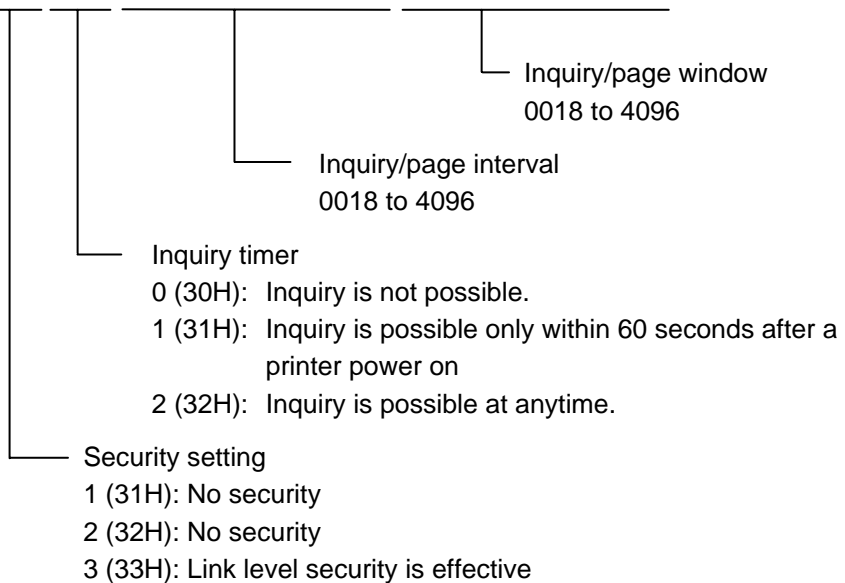
### 10.10.8 BLUETOOTH RELATED PARAMETER ACQUIRE COMMAND [ESC] WT

- Function** Acquires the parameter settings related to the Bluetooth.
- Format** [ESC] WT [LF] [NUL]
- Explanation** This command reads the parameters related to the Bluetooth. When using the IrDA, the following information field is placed in the information frame and sent to the host.

■ LABEL, RECEIPT, ESC/POS modes

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |



| Bluetooth device name | CRC | CRC |
|-----------------------|-----|-----|
| 32 bytes              | xxH | xxH |

Bluetooth device name: Fixed at 32 bytes.

When the Bluetooth device name is "TOSHIBA TEC BT."

[54H] [4FH] [53H] [48H] [49H] [42H] [41H] [20H] [54H] [45H] [43H] [20H] [42H] [54H] [00H] [00H]  
T O S H I B A ' T E C ' B T  
[00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H]

\* When the Bluetooth device name is less than 32 bytes, the remaining bytes are filled with 00H.

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, or Bluetooth is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |  |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|--|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH |  |

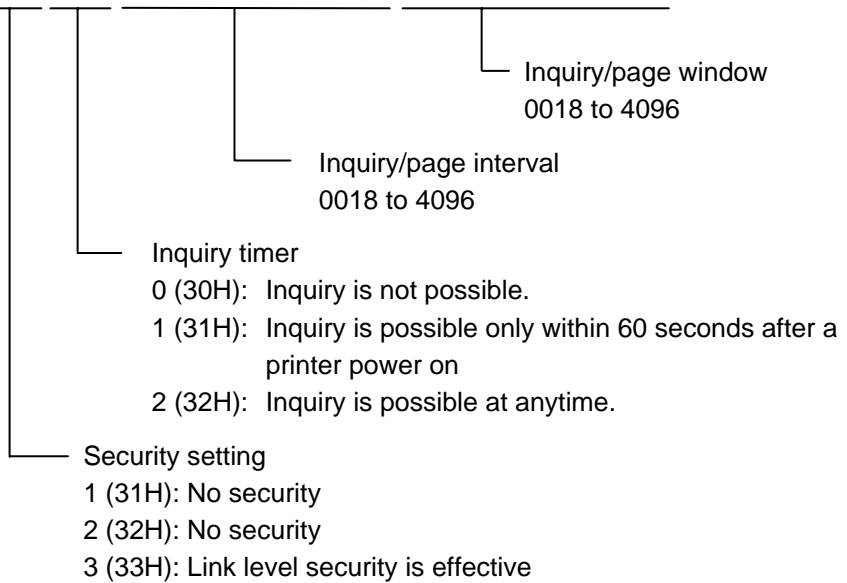
| Bluetooth device name |
|-----------------------|
| 32 bytes              |



■ TPCL mode

[Information field to be sent when IrDA: TEC Protocol is used]

| STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |



|                       |     |     |
|-----------------------|-----|-----|
| Bluetooth device name | CRC | CRC |
| 32 bytes              | xxH | xxH |

Bluetooth device name: Fixed at 32 bytes.

When the Bluetooth device name is "TOSHIBA TEC BT."

[54H] [4FH] [53H] [48H] [49H] [42H] [41H] [20H] [54H] [45H] [43H] [20H] [42H] [54H] [00H] [00H]  
T O S H I B A ' T E C ' B T  
[00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H] [00H]

\* When the Bluetooth device name is less than 32 bytes, the remaining bytes are filled with 00H.

[Information field to be sent when IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, or Bluetooth is used]

| SOH | STX | Sec | Inq | Interval |     |     |     | Window |     |     |     |
|-----|-----|-----|-----|----------|-----|-----|-----|--------|-----|-----|-----|
| 01H | 02H | 3xH | 3xH | 3xH      | 3xH | 3xH | 3xH | 3xH    | 3xH | 3xH | 3xH |

|                       |     |     |     |     |
|-----------------------|-----|-----|-----|-----|
| Bluetooth device name | ETX | EOT | CR  | LF  |
| 32 bytes              | 03H | 04H | 0DH | 0AH |

## 10.11 SETUP MODE

### 10.11.1 GENERAL DESCRIPTION

The settings can be changed not only by commands but also by the key operations from the printer. This section describes how to change the settings by the key operations from the printer.

### 10.11.2 HOW TO ENTER INTO SETUP MODE

The [POWER] key is pressed while holding down the [FEED] or [PAUSE] key.

### 10.11.3 AUTO POWER-OFF FUNCTION DURING SETTING

Not performed.

### 10.11.4 HOW TO CHECK EACH SETUP MODE

Setup mode check is conducted by printing self-test results.

\* For details, refer to the Key Operation Specification.

### 10.11.5 OTHER

The printer does not enter into the power save mode during the setup mode.

If the setting is the same as before, it is not written into flash ROM.

Settings made take effect, after the printer is turned OFF then ON by pressing the [POWER] key in the SYSTEM mode, or when the printer is restarted by the Reset Command.

## **11. OTHER FUNCTIONS**

### **11.1 GENERAL DESCRIPTION**

This chapter describes details regarding the individual functions of the printer.

## 11.2 REPRINT FUNCTION

### 11.2.1 LABEL MODE

When the batch issue mode is selected, the same label as the last one issued is printed out by pressing the [FEED] key. When the [FEED] key is pressed if no label has been printed, the specified label pitch length of one label is fed. (If no sensor is designated, a 20-mm feed is performed.)

In the strip issue mode, the specified number of labels is issued regardless of whether the compatible mode for the B-SP series is enabled or not.

If an error occurs, the drawing buffer data is kept until the next Data Print Command is received. Therefore, after the error is cleared, if the reprint key is enabled in the Data Print Command, one label can be issued every time the [FEED] key is pressed.

### 11.2.2 RECEIPT OR ESC/POS MODE

A label is not issued again. A 20-mm feed is performed every time the [FEED] key is pressed.

### 11.2.3 TPCL MODE

A label is not issued again. The specified label pitch length of a feed is performed every time the [FEED] key is pressed. (If no sensor is designated, a 20-mm feed is performed.)

### 11.2.4 TPCL1 MODE

When the batch issue mode is selected, the same label as the last one issued is printed out by pressing the [FEED] key. When the [FEED] key is pressed if no label has been printed, the specified label pitch length of one label is fed. (If no sensor is designated, a 20-mm feed is performed.)

If an error occurs, key entries are ignored. However, the drawing buffer data is kept until the next Data Print Command is received. Therefore, after the error is cleared, one label can be issued every time the [FEED] key is pressed.

## 11.3 POWER SAVE MODE

This printer will enter the power save mode after the printer has been in an idle state for the specified 'time to the power save mode' to save the power consumption. When the printer enters the power save mode, all data in the receive buffer is cleared. During an error state (including a low battery state), the printer does not enter the power save mode, but turns off according to the auto power off time setting. If the auto power off time is set to 5 minutes or longer, however, the printer will turn off in 5 minutes.

The power save mode is cleared when:

- The IrDA link is established. (TEC Protocol, IrCOMM)
- A USB cable is connected, and USB communications are started.
- RS-232C communications are started.
- Bluetooth communications are started.
- Wireless LAN communications are started.
- The cover is closed.
- The [FEED] key is pressed.
- The [POWER] key is pressed.

\* A time period until the printer enters the power save mode varies depending on the setting (1 to 30 seconds.)

## 11.4 AUTOMATIC LABEL PRINT POSITIONING

### 11.4.1 LABEL MODE, TPCL MODE

When the cover is closed, the label is automatically fed to the first print position. However, if no sensor is designated, a feed is not performed.

### 11.4.2 RECEIPT MODE

Even if the cover is closed, the label is not automatically fed to the first print position.

## 11.5 CONTINUOUS PRINTING FUNCTION

### 11.5.1 LABEL MODE, RECEIPT MODE (Mode = 1)

The continuous printing function is not supported. When an error occurs, the receive buffer is entirely cleared.

### 11.5.2 RECEIPT1 MODE (Mode = 2), TPCL MODE (Mode = A), TPCL1 MODE (Mode = B), ESC/POS MODE (Mode = 4)

After the label end error or the cover open error is cleared, the printer automatically continues printing the data which has been received before the error occurred. After paper is replaced, the error is cleared by pressing the [PAUSE] key. Then, the printer automatically continues printing. If the sensor is designated, the printer performs a feed to position the label at the first print position, then continues printing. When the cover is closed, if the printer has run out of the paper, the printer neither clears the error nor continues printing. It remains in the error state.

## 11.6 AUTOMATIC LABEL PRINT POSITIONING AT POWER ON TIME

### 11.6.1 DESTINED FOR JAPAN

Not applicable.

### 11.6.2 DESTINED OVERSEAS

If the sensor is designated, and if the transmissive sensor detects the backing paper of the label, the printer performs a feed to position the label at the first print position. Note that this is not done without the sensor adjustment.

In addition, even if the paper is not loaded, the printer will recognize that as the backing paper, and this will result in the label end error.

## 11.7 BD ADDRESS PRINTING FUNCTION

When the printer which supports Bluetooth interface is turned ON by holding down the [POWER] key, the barcode below is printed, regardless of the print mode. However, if the barcode is not properly printed due to an error caused by the label end or paper jam, the printer does not reprint it. Clear the error, and then try to reprint it by performing the procedure from the beginning (the power off state).


[Barcode sample of Bluetooth device address]



## 11.8 WIRELESS LAN PARAMETER SETTINGS PRINTING FUNCTION

When the printer which supports the wireless LAN is turned ON by holding down the [POWER] key while the power is off, the printer prints a wireless LAN parameter settings label regardless of the issue mode. If the label is not printed successfully due to an error like no paper or feed jam, it is required to load the media correctly, turn off the power, and then retry from the beginning. This is because the printer will not reprint the label even if the error is cleared.

[Sample of the wireless LAN parameter setting printout (B-EP2DL)]

|                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------|-----------|
| RF-LAN PARAMS                                                                                       | TYPE[JPN] |
| IP [192.168.254.254]                                                                                | LPD [ON ] |
| GW [000.000.000.000]                                                                                | DHCP[ON ] |
| SUB[255.255.000.000]                                                                                | CON [INF] |
| SOCK[ON ][08000]                                                                                    |           |
| HOST [                                                                                              | ]         |
| [                                                                                                   | ]         |
| ESSID [TOSHIBATEC                                                                                   | ]         |
| [                                                                                                   | ]         |
| MAC:00-0e-10-10-3c-4d                                                                               |           |
| WLAN Ver1.0.1                                                                                       |           |
| <br>192168254254 |           |

## 11.9 STRIP ISSUE MODE

- (1) In TPCL mode (mode =A), TPCL1 mode (mode = B), or LABEL mode (mode = 0), the specified number of labels are printed. Note that a next print job is not performed until the printed label is removed from the strip shaft.

\* If the [FEED] key is pressed in the “strip wait” status, stripping will be performed forcibly. (In other words, this is the same state as the media is removed.)

- (2) Please refer to the following commands related to the strip issue mode:

- Mode Select Command
- Position Fine Adjustment Command
- Strip Sensor Threshold Value Set Command (TPCL mode)
- Strip Sensor Adjust Command (LABEL mode)
- Issue Command
- Mode Information Acquire Command

## 11.11 STATUS

### 11.11.1 FUNCTIONS

The printer has the status response functions as listed below:

- (1) Status transmission at the end of a normal issue or in the event of the occurrence of an error (automatic status transmission)

This function is available for IrDA: IrCOMM, IrDA: TEC Protocol, USB, RS-232C and Bluetooth interfaces, or socket communications (during connection).

If the option “status response is returned.” has been selected (and if the automatic status transmission is enabled for the IrDA: IrCOMM or USB interface), the printer sends the status to the host computer when the printer completes an issue normally. (For the batch/cut mode: after the designated number of labels has been printed. For the strip mode: after one label has been printed.)

When an error occurs, the status is sent to the host computer.

The remaining count included in the status response indicates the remaining print count of the batch currently in progress only. No remaining count of the batch waiting to be printed is transmitted.

- (2) Status transmission in response to a status request (Status Request Command)

This function is available for IrDA: IrCOMM, IrDA: TEC Protocol, IrDA: IrOBEX, RS-232C, USB and Bluetooth interfaces, or socket communications.

Upon receipt of the Status Request Command, the printer sends the latest status indicating its current state to the host computer, regardless of the status response parameter setting (and regardless of whether the automatic status transmission is enabled for the IrDA: IrCOMM or USB interface). The remaining count indicates the remaining print count of the batch currently in progress only. No remaining count of the batch waiting to be printed is transmitted. This command is not stored in the receive buffer, but executed immediately after received.

- (3) Receive buffer free space status transmission in response to a status request (Receive Buffer Free Space Status Request Command)

This function is available for IrDA: IrCOMM, IrDA: TEC Protocol, IrDA: IrOBEX, RS-232C, USB and Bluetooth interfaces, or socket communications.

Upon receipt of the Receive Buffer Free Space Status Request Command, the printer sends the latest status indicating its current state and free space of the receive buffer to the host computer, regardless of the status response parameter setting (and regardless of whether the automatic status transmission is enabled for the IrDA: IrCOMM or USB interface). The remaining count indicates the remaining print count of the batch currently in progress only. No remaining count of the batch waiting to be printed is transmitted. This command is not stored in the receive buffer, but executed immediately after received.

- Strip wait status

If the Status Request Command is sent while printing is being attempted using the [FEED] key and a label is on the strip shaft (for example, while idling, after feeding a label, or after printing all specified number of labels), the printer returns the strip wait status to the host. If the Status Request Command is sent while a label is being printed or issued, the strip wait status is returned.

- Status in ESC/POS mode

Similarly, a response is returned to the Status Request command commonly used by the B-EP series in ESC/POS mode.

However, any status transmission will not be performed after the completion of printing as described in (1) above and when an error occurs.

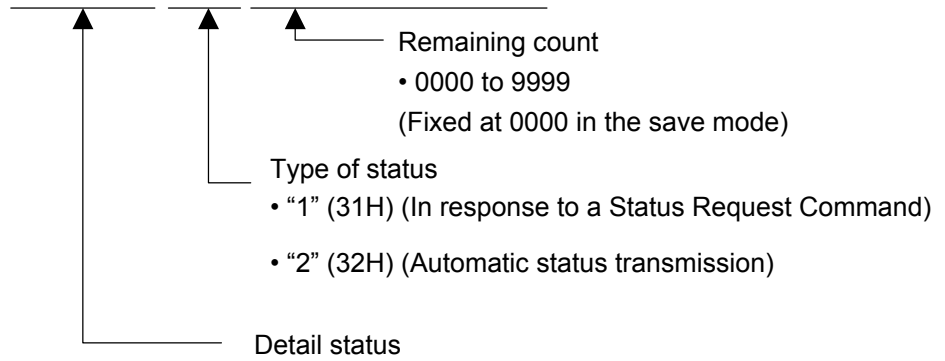


### 11.11.2 STATUS FORMAT

- TPCL Mode

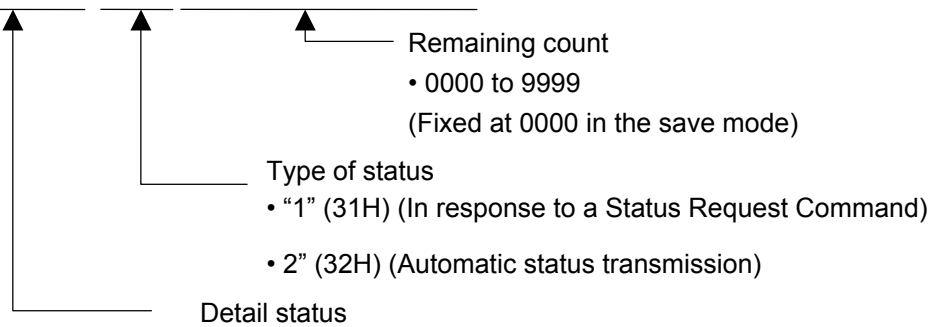
[IrDA: TEC Protocol]

| STX | ID  | ID  | Status |     |     | Remaining count |     |     |     | CRC | CRC |
|-----|-----|-----|--------|-----|-----|-----------------|-----|-----|-----|-----|-----|
| 01H | XXH | XXH | 3XH    | 3XH | 3XH | 3XH             | 3XH | 3XH | 3XH | XXH | XXH |



[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN interface]

| SOH | STX | Status |     |     | Remaining count |     |     |     | ETX | EOT | CR  | LF  |
|-----|-----|--------|-----|-----|-----------------|-----|-----|-----|-----|-----|-----|-----|
| 01H | 02H | 3XH    | 3XH | 3XH | 3XH             | 3XH | 3XH | 3XH | 03H | 04H | 0DH | 0AH |



- LABEL, RECEIPT, or ESC/POS Mode

[IrDA: TEC Protocol] Data to be transmitted (fixed at 27 bytes)

| STX | Printer ID |     | Version No. of each form |     |       |     | Printer status | Battery status | CRC |     |
|-----|------------|-----|--------------------------|-----|-------|-----|----------------|----------------|-----|-----|
| 02H | xxH        | xxH | V01                      | V02 | ..... | V20 | xxH            | xxH            | xxH | xxH |

[IrDA :IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN interface]

Data to be transmitted (fixed at 5 bytes)

| STX | Printer ID |     | Printer status | Battery status |
|-----|------------|-----|----------------|----------------|
| 02H | xxH        | xxH | xxH            | xxH            |

Printer ID : 2-byte hex data (from High to Low)

Printer status : 1-byte data representing the printer status

Battery status : A battery charging condition is represented in 5 levels.

CRC : 2-byte hex data(from Low to High)

Status to be returned in response to the Receive Buffer Free Space Status Request Command

Commonly used in all modes (TPCL, TPCL1, LABEL, RECEIPT, RECEIPT1, or ESC/POS)

[IrDA: TEC Protocol]

Status after [ESC] WB [LF] [NUL] (22 bytes)

|                              |     |                                                                                                                                                             |
|------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STX                          | 02H | Header of the status block                                                                                                                                  |
| Status                       | 3XH | Printer status                                                                                                                                              |
|                              | 3XH | * Details are described later.                                                                                                                              |
| Status type                  | 33H | This indicates a status with free space of the receive buffer included                                                                                      |
| Remaining count              | 3XH | Remaining print count<br>"0000" (0 label/tag) to "9999"(9999 labels/tags)                                                                                   |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
| Length                       | 32H | Total number of bytes of this status block                                                                                                                  |
|                              | 32H | "22" (22 bytes)                                                                                                                                             |
| Free space of receive buffer | 3XH | Free space of the receive buffer<br>"00000" (0K byte) to "00512" (512K bytes)<br>However, the maximum value should be equal to the receive buffer capacity. |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
| Receive buffer capacity      | 30H | Receive buffer capacity<br>"00512"(512K bytes)                                                                                                              |
|                              | 30H |                                                                                                                                                             |
|                              | 35H |                                                                                                                                                             |
|                              | 31H |                                                                                                                                                             |
|                              | 32H |                                                                                                                                                             |
| CRC                          | XXH | Footer of the status block                                                                                                                                  |
| CRC                          | XXH |                                                                                                                                                             |

[IrDA: IrCOMM, IrDA: IrOBEX, USB, RS-232C, Bluetooth, or wireless LAN interface]

Status after [ESC] WB [LF] [NUL] (23 bytes)

|                              |     |                                                                                                                                                             |
|------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOH                          | 01H | Header of the status block                                                                                                                                  |
| STX                          | 02H |                                                                                                                                                             |
| Status                       | 3XH | Printer status                                                                                                                                              |
|                              | 3XH | * Details are described later.                                                                                                                              |
| Status type                  | 33H | This indicates a status with free space of the receive buffer included.                                                                                     |
| Remaining count              | 3XH | Remaining print count<br>"0000" (0 label/tag) to "9999"(9999 labels/tags)                                                                                   |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
| Length                       | 32H | Total number of bytes of this status block                                                                                                                  |
|                              | 33H | "23" (23 bytes)                                                                                                                                             |
| Free space of receive buffer | 3XH | Free space of the receive buffer<br>"00000" (0K byte) to "00512" (512K bytes)<br>However, the maximum value should be equal to the receive buffer capacity. |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
|                              | 3XH |                                                                                                                                                             |
| Receive buffer capacity      | 30H | Receive buffer capacity<br>"00512"(512K bytes)                                                                                                              |
|                              | 30H |                                                                                                                                                             |
|                              | 35H |                                                                                                                                                             |
|                              | 31H |                                                                                                                                                             |
|                              | 32H |                                                                                                                                                             |
| CR                           | 0DH | Footer of the status block                                                                                                                                  |
| LF                           | 0AH |                                                                                                                                                             |

### 11.11.3 DETAIL STATUS

[The compatible mode for the B-SP series is off.]

\* The values in the upper cell are provided for LABEL/RECEIPT mode (1 byte HEX).

The values in the lower cell are provided for TPCL mode (2 bytes ASCII).

| No. | LCD Message of the Upper Line (English) | Printer Status                                                                                                   | Detail Status            |                        |
|-----|-----------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
|     |                                         |                                                                                                                  | Auto Status Transmission | Status Request Command |
| 1   | ON LINE                                 | The printer is in the online mode.                                                                               |                          | 00H<br>"00"            |
|     | ON LINE                                 | The printer is in the online mode (or communicating).                                                            |                          | 0BH<br>"02"            |
|     | LBL PRESENT ****                        | A label is waiting to be stripped.                                                                               |                          | 0FH<br>"05"            |
|     | ON LINE                                 | A label issue has been completed normally.                                                                       | 10H *1<br>"40"           |                        |
|     | ON LINE                                 | A feed has been completed normally.                                                                              |                          |                        |
|     | ON LINE                                 | A head broken dots check has been completed normally.                                                            |                          |                        |
|     | ON LINE                                 | Initialization has been completed normally.                                                                      | 00<br>10H                |                        |
| 2   | COVER OPEN                              | The front cover was opened in the online mode.                                                                   |                          | 01H<br>"01"            |
| 3   | PAUSE ****                              | The printer is in a pause state.                                                                                 |                          | 14H<br>"04"            |
| 4   | COMMS ERROR                             | A parity error, overrun error, or framing error has occurred during communication through the RS-232C interface. | 0CH                      | 0CH                    |
| 5   | PAPER JAM ****                          | A paper jam has occurred during a paper feed.                                                                    | 03H<br>"11"              | 03H<br>"11"            |
| 6   | NO PAPER ****                           | The paper has run out.                                                                                           | 04H<br>"13"              | 04H<br>"13"            |
| 7   | NO PAPER                                | A label has been completed normally, and then the paper has run out.                                             | 0DH<br>"09"              | 0DH<br>"09"            |
| 8   | COVER OPEN ****                         | An attempt was made to feed or issue with the cover opened (except the [PAUSE] key).                             | 05H<br>"15"              | 05H<br>"15"            |
| 9   | HEAD ERROR                              | A broken element has been found on the thermal head.                                                             | 06H<br>"17"              | 06H<br>"17"            |
| 10  | EXCESS HEAD TEMP                        | The print head temperature has exceeded 71 °C.                                                                   | 07H<br>"18"              | 07H<br>"18"            |
| 11  | SAVING ##### &&&&                       | The printer is in writable character or PC command save mode.                                                    |                          | 55H<br>"55"            |
| 12  | FORMAT ERROR                            | An erase error has occurred in formatting the flash memory.                                                      | 09H<br>"51"              | 09H<br>"51"            |
| 13  | FLASH WRITE ERR.                        | An error has occurred in writing data into the flash memory.                                                     | 08H<br>"50"              | 08H<br>"50"            |

| No. | LCD Message of the Upper Line (English)           | Printer Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Detail Status            |                        |
|-----|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
|     |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Auto Status Transmission | Status Request Command |
| 14  | <b>FLASH MEM FULL</b>                             | Saving failed because of insufficient space in the flash memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0EH<br>"54"              | 0EH<br>"54"            |
| 15  | <b>EEPROM ERROR</b>                               | A back-up EEPROM cannot be read/written properly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                        |
| 16  | <b>LOW BATTERY</b>                                | The battery voltage has dropped to 7.2V or less for B-EP2DL, or 14V or less for B-EP4DL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0AH<br>"36"              | 0AH<br>"36"            |
| 17  | <b>AMBIENT TEMP ERR</b>                           | An ambient temperature has dropped to -20 °C or lower, or exceeded 60 °C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 19H<br>"19"              | 19H<br>"19"            |
| 18  | <b>BATT. TEMP ERROR</b>                           | The battery may be heated and hurt operators. Please be careful not to get burned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 32H<br>"32"              | 32H<br>"32"            |
| 19  | <b>HIGH VOLT. ERROR</b>                           | The battery may be heated and hurt operators.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 33H<br>"33"              | 33H<br>"33"            |
| 20  | <b>SYSTEM ERROR --</b>                            | System error<br>(a) A command has been fetched from an odd address.<br>(b) Word data has been accessed from a place other than the boundary of the word data.<br>(c) Long word data has been accessed from a place other than the boundary of the long word data.<br>(d) The logical area ranging from 80000000H to FFFFFFFFH has been accessed in user mode.<br>(e) An undefined command in a place other than the delay slot has been decoded.<br>(f) An undefined command in the delay slot has been decoded.<br>(g) A command which rewrites the data in the delay slot has been decoded. |                          |                        |
| 21  | <b>WAITING (BATT.)</b>                            | The battery protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          | 45H<br>"45"            |
| 22  | <b>WAITING (HEAD)</b>                             | The print head protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          | 46H<br>"46"            |
| 23  | <b>WAITING (MOTOR)</b>                            | The motor protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          | 47H<br>"47"            |
| 24  | <b>BT INIT ERROR</b>                              | The initialization of Bluetooth failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          | 39H<br>"39"            |
| 25  | <b>BT SETTING ERROR</b>                           | There is an error in the Bluetooth setting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                          | 39H<br>"39"            |
| 26  | <b>CHARGE ERROR \$</b>                            | An error occurred while the battery was recharged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 37H<br>"37"              | 37H<br>"37"            |
| 27  | <b>Ir PACKET ERROR</b>                            | A block number error occurred in the TEC protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 02H<br>"06"              | 02H<br>"06"            |
| 28  | Display of error command<br>(See <b>NOTE 1.</b> ) | A command error has been found in analyzing the command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 02H<br>"06"              | 02H<br>"06"            |

| No. | LCD Message of the Upper Line (English) | Printer Status                                                                                         | Detail Status            |                        |
|-----|-----------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
|     |                                         |                                                                                                        | Auto Status Transmission | Status Request Command |
| 29  | <b>BT Initializing</b>                  | BD address and bonding information are being registered.                                               |                          |                        |
| 30  | <b>SSP AUTH FAILED</b> *2               | Bluetooth pairing failed. (This message is displayed when SSP authentication is rejected by the host.) |                          | 00H<br>"00"            |

\*1 LABEL mode only (when connected through the RS-232C, IrCOMM or Bluetooth interface)

\*2 No. 30: "SSP AUTH FAILED" is displayed only when the printer model is B-EP-GH32 and SSP authentication type is set to "Display Only" or "Display Yes/No" of Numeric Comparison.

[The compatible mode for the B-SP series is on.]

\* The values in the upper cell are provided for LABEL/RECEIPT mode (1 byte HEX).

The values in the lower cell are provided for TPCL mode (2 bytes ASCII).

| No. | LCD Message of the Upper Line (English) | Printer Status                                                                                                   | Detail Status            |                        |
|-----|-----------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
|     |                                         |                                                                                                                  | Auto Status Transmission | Status Request Command |
| 1   | ON LINE                                 | The printer is in the online mode.                                                                               |                          | 00H<br>"00"            |
|     | ON LINE                                 | The printer is in the online mode (or communicating).                                                            |                          | 0BH<br>"02"            |
|     | LBL PRESENT ****                        | A label is waiting to be stripped.                                                                               |                          | 0BH<br>"02"            |
|     | ON LINE                                 | A label issue has been completed normally.                                                                       | 10H *1<br>"40"           |                        |
|     | ON LINE                                 | A feed has been completed normally.                                                                              |                          |                        |
|     | ON LINE                                 | A head broken dots check has been completed normally.                                                            | 00                       |                        |
|     | ON LINE                                 | Initialization has been completed normally.                                                                      | 10H                      |                        |
| 2   | COVER OPEN                              | The front cover was opened in the online mode.                                                                   |                          | 01H<br>"01"            |
| 3   | PAUSE ****                              | The printer is in a pause state.                                                                                 |                          | 0BH<br>"02"            |
| 4   | COMMS ERROR                             | A parity error, overrun error, or framing error has occurred during communication through the RS-232C interface. | 0CH                      | 0CH                    |
| 5   | PAPER JAM ****                          | A paper jam has occurred during a paper feed.                                                                    | 03H<br>"11"              | 03H<br>"11"            |
| 6   | NO PAPER ****                           | The paper has run out.                                                                                           | 04H<br>"13"              | 04H<br>"13"            |
| 7   | NO PAPER                                | A label has been completed normally, and then the paper has run out.                                             | 0DH<br>"09"              | 0DH<br>"09"            |
| 8   | COVER OPEN                              | An attempt was made to feed or issue with the cover opened (except the [PAUSE] key).                             | 05H<br>"15"              | 05H<br>"15"            |
| 9   | HEAD ERROR                              | A broken element has been found on the thermal head.                                                             | 06H<br>"17"              | 06H<br>"17"            |
| 10  | EXCESS HEAD TEMP                        | The print head temperature has exceeded 71 °C.                                                                   | 07H<br>"18"              | 07H<br>"18"            |
| 11  | ON LINE                                 | The printer is in writable character or PC command save mode                                                     |                          | 0BH<br>"02"            |
| 12  | FORMAT ERROR                            | An erase error has occurred in formatting the flash memory.                                                      | 09H<br>"51"              | 09H<br>"51"            |
| 13  | FLASH WRITE ERR.                        | An error has occurred in writing data into the flash memory.                                                     | 08H<br>"50"              | 08H<br>"50"            |

| No. | LCD Message of the Upper Line (English)           | Printer Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Detail Status            |                        |
|-----|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
|     |                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Auto Status Transmission | Status Request Command |
| 14  | <b>FLASH MEM FULL</b>                             | Saving failed because of insufficient space in the flash memory.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0EH<br>"54"              | 0EH<br>"54"            |
| 15  | <b>EEPROM ERROR</b>                               | A back-up EEPROM cannot be read/written properly.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                          |                        |
| 16  | <b>LOW BATTERY</b>                                | The battery voltage has dropped to 7.2V or less for B-EP2DL, or 14V or less for B-EP4DL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 0AH<br>"36"              | 0AH<br>"36"            |
| 17  | <b>AMBIENT TEMP ERR</b>                           | An ambient temperature has dropped to -20 °C or lower, or exceeded 60 °C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 07H<br>"18"              | 07H<br>"18"            |
| 18  | <b>BATT. TEMP ERROR</b>                           | The battery may be heated and hurt operators. Please be careful not to get burned.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 07H<br>"18"              | 07H<br>"18"            |
| 19  | <b>HIGH VOLT. ERROR</b>                           | The battery may be heated and hurt operators.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 07H<br>"18"              | 07H<br>"18"            |
| 20  | <b>SYSTEM ERROR --</b>                            | System error<br>(a) A command has been fetched from an odd address.<br>(b) Word data has been accessed from a place other than the boundary of the word data.<br>(c) Long word data has been accessed from a place other than the boundary of the long word data.<br>(d) The logical area ranging from 80000000H to FFFFFFFFH has been accessed in user mode.<br>(e) An undefined command in a place other than the delay slot has been decoded.<br>(f) An undefined command in the delay slot has been decoded.<br>(g) A command which rewrites the data in the delay slot has been decoded. |                          |                        |
| 21  | <b>WAITING (BATT.)</b>                            | The battery protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          | 0BH<br>"02"            |
| 22  | <b>WAITING (HEAD)</b>                             | The print head protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          | 0BH<br>"02"            |
| 23  | <b>WAITING (MOTOR)</b>                            | The motor protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          | 0BH<br>"02"            |
| 24  | <b>BT INIT ERROR</b>                              | The initialization of Bluetooth failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          | 39H<br>"39"            |
| 25  | <b>BT SETTING ERROR</b>                           | There is an error in the Bluetooth setting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                          | 39H<br>"39"            |
| 26  | <b>CHARGE ERROR \$</b>                            | An error occurred while the battery was recharged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 37H<br>"37"              | 37H<br>"37"            |
| 27  | <b>Ir PACKET ERROR</b>                            | A block number error occurred in the TEC protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 02H<br>"06"              | 02H<br>"06"            |
| 28  | Display of error command<br>(See <b>NOTE 1.</b> ) | A command error has been found in analyzing the command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 02H<br>"06"              | 02H<br>"06"            |



| No. | LCD Message of the Upper Line (English) | Printer Status                                                                                         | Detail Status            |                        |
|-----|-----------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------|------------------------|
|     |                                         |                                                                                                        | Auto Status Transmission | Status Request Command |
| 29  | <b>BT Initializing</b>                  | BD address and bonding information are being registered.                                               |                          |                        |
| 30  | <b>SSP AUTH FAILED</b> *2               | Bluetooth pairing failed. (This message is displayed when SSP authentication is rejected by the host.) |                          | 00H                    |
|     |                                         |                                                                                                        |                          | "00"                   |

\*1 LABEL mode only (when connected through the RS-232C, IrCOMM or Bluetooth interface)

\*2 No. 30: "SSP AUTH FAILED" is displayed only when the printer model is B-EP-GH32 and SSP authentication type is set to "Display Only" or "Display Yes/No" of Numeric Comparison.

## 11.12 LCD MESSAGES AND LED INDICATIONS

The model and the firmware version are displayed on the character-oriented LCD.

| No. | LCD Messages of Upper line (English) | LED Indication | Printer Status                                                                                                  | Restoration by the [PAUSE] key Yes/No | Acceptance of Status Request and Reset Commands Yes/No |
|-----|--------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------|
|     |                                      | STATUS         |                                                                                                                 |                                       |                                                        |
| 1   | ON LINE                              | ○              | In the online mode                                                                                              | -                                     | Yes                                                    |
|     | ON LINE                              | ○              | In the online mode (Communicating)                                                                              | -                                     | Yes                                                    |
|     | LBL PRESENT ****                     | ⊙              | A label is waiting to be stripped.                                                                              | -                                     | Yes                                                    |
| 2   | COVER OPEN                           | ○              | The front cover was opened in the online mode.                                                                  | -                                     | Yes                                                    |
| 3   | PAUSE ****                           | ●              | In a pause state                                                                                                | Yes                                   | Yes                                                    |
| 4   | COMMS ERROR                          | ◇              | A parity error, overrun error or framing error has occurred during communication through the RS-232C interface. | Yes                                   | Yes                                                    |
| 5   | PAPER JAM ****                       | ◇              | A paper jam has occurred during paper feed.                                                                     | Yes                                   | Yes                                                    |
| 6   | NO PAPER ****                        | ◇              | The paper has run out.                                                                                          | Yes                                   | Yes                                                    |
| 7   | NO PAPER                             | ◇              | A label has been completed normally, and then the paper has run out.                                            | Yes                                   | Yes                                                    |
| 8   | COVER OPEN                           | ◇              | A feed or an issue was attempted with the print head opened (except the [PAUSE] key).                           | Yes                                   | Yes                                                    |
| 9   | HEAD ERROR                           | ◇              | A broken element has been found on the thermal head.                                                            | Yes                                   | Yes                                                    |
| 10  | EXCESS HEAD TEMP                     | ◇              | The print head temperature has exceeded 71 °C.                                                                  | No                                    | Yes                                                    |
| 11  | SAVING ##### &&&&                    | ○              | In writable character or PC command save mode                                                                   | -                                     | Yes                                                    |
| 12  | FORMAT ERROR                         | ◇              | An erase error has occurred in formatting the flash ROM on the CPU board.                                       | No                                    | Yes                                                    |
| 13  | FLASH WRITE ERR.                     | ◇              | An error has occurred in writing data into the flash memory.                                                    | No                                    | Yes                                                    |
| 14  | FLASH MEM FULL                       | ◇              | Saving failed because of insufficient space in the flash memory.                                                | No                                    | Yes                                                    |
| 15  | EEPROM ERROR                         | ◇              | A back-up EEPROM cannot be read/written properly.                                                               | No                                    | No                                                     |
| 16  | LOW BATTERY                          | □              | The battery voltage has dropped to 7.2V or less for B-EP2DL, or 14V or less for B-EP4DL.                        | No                                    | Yes                                                    |
| 17  | AMBIENT TEMP ERR                     | ◇              | An ambient temperature has dropped to -20 °C or lower, or exceeded 60 °C.                                       | Yes                                   | Yes                                                    |
| 18  | BATT. TEMP ERROR                     | ◇              | The battery may be heated and hurt operators.<br>Please be careful not to get burned.                           | No                                    | Yes                                                    |
| 19  | HIGH VOLT. ERROR                     | ◇              | The battery may be heated and hurt operators.                                                                   | No                                    | Yes                                                    |

| No. | LCD Messages of Upper line (English)              | LED Indication | Printer Status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Restoration by the [PAUSE] key Yes/No | Acceptance of Status Request and Reset Commands Yes/No |
|-----|---------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--------------------------------------------------------|
|     |                                                   | STATUS         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                       |                                                        |
| 20  | <b>SYSTEM ERROR --</b>                            | ◇              | System error<br>(a) A command has been fetched from an odd address.<br>(b) Word data has been accessed from a place other than the boundary of the word data.<br>(c) Long word data has been accessed from a place other than the boundary of the long word data.<br>(d) The logical area ranging from 8000000H to FFFFFFFFH has been accessed in user mode.<br>(e) An undefined command in a place other than the delay slot has been decoded.<br>(f) An undefined command in the delay slot has been decoded.<br>(g) A command which rewrites the data in the delay slot has been decoded. | No                                    | No                                                     |
| 21  | <b>WAITING (BATT.)</b>                            | ○              | The battery protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -                                     | Yes                                                    |
| 22  | <b>WAITING (HEAD)</b>                             | ○              | The print head protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | -                                     | Yes                                                    |
| 23  | <b>WAITING (MOTOR)</b>                            | ○              | The motor protection function is active.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -                                     | Yes                                                    |
| 24  | <b>BT INIT ERROR</b>                              | ○              | The initialization of Bluetooth failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | No                                    | Yes                                                    |
| 25  | <b>BT SETTING ERROR</b>                           | ○              | There is an error in the Bluetooth setting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No                                    | Yes                                                    |
| 26  | <b>CHARGE ERROR \$</b>                            | ◇              | An error occurred while the battery was recharged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | No                                    | Yes                                                    |
| 27  | <b>Ir PACKET ERROR</b>                            | ◇              | A block number error occurred in the TEC protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Yes                                   | Yes                                                    |
| 28  | Display of error command<br>(See <b>NOTE 1.</b> ) | ◇              | A command error has been found in analyzing the command.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Yes                                   | Yes                                                    |
| 29  | <b>BT Initializing</b>                            | ○              | BD address and bonding information are being registered.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | No                                    | No                                                     |
| 30  | <b>SSP AUTH FAILED</b>                            | ○              | Bluetooth pairing failed. (This message is displayed when SSP authentication is rejected by the host.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Yes                                   | Yes                                                    |

\* When the compatible mode for the B-SP series is enabled, No.11 SAVING ##### &&&& displays "ON LINE."

\* No. 30: "SSP AUTH FAILED" is displayed only when the printer model is B-EP-GH32 and SSP authentication type is set to "Display Only" or "Display Yes/No" of Numeric Comparison.

**NOTE 1:** When a command error has been found in the sent command, 16-byte command code of the erroneous command is displayed on the LCD. (However, [LF] and [NUL] are not displayed.)

[Example 1] [ESC] PC001; 0A00, 0300, 2, 2, A, 00, B [LF] [NUL]

Command error  
LCD display PC001;0A00,0300,

[Example 2] [ESC] T02A G30 [LF] [NUL]

Command error  
LCD display T20A30

[Example 3] [ESC] XR; 0200, 0300, 0450, 1200, 1 [LF] [NUL]

Command error  
LCD display XR;0200,0300,045

**NOTE 2:** When the command error is displayed, “? (3FH)” is displayed for codes other than 20H to 7FH and A0H to DFH.

- NOTE 3:**
- ◇: Blinking (red)
  - : ON (red)
  - : ON (green or orange)
  - ⊙: Blinking (green)
  - : Dimmed
  - \*\*\*\*: Remaining number of labels to be printed 0001 to 9999 (in units of 1 label/tag)
  - #####: Remaining memory capacity of PC save area in the flash memory:  
0 to 3,200 (in K bytes)
  - &&&&: Remaining memory capacity of writable character / basic files / forms / graphics storage area  
in the flash memory  
0 to 3,200 (in K bytes)
  - : System error No.: 00 to 21
  - \$: Charging error No.: 1 to 5

### 11.13 LIST OF CHARGING ERROR NO. AND DETAILS

| No. | Description                                | Cause                                                                                    |
|-----|--------------------------------------------|------------------------------------------------------------------------------------------|
| 1   | Battery ID error                           | It is detected that no battery is loaded or that an inappropriate battery is loaded.     |
| 2   | Abnormal battery temperature               | 8.7V or over for B-EP2DL<br>17.4 V or over for B-EP4DL                                   |
| 3   | Abnormal current (during trickle charging) | 1.2A or over for B-EP2DL<br>2.0A or over for B-EP4DL                                     |
| 4   | Trickle charging timeout                   | Transition to normal charging does not take place after trickle charging for 90 minutes. |
| 5   | Abnormal current (during normal charging)  | 1.2A or over for B-EP2DL<br>2.0A or over for B-EP4DL                                     |

## 11.14 LCD MESSAGES IN DIFFERENT LANGUAGES

| No. | ENGLISH           |
|-----|-------------------|
| 1   | ON LINE           |
| 2   | COVER OPEN        |
| 3   | PAUSE ****        |
| 4   | COMMS ERROR       |
| 5   | PAPER JAM ****    |
| 6   | NO PAPER ****     |
| 7   | NO PAPER          |
| 8   | COVER OPEN ****   |
| 9   | HEAD ERROR        |
| 10  | EXCESS HEAD TEMP  |
| 11  | SAVING ##### &&&& |
| 12  | FORMAT ERROR      |
| 13  | FLASH WRITE ERR.  |
| 14  | FLASH MEM FULL    |
| 15  | EEPROM ERROR      |
| 16  | LOW BATTERY       |
| 17  | AMBIENT TEMP ERR  |
| 18  | BATT. TEMP ERROR  |
| 19  | HIGH VOLT. ERROR  |
| 20  | SYSTEM ERROR --   |
| 21  | WAITING (BATT.)   |
| 22  | WAITING (HEAD)    |
| 23  | WAITING (MOTOR)   |
| 24  | BT INIT ERROR     |
| 25  | BT SETTING ERROR  |
| 26  | CHARGE ERROR \$   |
| 27  | Ir PACKET ERROR   |
| 28  | LBL PRESENT ****  |
| 29  | BT Initializing   |
| 30  | SSP AUTH FAILED   |

| No. | GERMAN            |
|-----|-------------------|
| 1   | ON LINE           |
| 2   | DECKEL OFFEN      |
| 3   | PAUSE ****        |
| 4   | UEBERTR.-FEHLER   |
| 5   | PAPIERSTAU ****   |
| 6   | PAPIERENDE ****   |
| 7   | PAPIERENDE        |
| 8   | DECKEL OFFEN****  |
| 9   | KOPF DEFEKT       |
| 10  | KOPF UEBERHITZT   |
| 11  | SP.-MOD##### &&&& |
| 12  | FORMATFEHLER      |
| 13  | FLASH FEHLER      |
| 14  | FLASH ZU KLEIN    |
| 15  | EEPROM FEHLER     |
| 16  | BATTERY SCHWACH   |
| 17  | TEMP. FEHLER      |
| 18  | BATT.TEMP.FEHLER  |
| 19  | HIGH VOLT.FEHLER  |
| 20  | SYSTEM FEHLER --  |
| 21  | WAITING (BATT.)   |
| 22  | WAITING (HEAD)    |
| 23  | WAITING (MOTOR)   |
| 24  | BT INIT ERROR     |
| 25  | BT SETTING ERROR  |
| 26  | BATT.LADEFEHLER\$ |
| 27  | Ir PACKET ERROR   |
| 28  | LBL ABNEHMEN****  |
| 29  | BT Initializing   |
| 30  | SSP AUTH FAILED   |

| No. | FRENCH            |
|-----|-------------------|
| 1   | PRETE             |
| 2   | ERR. CAPOT        |
| 3   | PAUSE ****        |
| 4   | ERR. COMMUNICAT.  |
| 5   | PB. PAPIER ****   |
| 6   | FIN PAPIER ****   |
| 7   | FIN PAPIER        |
| 8   | ERR. CAPOT ****   |
| 9   | ERREUR TETE       |
| 10  | TETE TROP CHAUDE  |
| 11  | MEM LIB##### &&&& |
| 12  | ERREUR DE FORMAT  |
| 13  | ERREUR MEM FLASH  |
| 14  | MEM INSUFFISANTE  |
| 15  | ERREUR EEPROM     |
| 16  | BATTERIE FAIBLE   |
| 17  | ERR.TEMP.EXTER.   |
| 18  | ERR.TEMP.BATT.    |
| 19  | HIGH VOLT. ERROR  |
| 20  | ERR. SYSTEME --   |
| 21  | ATTENTE (BATT.)   |
| 22  | ATTENTE (TETE)    |
| 23  | ATTENTE (MOT.)    |
| 24  | ERR. INIT BT      |
| 25  | ERR. CONF BT      |
| 26  | ERREUR CHARGE \$  |
| 27  | Ir PACKET ERROR   |
| 28  | MEDIA DISPO ****  |
| 29  | BT Initializing   |
| 30  | SSP AUTH FAILED   |

| No. | DUTCH            |
|-----|------------------|
| 1   | IN LIJN          |
| 2   | DEKSEL OPEN      |
| 3   | PAUZE ****       |
| 4   | COMM. FOUT       |
| 5   | PAPIER VAST **** |
| 6   | PAPIER OP ****   |
| 7   | PAPIER OP        |
| 8   | DEKSEL OPEN **** |
| 9   | PRINTKOP DEFECT  |
| 10  | TEMP. FOUT       |
| 11  | MEM ##### &&&&   |
| 12  | FORMAAT FOUT     |
| 13  | FLASH MEM FOUT   |
| 14  | GEHEUGEN VOL     |
| 15  | EEPROM ERROR     |
| 16  | LAGE BATTERIJ    |
| 17  | OMGEVNG TMP FOUT |
| 18  | FOUT BATT. TEMP  |
| 19  | HIGH VOLT. ERROR |
| 20  | SYSTEEM FOUT --  |
| 21  | Wachten (BATT.)  |
| 22  | Wachten (HEAD)   |
| 23  | Wachten (MOTOR)  |
| 24  | BT INIT ERROR    |
| 25  | BT SETTING ERROR |
| 26  | OPLAADFOUT \$    |
| 27  | Ir PACKET ERROR  |
| 28  | ETIKET KLAAR**** |
| 29  | BT Initializing  |
| 30  | SSP AUTH FAILED  |

| No. | SPANISH           |
|-----|-------------------|
| 1   | ON LINE           |
| 2   | TAPA ABIERTA      |
| 3   | PAUSA ****        |
| 4   | ERROR COMUNICACI  |
| 5   | ATASCO PAPEL****  |
| 6   | SIN PAPEL ****    |
| 7   | SIN PAPEL         |
| 8   | TAPA ABIERTA****  |
| 9   | ERROR DE CABEZAL  |
| 10  | TEMP.CABEZA ALTA  |
| 11  | SALVAR ##### &&&& |
| 12  | ERROR DE FORMATO  |
| 13  | ERROR ESCRITURA   |
| 14  | MEMORIA INSUFICI  |
| 15  | EEPROM ERROR      |
| 16  | BATERIA BAJA      |
| 17  | TEMP.AMBIEN.ALTA  |
| 18  | ERR.TEMP.BATERIA  |
| 19  | ERR.VOLT.BATERIA  |
| 20  | ERR DE SISTEMA--  |
| 21  | ESPERA: BATERIA   |
| 22  | ESPERA: CABEZAL   |
| 23  | ESPERA: MOTOR     |
| 24  | ERR.INICIALIZ.BT  |
| 25  | ERROR CONFIG. BT  |
| 26  | ERROR DE CARGA \$ |
| 27  | Ir PACKET ERROR   |
| 28  | ETQT PRESENT****  |
| 29  | BT Initializing   |
| 30  | SSP AUTH FAILED   |

| No. | ITALIAN          |
|-----|------------------|
| 1   | PRONTA           |
| 2   | TESTA APERTA     |
| 3   | PAUSA ****       |
| 4   | ERR. COMUNICAZ.  |
| 5   | CARTA INCEP.**** |
| 6   | NO CARTA ****    |
| 7   | NO CARTA         |
| 8   | APERTA TESTA**** |
| 9   | ERRORE TESTINA   |
| 10  | TEMP TESTA ALTA  |
| 11  | SALVA ##### &&&& |
| 12  | ERR. FORMATTAZ   |
| 13  | ERR.SCRITT.CARD  |
| 14  | MEM. CARD PIENA  |
| 15  | EEPROM ERROR     |
| 16  | LOW BATTERY      |
| 17  | AMBIENT TEMP ERR |
| 18  | BATT. TEMP ERROR |
| 19  | ERRORE VOLT BATT |
| 20  | ERR. SISTEMA --  |
| 21  | ATTESA (BATT.)   |
| 22  | ATT. TESTA CALDA |
| 23  | ATT.MOTORE CALDO |
| 24  | ERR. INIZ. B.T.  |
| 25  | ERR.CONFIG. B.T. |
| 26  | ERR.CARICANTO \$ |
| 27  | Ir PACKET ERROR  |
| 28  | ETICH.PRONTA**** |
| 29  | BT Initializing  |
| 30  | SSP AUTH FAILED  |

| No. | JAPANESE |
|-----|----------|
| 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  |          |

\* The Japanese messages are omitted here.

## 11.15 RECOVERY OF BD ADDRESS

From the firmware V1.2, a function to recover the BD address has been supported because the BD address sometimes becomes indefinite. (The B-EP-GH32 does not support the recovery function.) When the BD address is indefinite, the host cannot communicate using the registered BD address and requires to obtain a new BD address by performing an inquiry scan. To prevent this symptom, a function to recover the BD address has been added. Specifically, the BD address is detected at a power on time, and if the detected address is indefinite, it is recovered to a normal value. When a recovery of BD address is executed, "SYSTEM ERROR 19" is displayed on the LCD to notify the completion of recovery. After this message is displayed, turning the printer off and back to on will enable normal operations of the printer.

However, the result of this function differs depending on the Bluetooth module version.

| Bluetooth module |                                          | Firmware      |                        | LCD message                                 |
|------------------|------------------------------------------|---------------|------------------------|---------------------------------------------|
| Version          | Self-restoration and BD address updating | Version       | Recovery of BD address |                                             |
| V244             | Not supported                            | V1.2 only     | Supported              | "SYSTEM ERROR 18"                           |
|                  |                                          | V1.3 or later | Not supported (*1)     | "ON LINE" (*3)                              |
| V257             | Supported                                | V1.2 or later | Supported              | "SYSTEM ERROR 18" or "SYSTEM ERROR 19" (*2) |

\*1: The firmware V1.3 or later supports the BD address recovery function, but does not support Bluetooth module V244.

\*2: Which message is displayed depends on the result of a BD address recovery.

\*3: In the case of the B-EP4DL-GH30-FE-QM-R (FedEx model), "SYSTEM ERROR 18" or "SYSTEM ERROR 19" is displayed.

Notes:

1. When "SYSTEM ERROR 18" is displayed, the printer cannot be restored by turning off and back to on. Service call is required.
2. In the case the Bluetooth module is replaced, the printer will assign the backed up BD address to the new module. This means the printer duplicates the former Bluetooth module. Accordingly, the Bluetooth module shall not be replaced basically.



### 11.15.1 RECOVERY OF BONDING TABLE

This function, which backs up the bonding table (BD address and PIN code) information, is supported from firmware version V1.3. (The B-EP-GH32 does not support the recovery function.)

If the registered bonding table information cannot be obtained, the printer recovers the information based on the backed up information.

Before firmware version V1.3, there were cases that the printer cannot re-connect to a host if this problem occurs. To recover from this situation, it was required to register the bonding table again with the setting tool. This process has been automated from V1.3.

When this function is activated, the printer will behave as follows.

When the printer power is turned on, a message, "BT Initializing", is displayed on the LCD and a recovery of the bonding table information is performed. After the recovery is successfully completed, "SYSTEM ERROR 19" is displayed on the LCD. After the printer is turned off and back to on, the printer starts up in the online mode and enables normal operations.

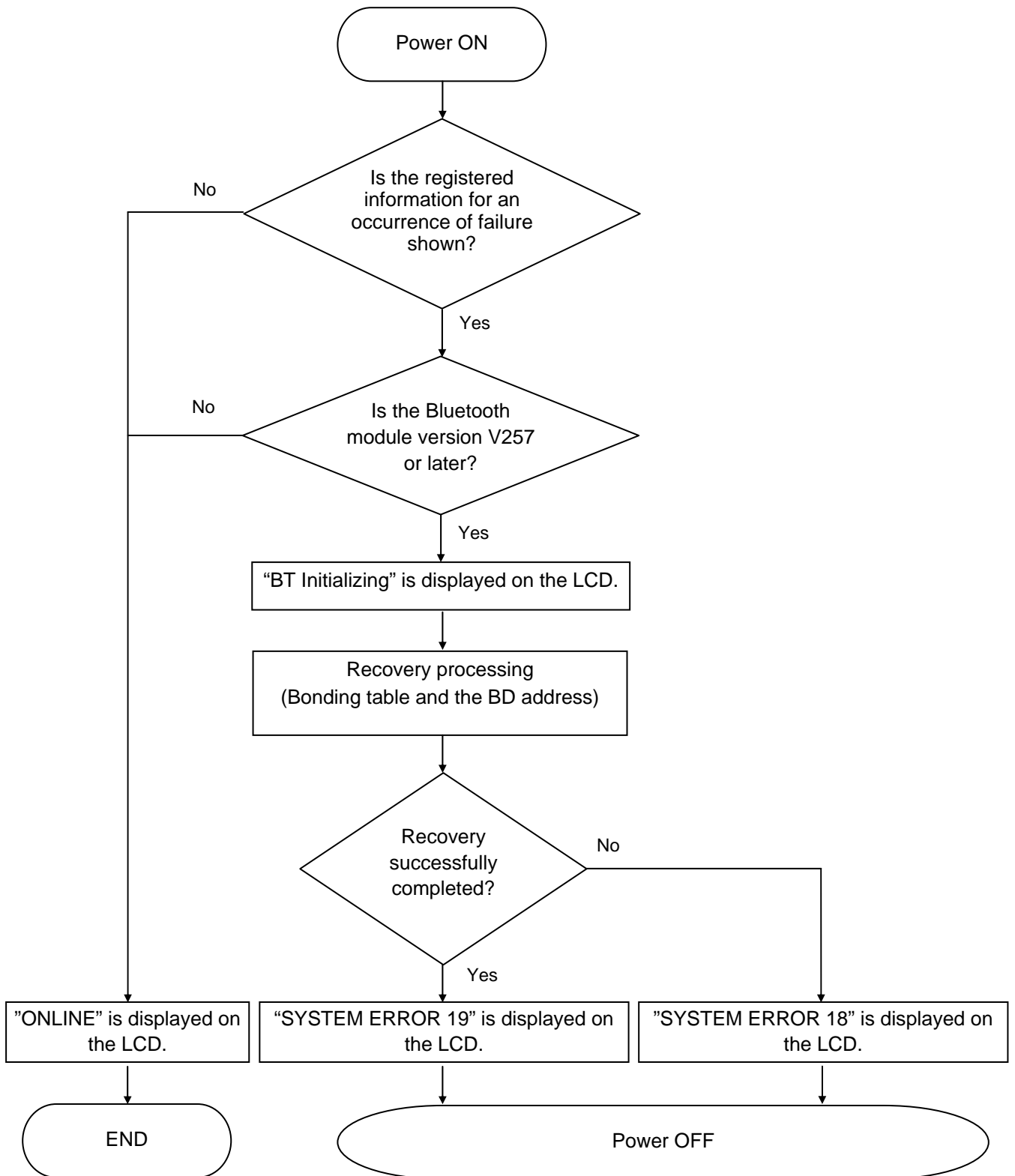
Even when there is not the bonding table information, a recovery is performed, and the printer becomes connectable to the host.

When the security level for the Bluetooth has been set to link level, an entry of PIN code is requested by the host. For details, refer to the flowchart.

\* A recovery processing takes 30 seconds at the maximum. During a recovery, "BT Initializing" is displayed on the LCD.

\* While "BT Initializing" is displayed, the battery shall not be removed and the printer power shall not be turned off. Doing so causes the recovery data to be indefinite.

Flow chart for recovery processing



## 12. CHARACTER CODE TABLE

### 12.1 GENERAL DESCRIPTION

This chapter provides the character code tables.

### 12.2 CHARACTER CODE

The printable characters are slightly different according to the character type, because the fonts, which have been installed on the printer, are not described in the table.

#### 12.2.1 UTF-8 CHARACTER CODE

Characters to be printed are shown below when UTF-8 is selected as a character code and its code is entered.

- \* In the following code list, the high bytes are plotted along the vertical coordinate while the low bytes are plotted along the horizontal coordinate.

The number of digits for the horizontal coordinate is fixed to 1 digit. Therefore, when the number of digits for the vertical coordinate is 1, the character is a 1-byte character (2-digit hexadecimal). In the same way, when the vertical coordinate is 3 or 5 digits, the character is a 2-byte character (4-digit hexadecimal) or 3-byte character (6-digit hexadecimal), respectively.

e.g. In the following list, the character for 0xE282A1 represents “A” based on E282A of the vertical coordinate and 1 of the horizontal coordinate.

|       | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8   | 9 | A | B | C | D | E | F |
|-------|---|---|---|---|----|---|---|---|-----|---|---|---|---|---|---|---|
| E2809 |   | ! | “ | # | \$ | % | & | ' | ( ) | * | + | , | - | . | / |   |
| E281B | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8   | 9 | : | ; | < | = | > | ? |
| E282A | @ | A | B | C | D  | E | F | G | H   | I | J | K | L | M | N | O |
| E2889 | P | Q | R | S | T  | U | V | W | X   | Y | Z | [ | \ | ] | ^ | _ |

**12.3 TIMES ROMAN, HELVETICA, LETTER GOTHIC, PRESTIGE ELITE, COURIER, GOTHIC725 Black** (Bit map font type: A, B, C, D, E, F, G, H, I, J, K, L, N, O, P, Q, R, o, q)

(1) PC-850

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç | É | á | € |   | ø | 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 | Õ | ú |   |   | Ë | Ò | ¾ |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | Ö | ñ |   |   | È | ö | ¶ |
| 5 |   |   | %  | 5 | E | U | e | u | à | Ò | Ñ | Á |   | · | Ö | § |
| 6 |   |   | &  | 6 | F | V | f | v | â | Û | · | Â | ã | í | μ | ÷ |
| 7 |   |   | '  | 7 | G | W | g | w | ç | ù | · | 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 |   |   | Ü | ¹ |   |
| C |   |   | ,  | < | L | \ | l |   | î | £ | ¼ |   |   | Ý | ³ |   |
| D |   |   | -  | = | M | ] | m | } | ì | Ø | ¡ | ¢ |   | ÿ | ² |   |
| E |   |   | .  | > | N | ^ | n | ~ | Ä | × | « | ¥ |   | ì | ¯ | ■ |
| F |   |   | /  | ? | O | _ | o | ¸ | Å | f | » |   | α |   | ´ |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2) PC-8

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9  | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|----|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç | É  | á | € |   |   | α | ≡ |
| 1 |   |   | !  | 1 | A | Q | a | q | ü | æ  | í |   |   |   | β | ± |
| 2 |   |   | "  | 2 | B | R | b | r | é | Æ  | ó |   |   |   | Γ | ≥ |
| 3 |   |   | #  | 3 | C | S | c | s | â | ô  | ú |   |   |   | π | ≤ |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | ö  | ñ |   |   |   | Σ | ∫ |
| 5 |   |   | %  | 5 | E | U | e | u | à | ò  | Ñ |   |   |   | σ | ∫ |
| 6 |   |   | &  | 6 | F | V | f | v | â | û  | · |   |   |   | μ | ÷ |
| 7 |   |   | '  | 7 | G | W | g | w | ç | ù  | · |   |   |   | τ | ≈ |
| 8 |   |   | (  | 8 | H | X | h | x | ê | ÿ  | ¿ |   |   |   | Φ | ° |
| 9 |   |   | )  | 9 | I | Y | i | y | ë | Ö  | · |   |   |   | Θ | • |
| A |   |   | *  | : | J | Z | j | z | è | Ü  | ¬ |   |   |   | Ω | • |
| B |   |   | +  | ; | K | [ | k | { | ï | ¢  | ½ |   |   |   | δ | √ |
| C |   |   | ,  | < | L | \ | l |   | î | £  | ¼ |   |   |   | ∞ | n |
| D |   |   | -  | = | M | ] | m | } | ì | ¥  | ¡ |   |   |   | ∅ | ₂ |
| E |   |   | .  | > | N | ^ | n | ~ | Ä | Pt | « |   |   |   | ε | ■ |
| F |   |   | /  | ? | O | _ | o | ¸ | Å | f  | » |   |   |   | ∩ |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(3) PC-852

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç | É | á | € |   |   | Ó | - |
| 1 |   |   | !  | 1 | A | Q | a | q | ü |   | í |   |   | Đ | ß |   |
| 2 |   |   | "  | 2 | B | R | b | r | é |   | ó |   |   |   | Ô |   |
| 3 |   |   | #  | 3 | C | S | c | s | â | ô | ú |   |   | È |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | ö |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   | Á |   |   |   | § |
| 6 |   |   | &  | 6 | F | V | f | v |   |   |   | Â |   | Í |   | ÷ |
| 7 |   |   | '  | 7 | G | W | g | w | ç |   |   |   |   | Î |   | ˆ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   |   |   |   |   |   | ˚ |
| 9 |   |   | )  | 9 | I | Y | i | y | ë | Ö |   |   |   |   | Ú | ¨ |
| A |   |   | *  | : | J | Z | j | z |   | Ü | ¬ |   |   |   |   | • |
| B |   |   | +  | ; | K | [ | k | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   | î |   |   |   |   |   | ý |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   | ÿ |   |
| E |   |   | .  | > | N | ^ | n | ~ | Ä | × | « |   |   |   |   | ■ |
| F |   |   | /  | ? | O | _ | o | ⌘ |   |   | » |   | α |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(4) PC-857

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç | É | á | € |   | ^ | Ó | - |
| 1 |   |   | !  | 1 | A | Q | a | q | ü | æ | í |   |   | ¬ | 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 |   |   | Ö | § |
| 6 |   |   | &  | 6 | F | V | f | v | â | û |   | Â | ã | Í | μ | ÷ |
| 7 |   |   | '  | 7 | G | W | g | w | ç | ù |   | À | Ã | Î |   | ˆ |
| 8 |   |   | (  | 8 | H | X | h | x | ê |   | ¿ | © |   | 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 |   |   |   | ì | ³ |
| D |   |   | -  | = | M | ] | m | } |   | Ø | ¡ | ¢ |   | ı | ÿ | ² |
| E |   |   | .  | > | N | ^ | n | ~ | Ä |   | « | ¥ |   | ì | ˘ | ■ |
| F |   |   | /  | ? | O | _ | o | ⌘ | Å |   | » |   | α |   | ' |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(5) PC-851

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q | ü |   |   |   |   |   |   | ± |
| 2 |   |   | "  | 2 | B | R | b | r | é |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s | â | ô |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | ö |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u | à |   |   |   |   |   |   | § |
| 6 |   |   | &  | 6 | F | V | f | v |   | û |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | g | w | ç | ù |   |   |   |   |   | • |
| 8 |   |   | (  | 8 | H | X | h | x | ê |   |   |   |   |   |   | ° |
| 9 |   |   | )  | 9 | I | Y | i | y | ë | Ö |   |   |   |   |   | ¨ |
| A |   |   | *  | : | J | Z | j | z | è | Ü |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { | ï |   | ½ |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   | î | £ |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ | Ä |   | « |   |   |   |   | ■ |
| F |   |   | /  | ? | O | _ | o | ☒ |   |   | » |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(6) PC-855

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

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(7) PC-1250

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | ± | Á |   | á |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   |   |   | Â |   | â |   |
| 3 |   |   | #  | 3 | C | S | c | s |   |   |   |   |   | Ó |   | ó |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ | ' | Ä | Ô | ä | ô |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   | μ |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | f | v |   |   | ¡ | ¶ |   | Ö |   | ö |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | · | Ç | × | ç | ÷ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   | ¨ | , |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   | © |   | É |   | é |   |
| A |   |   | *  | : | J | Z | j | z |   |   |   |   |   | Ú |   | ú |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » | Ë |   | ë |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ |   |   | Ü |   | ü |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   | Í | Ý | í | ý |
| E |   |   | .  | > | N | ^ | n | ~ |   |   | ® |   | Î |   | î |   |
| F |   |   | /  | ? | O | _ | o | ⌘ |   |   |   |   |   | ß |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(8) PC-1251

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | ± |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   | μ |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | f | v |   |   | ¡ | ¶ |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | · |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | h | x |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   | © |   |   |   |   |   |
| A |   |   | *  | : | J | Z | j | z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ |   |   |   |   |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   | ® |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | o | ⌘ |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(9) PC-1252

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

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(10) PC-1253

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | ± |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   |   | ² |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s | f |   | £ | ³ |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   | ¥ | µ |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | f | v |   |   | ı | ¶ |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | · |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | h | x |   |   | ¨ |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   | © |   |   |   |   |   |
| A |   |   | *  | : | J | Z | j | z |   |   | ¬ |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ |   |   |   |   |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   | ½ |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   | ® |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | o | ⌘ |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.



(11) PC-1254

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

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(12) PC-1257

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B            | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|--------------|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | €            |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | ±            |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   | ¢ | <sup>2</sup> |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s |   |   | £ | <sup>3</sup> |   | Ó |   | ó |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ | '            | Ä |   | ä |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   | μ            | Å | Õ | å | õ |
| 6 |   |   | &  | 6 | F | V | f | v |   |   | ı | ¶            |   | Ö |   | ö |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | ·            |   | × |   | ÷ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   | Ø | ø            |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   | © | <sup>1</sup> | É |   | é |   |
| A |   |   | *  | : | J | Z | j | z |   |   |   |              |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | »            |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ | ¼            |   | Ü |   | ü |
| D |   |   | -  | = | M | ] | m | } | ¨ | - |   | ½            |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   | ® | ¾            |   |   |   |   |
| F |   |   | /  | ? | O | _ | o | ⌘ |   |   | Æ | æ            |   | ß |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(13) LATIN9

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

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(14) Arabic

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

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(15) UTF-8

(15.1) Bit map font type: A, B, D, F, K, O, Q or R

\* For the font type O, ¡, ©, ¬, ®, º, ¸, µ, ¶, ¯, ¼, Pt and ¯ are not printed.

|     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-----|---|---|---|---|----|---|---|---|---|---|---------|---------|---------|---------|---------|---------|
| 0   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 1   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 2   |   | ! | " | # | \$ | % | & | ' | ( | ) | *       | +       | ,       | -       | .       | /       |
| 3   | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :       | ;       | <       | =       | >       | ?       |
| 4   | @ | A | B | C | D  | E | F | G | H | I | J       | K       | L       | M       | N       | O       |
| 5   | P | Q | R | S | T  | U | V | W | X | Y | Z       | [       | \       | ]       | ^       | _       |
| 6   | ' | a | b | c | d  | e | f | g | h | i | j       | k       | l       | m       | n       | o       |
| 7   | p | q | r | s | t  | u | v | w | x | y | z       | {       |         | }       | ~       | ☒       |
| C28 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C29 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C2A |   | ¡ | ¢ | £ | ¤  | ¥ | ¦ | § | ¨ | © | ª       | «       | ¬       | -       | ®       | ¯       |
| C2B | ° | ± | ² | ³ | ´  | µ | ¶ | · | ¸ | ¹ | º       | »       | ¼       | ½       | ¾       | ¿       |
| C38 | À | Á | Â | Ã | Ä  | Å | Æ | Ç | È | É | Ê       | Ë       | Ì       | Í       | Î       | Ï       |
| C39 | Ð | Ñ | Ò | Ó | Ô  | Õ | Ö | × | Ø | Ù | Ú       | Û       | Ü       | Ý       | Þ       | ß       |
| C3A | à | á | â | ã | ä  | å | æ | ç | è | é | ê       | ë       | ì       | í       | î       | ï       |
| C3B | ð | ñ | ò | ó | ô  | õ | ö | ÷ | ø | ù | ú       | û       | ü       | ý       | þ       | ÿ       |
| C48 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C49 | Ð |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C4A |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C4B |   | ¡ |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C68 |   |   |   |   |    |   |   |   |   | Ð |         |         |         |         |         |         |
| C69 |   |   | f |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C6A |   |   |   |   |    |   |   |   |   | Σ |         |         |         |         |         |         |
| C6B |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C98 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C99 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C9A |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C9B |   |   |   |   |    |   |   |   | φ |   |         |         |         |         |         |         |
| CA8 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| CA9 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| CAA |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| CAB |   |   |   |   |    |   |   |   |   | , |         |         |         |         |         |         |

|       | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7  | 8  | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-------|---|---|---|---|---|---|---|----|----|---|---------|---------|---------|---------|---------|---------|
| CB8   |   |   |   |   |   |   | ^ |    |    |   | '       |         |         |         |         |         |
| CB9   |   |   |   |   |   |   |   |    |    | . | °       | ,       | ~       |         |         |         |
| CBA   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CBB   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CC8   |   | , |   | ~ | - | - |   | .  | .. |   | °       |         |         |         |         |         |
| CC9   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CCA   |   |   |   |   |   |   |   | ,  |    |   |         |         |         |         |         |         |
| CCB   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CE8   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CE9   |   |   |   | Γ |   |   |   |    | Θ  |   |         |         |         |         |         |         |
| CEA   |   |   |   | Σ |   |   | Φ |    |    | Ω |         |         |         |         |         |         |
| CEB   |   | α | β |   | δ | ε |   |    |    |   |         |         | μ       |         |         |         |
| CF8   | π |   |   | σ | τ |   | φ |    |    |   |         |         |         |         |         |         |
| CF9   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CFA   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| CFB   |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| E2809 |   |   |   |   |   |   |   | =  |    |   |         |         |         |         |         |         |
| E281B |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         | η       |
| E282A |   |   |   |   |   |   |   | Pt |    |   |         |         | €       |         |         |         |
| E2889 |   |   |   |   |   |   |   |    |    | • | √       |         |         |         | ∞       |         |
| E288A |   |   |   |   |   |   |   |    |    | ∩ |         |         |         |         |         |         |
| E2898 |   |   |   |   |   |   |   |    | ≈  |   |         |         |         |         |         |         |
| E289A |   | ≡ |   |   | ≤ | ≥ |   |    |    |   |         |         |         |         |         |         |
| E28C9 | ┌ |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| E28CA | ┐ | J |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| E296A | ■ |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |
| E5808 |   |   |   |   |   |   |   |    |    |   |         |         |         |         |         |         |

(15.2) Bit map font type: C, E, G, H, I, J, L, N, P, o or q

- \* For the font types G, N and P, ¡, ©, ¬, ®, <sup>2</sup>, <sup>3</sup>, μ, ¶, <sup>1</sup>, <sup>3</sup>/<sub>4</sub>, ÷, Σ and φ are not printed.
- \* For the font types H, I, J and L, Σ and φ are not be printed.
- \* For the font types o and q, ☒, Σ and φ are not be printed but 0xCEB2(β) is printed.

|     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10           | 11 | 12 | 13 | 14 | 15 |
|-----|---|---|---|---|----|---|---|---|---|---|--------------|----|----|----|----|----|
|     |   |   |   |   |    |   |   |   |   |   | A            | B  | C  | D  | E  | F  |
| 0   |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| 1   |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| 2   |   | ! | " | # | \$ | % | & | ' | ( | ) | *            | +  | ,  | -  | .  | /  |
| 3   | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :            | ;  | <  | =  | >  | ?  |
| 4   | @ | A | B | C | D  | E | F | G | H | I | J            | K  | L  | M  | N  | O  |
| 5   | P | Q | R | S | T  | U | V | W | X | Y | Z            | [  | \  | ]  | ^  | _  |
| 6   | ' | a | b | c | d  | e | f | g | h | i | j            | k  | l  | m  | n  | o  |
| 7   | p | q | r | s | t  | u | v | w | x | y | z            | {  |    | }  | ~  | ☒  |
| C28 |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C29 |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C2A |   | ı | ç | £ | ¤  | ¥ | ¦ | § | ¨ | © | <sup>a</sup> | «  | ¬  | -  | ®  | —  |
| C2B | ° | ± | ² | ³ | ´  | µ | ¶ | • | ¸ | ¹ | º            | »  | ¼  | ½  | ¾  | ¿  |
| C38 | À | Á | Â | Ã | Ä  | Å | Æ | Ç | È | É | Ê            | Ë  | Ì  | Í  | Î  | Ï  |
| C39 | Ð | Ñ | Ò | Ó | Ô  | Õ | Ö | × | Ø | Ù | Ú            | Û  | Ü  | Ý  | Þ  | ß  |
| C3A | à | á | â | ã | ä  | å | æ | ç | è | é | ê            | ë  | ì  | í  | î  | ï  |
| C3B | ð | ñ | ò | ó | ô  | õ | ö | ÷ | ø | ù | ú            | û  | ü  | ý  | þ  | ÿ  |
| C48 |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C49 | Ð |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C4A |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C4B |   | ı |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C68 |   |   |   |   |    |   |   |   |   | Ð |              |    |    |    |    |    |
| C69 |   |   | f |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C6A |   |   |   |   |    |   |   |   |   | Σ |              |    |    |    |    |    |
| C6B |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C98 |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C99 |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C9A |   |   |   |   |    |   |   |   |   |   |              |    |    |    |    |    |
| C9B |   |   |   |   |    |   |   |   | φ |   |              |    |    |    |    |    |

|       | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8  | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-------|---|---|---|---|---|---|---|---|----|---|---------|---------|---------|---------|---------|---------|
| CA8   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CA9   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CAA   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CAB   |   |   |   |   |   |   |   |   |    | ' |         |         |         |         |         |         |
| CB8   |   |   |   |   |   |   | ^ |   |    | ' |         |         |         |         |         |         |
| CB9   |   |   |   |   |   |   |   |   |    | . | °       |         | ~       |         |         |         |
| CBA   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CBB   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CC8   |   | ' |   | ~ | - | - |   | . | .. |   | °       |         |         |         |         |         |
| CC9   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CCA   |   |   |   |   |   |   |   | . |    |   |         |         |         |         |         |         |
| CCB   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CE8   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CE9   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CEA   |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| CEB   |   |   |   |   |   |   |   |   |    |   |         |         | μ       |         |         |         |
| E2809 |   |   |   |   |   |   |   | = |    |   |         |         |         |         |         |         |
| E281B |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| E282A |   |   |   |   |   |   |   |   |    |   |         |         | €       |         |         |         |
| E2889 |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| E28CA |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| E296A | ■ |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |
| E5808 |   |   |   |   |   |   |   |   |    |   |         |         |         |         |         |         |

## 12.4 PRESENTATION (Bit map font type: M)

### (1) PC-850, PC-857

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   | - |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   |   |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   | ¥ |   |   |   |   |
| F |   |   | /  | ? | O | _ | O | ⌘ |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

### (2) PC-8

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   |   |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   | ¥ |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | O | ⌘ |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSETM mode.

(3) PC-852

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   | - |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   |   |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | O |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   |   |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | O |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.



(5) PC-1252, PC-1254

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   | ¥ |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X | ^ | ~ |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | O |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(6) PC-1253

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   | - |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   | ¥ |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | O |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”  
The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(7) LATIN9

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | P |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | A | Q |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | B | R |   |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | C | S |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | D | T |   |   | € |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | E | U |   |   | ¥ |   |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | F | V |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | G | W |   |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | H | X |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | I | Y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | J | Z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | K | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | L |   |   |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | M | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | N | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | O | █ |   |   |   |   |   |   |   |   |

(8) UTF-8

|       | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|
|       |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |
| 0     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 1     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 2     |   | ! | " | # | \$ | % | & | ' | ( | ) | *  | +  | ,  | -  | .  | /  |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :  | ;  | <  | =  | >  | ?  |
| 4     | @ | A | B | C | D  | E | F | G | H | I | J  | K  | L  | M  | N  | O  |
| 5     | P | Q | R | S | T  | U | V | W | X | Y | Z  | [  | \  | ]  | ^  | _  |
| 6     | ' | a | b | c | d  | e | f | g | h | i | j  | k  | l  | m  | n  | o  |
| 7     | p | q | r | s | t  | u | v | w | x | y | z  | {  |    | }  | ~  | █  |
| C28   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C29   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C2A   |   |   | ¢ |   |    | ¥ |   |   |   |   |    |    |    | -  |    |    |
| C2B   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CB8   |   |   |   |   |    |   | ^ |   |   |   |    |    |    |    |    |    |
| CB9   |   |   |   |   |    |   |   |   |   |   |    |    | ~  |    |    |    |
| CBA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CBB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CC8   |   |   |   | ~ |    |   |   |   |   |   |    |    |    |    |    |    |
| CC9   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E2809 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E281B |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E282A |   |   |   |   |    |   |   |   |   |   |    |    | €  |    |    |    |
| E2889 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |

12.5 OCR-A (Bit map font type: S)

(1) PC-850, PC-857

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | ∏ |   |   |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   | ¥ |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(2) PC-8

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | ∏ |   |   |   |   |   |   |   |   |   |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   | ¥ |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(3) PC-852

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | П |   |   |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | П |   |   |   |   |   |   |   |   |   |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(5) PC-1252, PC-1254

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | ▯ |   |   |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   | ¥ |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   | ^ | ~ |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(6) PC-1253

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | ▯ |   |   |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   | ¥ |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(7) LATIN9

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P | π |   |   |   |   |   |   |   |   |   |
| 1 |   |   |    | 1 | A | Q |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   |   |   | ¥ |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(8) UTF-8

|     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-----|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|
|     |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |
| 0   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 1   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 2   |   |   | " |   | \$ |   |   |   |   |   |    | +  |    | -  | .  | /  |
| 3   | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 |    |    | <  |    | >  |    |
| 4   |   | A | B | C | D  | E | F | G | H | I | J  | K  | L  | M  | N  | O  |
| 5   | P | Q | R | S | T  | U | V | W | X | Y | Z  |    |    |    |    |    |
| 6   | π |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 7   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C28 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C29 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C2A |   |   |   |   |    | ¥ |   |   |   |   |    |    |    | -  |    |    |
| C2B |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |

## 12.6 OCR-B (Bit map font type: T)

### (1) PC-850, PC-857

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P |   |   | 0 |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 | A | Q |   |   | 1 |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   | 2 |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   | 3 |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   | 4 |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   | 5 |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   | 6 |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   | 7 |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   | 8 |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   | 9 |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   | ¥ |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

### (2) PC-8

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P |   |   | 0 |   |   |   |   |   |   |   |
| 1 |   |   |    | 1 | A | Q |   |   | 1 |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   | 2 |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   | 3 |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   | 4 |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   | 5 |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   | 6 |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   | 7 |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   | 8 |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   | 9 |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   | ¥ |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(3) PC-852

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |   |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P |   |   | 0 |   |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 | A | Q |   |   | 1 |   |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   | 2 |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   | 3 |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   | 4 |   |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   | 5 |   |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   | 6 |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   | 7 |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   | 8 |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   | 9 |   |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |   |

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |  |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 0 |   |   |    | 0 |   | P |   |   | 0 |   |   |   |   |   |   |   |  |
| 1 |   |   |    | 1 | A | Q |   |   | 1 |   |   |   |   |   |   |   |  |
| 2 |   |   | "  | 2 | B | R |   |   | 2 |   |   |   |   |   |   |   |  |
| 3 |   |   |    | 3 | C | S |   |   | 3 |   |   |   |   |   |   |   |  |
| 4 |   |   | \$ | 4 | D | T |   |   | 4 |   |   |   |   |   |   |   |  |
| 5 |   |   |    | 5 | E | U |   |   | 5 |   |   |   |   |   |   |   |  |
| 6 |   |   |    | 6 | F | V |   |   | 6 |   |   |   |   |   |   |   |  |
| 7 |   |   |    | 7 | G | W |   |   | 7 |   |   |   |   |   |   |   |  |
| 8 |   |   |    | 8 | H | X |   |   | 8 |   |   |   |   |   |   |   |  |
| 9 |   |   |    | 9 | I | Y |   |   | 9 |   |   |   |   |   |   |   |  |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |  |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |  |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |  |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |  |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |  |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |  |

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates “¥.”



(5) PC-1252, PC-1254, LATIN9

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P |   |   | 0 |   |   |   |   |   |   |   |
| 1 |   |   |    | 1 | A | Q |   |   | 1 |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   | 2 |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   | 3 |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   | 4 |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   | 5 |   | ¥ |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   | 6 |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   | 7 |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   | 8 | ~ |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   | 9 |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates "¥."

(6) PC-1253

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 |   | P |   |   | 0 |   |   |   |   |   |   |   |
| 1 |   |   |    | 1 | A | Q |   |   | 1 |   |   |   |   |   |   |   |
| 2 |   |   | "  | 2 | B | R |   |   | 2 |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 | C | S |   |   | 3 |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T |   |   | 4 |   |   |   |   |   |   |   |
| 5 |   |   |    | 5 | E | U |   |   | 5 |   | ¥ |   |   |   |   |   |
| 6 |   |   |    | 6 | F | V |   |   | 6 |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 | G | W |   |   | 7 |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 | H | X |   |   | 8 |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 | I | Y |   |   | 9 |   |   |   |   |   |   |   |
| A |   |   |    |   | J | Z |   |   |   |   |   |   |   |   |   |   |
| B |   |   | +  |   | K |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |    | < | L |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   | M |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   | /  |   | O |   |   |   |   |   |   |   |   |   |   |   |

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

When any Japanese message is selected in the SYSTEM mode, code 5CH indicates "¥."

(7) UTF-8

|     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-----|---|---|---|---|----|---|---|---|---|---|---------|---------|---------|---------|---------|---------|
| 0   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 1   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 2   |   |   | “ |   | \$ |   |   |   |   |   |         | +       |         | -       | .       | /       |
| 3   | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 |         |         | <       |         | >       |         |
| 4   |   | A | B | C | D  | E | F | G | H | I | J       | K       | L       | M       | N       | O       |
| 5   | P | Q | R | S | T  | U | V | W | X | Y | Z       |         |         |         |         |         |
| 6   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 7   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C28 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C29 |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C2A |   |   |   |   |    | ¥ |   |   |   |   |         |         |         | -       |         |         |
| C2B |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |

**12.7 STANDARD CHARACTER (in Japan)/KANJI (16 x 16) (in Japan)/  
KANJI (24 x 24)(in Japan) (Bit map font type: A, U, V)**

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

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

\* The shaded parts are Japanese.  
They are omitted here.

(2) UTF-8

| UTF-8 | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|
|       |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |
| 0     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 1     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 2     |   | ! | “ | # | \$ | % | & | ' | ( | ) | *  | +  | ,  | -  | .  | /  |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :  | ;  | <  | =  | >  | ?  |
| 4     | @ | A | B | C | D  | E | F | G | H | I | J  | K  | L  | M  | N  | O  |
| 5     | P | Q | R | S | T  | U | V | W | X | Y | Z  | [  | \  | ]  | ^  | _  |
| 6     | ' | a | b | c | d  | e | f | g | h | i | j  | k  | l  | m  | n  | o  |
| 7     | p | q | r | s | t  | u | v | w | x | y | z  | {  |    | }  | ~  |    |
| C28   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C29   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C2A   |   |   |   |   |    | ¥ |   |   |   |   |    |    |    | -  |    |    |
| C2B   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C38   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C39   |   | Ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3B   |   | ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C48   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C49   | Ð |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4B   |   | ł |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CB8   |   |   |   |   |    |   | ^ |   |   |   |    |    |    |    |    |    |
| CB9   |   |   |   |   |    |   |   |   |   |   |    |    | ~  |    |    |    |
| CBA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CBB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CC8   |   |   |   | ~ |    |   |   |   |   |   |    |    |    |    |    |    |
| CC9   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E2809 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E281B |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E282A |   |   |   |   |    |   |   |   |   |   |    |    | €  |    |    |    |
| E2889 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDA |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDB |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE8 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE9 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |

\* The shaded parts are Japanese. They are omitted here.

**12.8 STANDARD CHARACTER (outside Japan)** (Bit map font type: a)

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

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

\* The shaded parts are Japanese.  
They are omitted here.

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2) UTF-8

| UTF-8 | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|
|       |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |
| 0     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 1     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 2     |   | ! | “ | # | \$ | % | & | ' | ( | ) | *  | +  | ,  | -  | .  | /  |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :  | ;  | <  | =  | >  | ?  |
| 4     | @ | A | B | C | D  | E | F | G | H | I | J  | K  | L  | M  | N  | O  |
| 5     | P | Q | R | S | T  | U | V | W | X | Y | Z  | [  | \  | ]  | ^  | _  |
| 6     | ' | a | b | c | d  | e | f | g | h | i | j  | k  | l  | m  | n  | o  |
| 7     | p | q | r | s | t  | u | v | w | x | y | z  | {  |    | }  | ~  |    |
| C28   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C29   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C2A   |   |   |   |   |    | ¥ |   |   |   |   |    |    |    | -  |    |    |
| C2B   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C38   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C39   |   | Ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3B   |   | ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C48   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C49   | Ð |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4B   |   | ł |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CB8   |   |   |   |   |    |   | ^ |   |   |   |    |    |    |    |    |    |
| CB9   |   |   |   |   |    |   |   |   |   |   |    |    | ~  |    |    |    |
| CBA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CBB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CC8   |   |   |   | ~ |    |   |   |   |   |   |    |    |    |    |    |    |
| CC9   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E2809 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E281B |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E282A |   |   |   |   |    |   |   |   |   |   |    |    | €  |    |    |    |
| E2889 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDA |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDB |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE8 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE9 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |

\* The shaded parts are Japanese. They are omitted here.

**12.9 CHINESE CHARACTER (24 x 24) (outside Japan) (Bit map font type: r)**

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

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

(2) UTF-8 (Not supported)

| UTF-8 | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|
|       |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |
| 0     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 1     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 2     |   | ! | “ | # | \$ | % | & | ' | ( | ) | *  | +  | ,  | -  | .  | /  |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :  | ;  | <  | =  | >  | ?  |
| 4     | @ | A | B | C | D  | E | F | G | H | I | J  | K  | L  | M  | N  | O  |
| 5     | P | Q | R | S | T  | U | V | W | X | Y | Z  | [  | \  | ]  | ^  | _  |
| 6     | ' | a | b | c | d  | e | f | g | h | i | j  | k  | l  | m  | n  | o  |
| 7     | p | q | r | s | t  | u | v | w | x | y | z  | {  |    | }  | ~  |    |
| C28   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C29   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C2A   |   |   |   |   |    | ¥ |   |   |   |   |    |    |    | -  |    |    |
| C2B   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C38   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C39   |   | Ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3B   |   | ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C48   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C49   | Ð |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4B   |   | ł |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CB8   |   |   |   |   |    |   | ^ |   |   |   |    |    |    |    |    |    |
| CB9   |   |   |   |   |    |   |   |   |   |   |    |    | ~  |    |    |    |
| CBA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CBB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CC8   |   |   |   | ~ |    |   |   |   |   |   |    |    |    |    |    |    |
| CC9   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E2809 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E281B |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E282A |   |   |   |   |    |   |   |   |   |   |    |    | €  |    |    |    |
| E2889 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDA |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDB |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE8 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE9 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |

\* The shaded parts are Japanese. They are omitted here.



**12.10 KOREAN CHARACTER (24 x 24) (outside Japan) (Bit map font type: s)**

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

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

(2) UTF-8 (Not supported)

| UTF-8 | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|-------|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|
|       |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |
| 0     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 1     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| 2     |   | ! | “ | # | \$ | % | & | ' | ( | ) | *  | +  | ,  | -  | .  | /  |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :  | ;  | <  | =  | >  | ?  |
| 4     | @ | A | B | C | D  | E | F | G | H | I | J  | K  | L  | M  | N  | O  |
| 5     | P | Q | R | S | T  | U | V | W | X | Y | Z  | [  | \  | ]  | ^  | _  |
| 6     | ' | a | b | c | d  | e | f | g | h | i | j  | k  | l  | m  | n  | o  |
| 7     | p | q | r | s | t  | u | v | w | x | y | z  | {  |    | }  | ~  |    |
| C28   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C29   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C2A   |   |   |   |   |    | ¥ |   |   |   |   |    |    |    | -  |    |    |
| C2B   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C38   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C39   |   | Ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C3B   |   | ñ |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C48   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C49   | Ð |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4A   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| C4B   |   | 1 |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CB8   |   |   |   |   |    |   | ^ |   |   |   |    |    |    |    |    |    |
| CB9   |   |   |   |   |    |   |   |   |   |   |    |    | ~  |    |    |    |
| CBA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CBB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CC8   |   |   |   | ~ |    |   |   |   |   |   |    |    |    |    |    |    |
| CC9   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCA   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| CCB   |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E2809 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E281B |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| E282A |   |   |   |   |    |   |   |   |   |   |    |    | €  |    |    |    |
| E2889 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDA |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBDB |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE8 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |
| EFBE9 |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |

\* The shaded parts are Japanese. They are omitted here.

**12.11 BOLD CHARACTER** (Bit map font type: b)

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

|   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   | 0 |   |   |   |   |   |   |   |   |   |   |   | - |
| 1 |   | 1 |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 |   | 2 |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 |   | 3 |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 |   | 4 |   |   |   |   |   |   |   |   |   |   |   |   |
| 5 |   | 5 |   |   |   |   |   |   |   |   |   |   |   |   |
| 6 |   | 6 |   |   |   |   |   |   |   |   |   |   |   |   |
| 7 |   | 7 |   |   |   |   |   |   |   |   |   |   |   |   |
| 8 |   | 8 |   |   |   |   |   |   |   |   |   |   |   |   |
| 9 |   | 9 |   |   |   |   |   |   |   |   |   |   |   |   |
| A |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| B |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| D | - |   |   |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| F |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

- (2) UTF-8

|     | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-----|---|---|---|---|---|---|---|---|---|---|---------|---------|---------|---------|---------|---------|
| 0   |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| 1   |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| 2   |   |   |   |   |   |   |   |   |   |   |         |         |         | -       |         |         |
| 3   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |         |         |         |         |         |         |
| 4   |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| 5   |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| 6   |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| 7   |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| C28 |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| C29 |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |
| C2A |   |   |   |   |   |   |   |   |   |   |         |         |         | -       |         |         |
| C2B |   |   |   |   |   |   |   |   |   |   |         |         |         |         |         |         |

**12.12 PRICE CHARACTER 1/PRICE CHARACTER 2** (Bit map font type: d, e)

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

|   | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |    | 0 |   |   |   |   |   |   |   |   |   |   |   | - |
| 1 |    | 1 |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 |    | 2 |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 |    | 3 |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 | \$ | 4 |   |   |   |   |   |   |   |   |   |   |   |   |
| 5 |    | 5 |   |   |   |   |   |   |   |   |   |   |   |   |
| 6 |    | 6 |   |   |   |   |   |   |   |   |   |   |   |   |
| 7 |    | 7 |   |   |   |   |   |   |   |   |   |   |   |   |
| 8 |    | 8 |   |   |   |   |   |   |   |   |   |   |   |   |
| 9 |    | 9 |   |   |   |   |   |   |   |   |   |   |   |   |
| A |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
| B |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
| C | ,  |   |   | ¥ |   |   |   |   |   |   |   |   |   |   |
| D | -  |   |   |   |   |   |   |   |   |   |   |   |   |   |
| E | .  |   |   |   |   |   |   |   |   | ¥ |   |   |   |   |
| F |    |   |   |   |   |   | 円 |   |   |   |   |   |   |   |

\* Code 5CH for “¥” indicates “ ” in the international setting.

- (2) UTF-8

|       | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-------|---|---|---|---|----|---|---|---|---|---|---------|---------|---------|---------|---------|---------|
| 0     |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 1     |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 2     |   |   |   |   | \$ |   |   |   |   |   |         |         | ,       | -       | .       |         |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 |         |         |         |         |         |         |
| 4     |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 5     |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 6     |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| 7     |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C28   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C29   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| C2A   |   |   |   |   | ¥  |   |   |   |   |   |         |         |         | -       |         |         |
| C2B   |   |   |   |   |    |   |   |   |   |   |         |         |         |         |         |         |
| E5868 |   |   |   |   |    |   | 円 |   |   |   |         |         |         |         |         |         |

### 12.13 TEC OUTLINE FONT 1 (Outline font type: A, B, K)

(1) When any Japanese message is selected in the SYSTEM mode:

(1.1) PC-850, PC-8, PC-852, PC-857

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

\* The shaded parts are Japanese.  
They are omitted here.

(2) When any message other than Japanese is selected in the SYSTEM mode:

(2.1) PC-850

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.2) PC-8

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9  | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|----|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç | É  | á | € |   |   | α | ≡ |
| 1 |   |   | !  | 1 | A | Q | a | q | ü | æ  | í | € |   |   | β | ± |
| 2 |   |   | "  | 2 | B | R | b | r | é | Æ  | ó |   |   |   | Γ | ≥ |
| 3 |   |   | #  | 3 | C | S | c | s | â | ô  | ú |   |   |   | π | ≤ |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | ö  | ñ |   |   |   | Σ |   |
| 5 |   |   | %  | 5 | E | U | e | u | à | ò  | Ñ |   |   |   | σ | ] |
| 6 |   |   | &  | 6 | F | V | f | v | å | û  | ¬ |   |   |   | μ | ÷ |
| 7 |   |   | '  | 7 | G | W | g | w | ç | ù  | ^ |   |   |   | τ | ≈ |
| 8 |   |   | (  | 8 | H | X | h | x | ê | ÿ  | ¿ |   |   |   | Φ | ° |
| 9 |   |   | )  | 9 | I | Y | i | y | ë | Ö  |   |   |   |   | Θ | • |
| A |   |   | *  | : | J | Z | j | z | è | Ü  | ¬ |   |   |   | Ω | • |
| B |   |   | +  | ; | K | [ | k | { | ï | ç  | ½ |   |   |   | δ | √ |
| C |   |   | ,  | < | L | \ | l |   | î | £  | ¼ |   |   |   | ∞ | · |
| D |   |   | -  | = | M | ] | m | } | ì | ¥  | ì |   |   |   | ∅ | ₂ |
| E |   |   | .  | > | N | ^ | n | ~ | Ä | Pt | « |   |   |   | ε | ■ |
| F |   |   | /  | ? | O | _ | o | Δ | Å | f  | » |   |   |   | ∩ |   |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.3) PC-852

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç | É | á | € |   |   |   | - |
| 1 |   |   | !  | 1 | A | Q | a | q | ü |   | í | € |   |   | ß |   |
| 2 |   |   | "  | 2 | B | R | b | r | é |   | ó |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s | â | ô | ú |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | ö |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   |   |   |   |   | § |
| 6 |   |   | &  | 6 | F | V | f | v |   |   |   |   |   |   |   | ÷ |
| 7 |   |   | '  | 7 | G | W | g | w | ç |   |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | h | x |   |   |   |   |   |   |   | ° |
| 9 |   |   | )  | 9 | I | Y | i | y | ë | Ö |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | j | z |   | Ü | ¬ |   |   |   |   | • |
| B |   |   | +  | ; | K | [ | k | { |   |   |   |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   | î |   |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ | Ä |   | « |   |   |   |   | ■ |
| F |   |   | /  | ? | O | _ | o | Δ |   |   | » |   | α |   |   |   |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.4) PC-857

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.5) PC-851

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p | Ç |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q | ü |   |   | € |   |   |   | ± |
| 2 |   |   | "  | 2 | B | R | b | r | é |   |   |   |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s | â | ô |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t | ä | ö |   |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u | à |   |   |   |   |   |   | § |
| 6 |   |   | &  | 6 | F | V | f | v |   | û |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | g | w | ç | ù |   |   |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | h | x | ê |   |   |   |   |   |   | ° |
| 9 |   |   | )  | 9 | I | Y | i | y | ë | Ö |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | j | z | è | Ü |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { | ï |   | ½ |   |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   | î | £ |   |   |   |   |   |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ | Ä |   | « |   |   |   |   | ■ |
| F |   |   | /  | ? | O | _ | o | Δ |   |   | » |   |   |   |   |   |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.6) PC-855

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.7) PC-1250

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | € |   |   | á |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   |   |   |   |   | â |   |
| 3 |   |   | #  | 3 | C | S | c | s |   |   |   |   |   |   |   | ó |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | α |   | Ä |   | ä | ô |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   | μ |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | f | v |   |   |   |   |   | Ö |   | ö |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | · | Ç |   | ç | ÷ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   |   |   | É |   | é |   |
| A |   |   | *  | : | J | Z | j | z |   |   |   |   |   |   |   | ú |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » |   |   | ë |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ |   |   | Ü |   | ü |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   | í |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   |   |   |   |   | î |   |
| F |   |   | /  | ? | O | _ | o | Δ |   |   |   |   |   | ß |   |   |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.



(2.8) PC-1251

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.9) PC-1252

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.10) PC-1253

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | € |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   |   | ² |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s | f |   | £ |   |   |   |   |   |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ |   |   |   |   |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   | ¥ | μ |   |   |   |   |
| 6 |   |   | &  | 6 | F | V | f | v |   |   |   |   |   |   |   |   |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | . |   |   |   |   |
| 8 |   |   | (  | 8 | H | X | h | x |   |   |   |   |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   |   |   |   |   |   |   |
| A |   |   | *  | : | J | Z | j | z |   |   | ¬ |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ |   |   |   |   |   |
| D |   |   | -  | = | M | ] | m | } |   |   |   | ½ |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | o | Δ |   |   |   |   |   |   |   |   |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.11) PC-1254

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.12) PC-1257

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   |   |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   |   | € |   |   |   |   |
| 2 |   |   | "  | 2 | B | R | b | r |   |   | ¢ | ² |   |   |   |   |
| 3 |   |   | #  | 3 | C | S | c | s |   |   | £ |   |   |   |   | ó |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ |   | Ä |   | ä |   |
| 5 |   |   | %  | 5 | E | U | e | u |   |   |   | μ | Å |   | å | ö |
| 6 |   |   | &  | 6 | F | V | f | v |   |   |   |   |   | Ö |   | ö |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | · |   |   |   | ÷ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   | Ø | ø |   |   |   |   |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   |   |   | É |   | é |   |
| A |   |   | *  | : | J | Z | j | z |   |   |   |   |   |   |   |   |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » |   |   |   |   |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ | ¼ |   | Ü |   | ü |
| D |   |   | -  | = | M | ] | m | } |   |   |   | ½ |   |   |   |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  | ? | O | _ | o | Δ |   |   | Æ | æ |   | ß |   |   |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.13) LATIN9

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | @ | P | ` | p |   |   |   | € |   |   | à |   |
| 1 |   |   | !  | 1 | A | Q | a | q |   |   | ı | € |   | Ñ | á | ñ |
| 2 |   |   | "  | 2 | B | R | b | r |   |   | ¢ | ² |   |   | â | ò |
| 3 |   |   | #  | 3 | C | S | c | s |   |   | £ |   |   |   | ã | ó |
| 4 |   |   | \$ | 4 | D | T | d | t |   |   | ¤ |   | Ä |   | ä | ô |
| 5 |   |   | %  | 5 | E | U | e | u |   |   | ¥ | μ | Å |   | å | ö |
| 6 |   |   | &  | 6 | F | V | f | v |   |   |   |   | Æ | Ö | æ | ö |
| 7 |   |   | '  | 7 | G | W | g | w |   |   | § | · | Ç |   | ç | ÷ |
| 8 |   |   | (  | 8 | H | X | h | x |   |   |   |   |   | Ø | è | ø |
| 9 |   |   | )  | 9 | I | Y | i | y |   |   |   |   | É |   | é | ù |
| A |   |   | *  | : | J | Z | j | z |   |   | ¬ | ^ |   |   | ê | ú |
| B |   |   | +  | ; | K | [ | k | { |   |   | « | » |   |   | ë | û |
| C |   |   | ,  | < | L | \ | l |   |   |   | ¬ |   |   | Ü | ì | ü |
| D |   |   | -  | = | M | ] | m | } |   |   |   |   |   |   | í |   |
| E |   |   | .  | > | N | ^ | n | ~ |   |   |   |   |   |   | î |   |
| F |   |   | /  | ? | O | _ | o |   |   |   |   | ¿ |   | ß | ï | ÿ |

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(2.14) Arabic

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

The Euro code (B0H) can be changed in the parameter setting in the SYSTEM mode.

(3) UTF-8

|      | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10<br>A      | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|------|---|---|---|---|----|---|---|---|---|---|--------------|---------|---------|---------|---------|---------|
| 0    |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| 1    |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| 2    |   | ! | " | # | \$ | % | & | ' | ( | ) | *            | +       | ,       | -       | .       | /       |
| 3    | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | :            | ;       | <       | =       | >       | ?       |
| 4    | @ | A | B | C | D  | E | F | G | H | I | J            | K       | L       | M       | N       | O       |
| 5    | P | Q | R | S | T  | U | V | W | X | Y | Z            | [       | \       | ]       | ^       | _       |
| 6    | ' | a | b | c | d  | e | f | g | h | i | j            | k       | l       | m       | n       | o       |
| 7    | p | q | r | s | t  | u | v | w | x | y | z            | {       |         | }       | ~       | Δ       |
| C280 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C290 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C2A0 |   | ı | ç | £ | ¤  | ¥ |   | § |   |   | <sup>a</sup> | «       | ¬       | -       |         |         |
| C2B0 | ° | ± | ² |   |    | μ |   | • |   |   | <sup>o</sup> | »       | ¼       | ½       |         | ¿       |
| C380 |   |   |   |   | Ä  | Å | Æ | Ç |   | É |              |         |         |         |         |         |
| C390 |   | Ñ |   |   |    |   | Ö |   | Ø |   |              |         | Ü       |         |         | ß       |
| C3A0 | à | á | â | ã | ä  | å | æ | ç | è | é | ê            | ë       | ì       | í       | î       | ï       |
| C3B0 |   | ñ | ò | ó | ô  | õ | ö | ÷ | ø | ù | ú            | û       | ü       |         |         | ÿ       |
| C680 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C690 |   |   | f |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C6A0 |   |   |   |   |    |   |   |   |   | Σ |              |         |         |         |         |         |
| C6B0 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C980 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C990 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C9A0 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| C9B0 |   |   |   |   |    |   |   | φ |   |   |              |         |         |         |         |         |
| CB80 |   |   |   |   |    |   | ˆ |   |   |   |              |         |         |         |         |         |
| CB90 |   |   |   |   |    |   |   |   |   | • |              |         | ˜       |         |         |         |
| CBA0 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| CBB0 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| CC80 |   |   | ˘ |   |    |   |   |   |   |   | •            |         |         |         |         |         |
| CC90 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| CCA0 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |
| CCB0 |   |   |   |   |    |   |   |   |   |   |              |         |         |         |         |         |

|       | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7  | 8 | 9 | 10<br>A | 11<br>B | 12<br>C | 13<br>D | 14<br>E | 15<br>F |
|-------|---|---|---|---|---|---|---|----|---|---|---------|---------|---------|---------|---------|---------|
| CE80  |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| CE90  |   |   |   | Γ |   |   |   |    | Θ |   |         |         |         |         |         |         |
| CEA0  |   |   |   | Σ |   |   | Φ |    |   | Ω |         |         |         |         |         |         |
| CEB0  |   | α | β |   | δ | ε |   |    |   |   |         |         | μ       |         |         |         |
| CF80  | π |   |   | σ | τ |   | φ |    |   |   |         |         |         |         |         |         |
| CF90  |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| CFA0  |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| CFB0  |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| E2809 |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| E281B |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         | n       |
| E282A |   |   |   |   |   |   |   | Pt |   |   |         |         | €       |         |         |         |
| E2889 |   |   |   |   |   |   |   |    |   | ▪ | √       |         |         |         | ∞       |         |
| E288A |   |   |   |   |   |   |   |    |   | ∩ |         |         |         |         |         |         |
| E2898 |   |   |   |   |   |   |   |    | ≈ |   |         |         |         |         |         |         |
| E289A |   | ≡ |   |   | ≤ | ≥ |   |    |   |   |         |         |         |         |         |         |
| E28C9 | ▮ |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| E28CA | ƒ | J |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| E296A | ▪ |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| E5868 |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| EFBDA |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| EFBDB |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| EFBE8 |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |
| EFBE9 |   |   |   |   |   |   |   |    |   |   |         |         |         |         |         |         |

\* The shaded parts are Japanese. They are omitted here.

**12.14 PRICE FONT 1, 2, 3** (Outline font type: E, F, G)

- (1) Other than UTF-8 (PC-850, PC-852, PC-857, PC-8, PC-851, PC-855, PC-1250, PC-1251, PC-1252, PC-1253, PC-1254, PC-1257, LATIN9, Arabic, PC-866)

|   | 0 | 1 | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |   |   |    | 0 | 円 |   |   |   |   |   |   |   |   |   |   | - |
| 1 |   |   |    | 1 |   |   |   |   |   |   |   |   |   |   |   |   |
| 2 |   |   |    | 2 |   |   |   |   |   |   |   |   |   |   |   |   |
| 3 |   |   |    | 3 |   |   |   |   |   |   |   |   |   |   |   |   |
| 4 |   |   | \$ | 4 |   |   |   |   |   |   |   |   |   |   |   |   |
| 5 |   |   | %  | 5 |   |   |   |   |   |   |   |   |   |   |   |   |
| 6 |   |   |    | 6 |   |   |   |   |   |   |   |   |   |   |   |   |
| 7 |   |   |    | 7 |   |   |   |   |   |   |   |   |   |   |   |   |
| 8 |   |   |    | 8 |   |   |   |   |   |   |   |   |   |   |   |   |
| 9 |   |   |    | 9 |   |   |   |   |   |   |   |   |   |   |   |   |
| A |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
| B |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |
| C |   |   | ,  |   | ¥ |   |   |   |   |   |   |   |   |   |   |   |
| D |   |   | -  |   |   |   |   |   |   |   |   |   |   |   |   |   |
| E |   |   | .  |   |   |   |   | ~ |   |   |   |   |   |   |   |   |
| F |   |   | /  |   |   |   |   |   |   |   |   |   |   |   |   |   |

- (2) UTF-8

|       | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |  |
|-------|---|---|---|---|----|---|---|---|---|---|----|----|----|----|----|----|--|
|       |   |   |   |   |    |   |   |   |   |   | A  | B  | C  | D  | E  | F  |  |
| 0     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |  |
| 1     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |  |
| 2     |   |   |   |   | \$ | % |   |   |   |   |    |    | ,  | -  | .  | /  |  |
| 3     | 0 | 1 | 2 | 3 | 4  | 5 | 6 | 7 | 8 | 9 |    |    |    |    |    |    |  |
| 4     | 円 |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |  |
| 5     |   |   |   |   |    |   |   |   |   |   |    |    | ¥  |    |    |    |  |
| 6     |   |   |   |   |    |   |   |   |   |   |    |    |    |    |    |    |  |
| 7     |   |   |   |   |    |   |   |   |   |   |    |    |    | ~  |    |    |  |
| E5868 |   |   |   |   |    |   | 円 |   |   |   |    |    |    |    |    |    |  |

## **16. BARCODE/TWO-DIMENSIONAL CODE TABLE**

### **16.1 GENERAL DESCRIPTION**

This chapter provides the barcode/two-dimensional code tables. Note that some barcodes/two-dimensional codes are not supported depending on the print mode.



**16.2 JAN8/EAN8, JAN13/EAN13, UPC-E, UPC-A, UCC/EAN128, EAN128, Interleaved 2 of 5 (ITF), MSI, Industrial 2 of 5, RSS-14, RSS-14 Stacked, RSS-14 Stacked Omni-directional, RSS Limited, EAN13 + 2 digits, EAN13 + 5 digits, UPC-E + 2 digits, UPC-E + 5 digits, EAN8 + 2 digits, EAN8 + 5 digits, UPC-A + 2 digits, UPC-A + 5 digits**

WPC (JAN, EAN, UPC)

ITF/MSI/UCC, EAN128

|   | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 0 |   | 0 |   |   |   |   |
| 1 |   | 1 |   |   |   |   |
| 2 |   | 2 |   |   |   |   |
| 3 |   | 3 |   |   |   |   |
| 4 |   | 4 |   |   |   |   |
| 5 |   | 5 |   |   |   |   |
| 6 |   | 6 |   |   |   |   |
| 7 |   | 7 |   |   |   |   |
| 8 |   | 8 |   |   |   |   |
| 9 |   | 9 |   |   |   |   |
| A |   |   |   |   |   |   |
| B |   |   |   |   |   |   |
| C |   |   |   |   |   |   |
| D |   |   |   |   |   |   |
| E |   |   |   |   |   |   |
| F |   |   |   |   |   |   |

**16.3 CUSTOMER BARCODE**

|   | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 0 |   | 0 |   | P |   |   |
| 1 |   | 1 | A | Q |   |   |
| 2 |   | 2 | B | R |   |   |
| 3 |   | 3 | C | S |   |   |
| 4 |   | 4 | D | T |   |   |
| 5 |   | 5 | E | U |   |   |
| 6 |   | 6 | F | V |   |   |
| 7 |   | 7 | G | W |   |   |
| 8 |   | 8 | H | X |   |   |
| 9 |   | 9 | I | Y |   |   |
| A |   |   | J | Z |   |   |
| B |   |   | K |   |   |   |
| C |   |   | L |   |   |   |
| D | - |   | M |   |   |   |
| E |   |   | N |   |   |   |
| F |   |   | O |   |   |   |

**16.4 POSTNET**

|   | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 0 |   | 0 |   |   |   |   |
| 1 |   | 1 |   |   |   |   |
| 2 |   | 2 |   |   |   |   |
| 3 |   | 3 |   |   |   |   |
| 4 |   | 4 |   |   |   |   |
| 5 |   | 5 |   |   |   |   |
| 6 |   | 6 |   |   |   |   |
| 7 |   | 7 |   |   |   |   |
| 8 |   | 8 |   |   |   |   |
| 9 |   | 9 |   |   |   |   |
| A |   |   |   |   |   |   |
| B |   |   |   |   |   |   |
| C |   |   |   |   |   |   |
| D |   |   |   |   |   |   |
| E |   |   |   |   |   |   |
| F |   |   |   |   |   |   |

**16.5 RM4SCC**

|   | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 0 |   | 0 |   | P |   |   |
| 1 |   | 1 | A | Q |   |   |
| 2 |   | 2 | B | R |   |   |
| 3 |   | 3 | C | S |   |   |
| 4 |   | 4 | D | T |   |   |
| 5 |   | 5 | E | U |   |   |
| 6 |   | 6 | F | V |   |   |
| 7 |   | 7 | G | W |   |   |
| 8 | ( | 8 | H | X |   |   |
| 9 | ) | 9 | I | Y |   |   |
| A |   |   | J | Z |   |   |
| B |   |   | K |   |   |   |
| C |   |   | L |   |   |   |
| D |   |   | M |   |   |   |
| E |   |   | N |   |   |   |
| F |   |   | O |   |   |   |

## 16.6 KIX CODE

|   | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| 0 |   | 0 |   | P |   | p |
| 1 |   | 1 | A | Q | a | q |
| 2 |   | 2 | B | R | b | r |
| 3 |   | 3 | C | S | c | s |
| 4 |   | 4 | D | T | d | t |
| 5 |   | 5 | E | U | e | u |
| 6 |   | 6 | F | V | f | v |
| 7 |   | 7 | G | W | g | w |
| 8 |   | 8 | H | X | h | x |
| 9 |   | 9 | I | Y | i | y |
| A |   |   | J | Z | j | z |
| B |   |   | K |   | k |   |
| C |   |   | L |   | l |   |
| D |   |   | M |   | m |   |
| E |   |   | N |   | n |   |
| F |   |   | O |   | o |   |

**NOTE:** “(,)” in the above table is used only as the start/stop codes. It should not be included in the middle of data. In this case, a barcode is not drawn.

**16.7 CODE39 (Standard)**

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

### 16.8 CODE39 (Full ASCII)

[Transfer code]

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



[Drawing code]

|   | 2  | 3  | 4  | 5  | 6  | 7  |
|---|----|----|----|----|----|----|
| 0 | SP | 0  | %V | P  | %W | +P |
| 1 | /A | 1  | A  | Q  | +A | +Q |
| 2 | /B | 2  | B  | R  | +B | +R |
| 3 | /C | 3  | C  | S  | +C | +S |
| 4 | /D | 4  | D  | T  | +D | +T |
| 5 | /E | 5  | E  | U  | +E | +U |
| 6 | /F | 6  | F  | V  | +F | +V |
| 7 | /G | 7  | G  | W  | +G | +W |
| 8 | /H | 8  | H  | X  | +H | +X |
| 9 | /I | 9  | I  | Y  | +I | +Y |
| A | /J | /Z | J  | Z  | +J | +Z |
| B | /K | %F | K  | %K | +K | %P |
| C | /L | %G | L  | %L | +L | %Q |
| D | -  | %H | M  | %M | +M | %R |
| E | .  | %I | N  | %N | +N | %S |
| F | /O | %J | O  | %O | +O | %T |

16.9 NW-7

|   | 2  | 3 | 4 | 5 | 6 | 7 |
|---|----|---|---|---|---|---|
| 0 | SP | 0 |   |   | ` |   |
| 1 |    | 1 | A |   | a |   |
| 2 |    | 2 | B |   | b |   |
| 3 |    | 3 | C |   | c |   |
| 4 | \$ | 4 | D |   | d | t |
| 5 |    | 5 |   |   | e |   |
| 6 |    | 6 |   |   |   |   |
| 7 |    | 7 |   |   |   |   |
| 8 |    | 8 |   |   |   |   |
| 9 |    | 9 |   |   |   |   |
| A | *  | : |   |   |   |   |
| B | +  |   |   |   |   |   |
| C |    |   |   |   |   |   |
| D | -  |   |   |   |   |   |
| E | .  |   |   |   | n |   |
| F | /  |   |   |   |   |   |

16.10 CODE93

[Transfer code]

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



[Drawing code]

|   | 2  | 3  | 4  | 5  | 6  | 7  |
|---|----|----|----|----|----|----|
| 0 | SP | 0  | %V | P  | %W | +P |
| 1 | /A | 1  | A  | Q  | +A | +Q |
| 2 | /B | 2  | B  | R  | +B | +R |
| 3 | /C | 3  | C  | S  | +C | +S |
| 4 | /D | 4  | D  | T  | +D | +T |
| 5 | /E | 5  | E  | U  | +E | +U |
| 6 | /F | 6  | F  | V  | +F | +V |
| 7 | /G | 7  | G  | W  | +G | +W |
| 8 | /H | 8  | H  | X  | +H | +X |
| 9 | /I | 9  | I  | Y  | +I | +Y |
| A | /J | /Z | J  | Z  | +J | +Z |
| B | +  | %F | K  | %K | +K | %P |
| C | /L | %G | L  | %L | +L | %Q |
| D | -  | %H | M  | %M | +M | %R |
| E | .  | %I | N  | %N | +N | %S |
| F | /  | %J | O  | %O | +O | %T |



## 16.11 CODE128

### 16.11.1 TRANSFER CODE

|   | -   | -   | 2  | 3 | 4 | 5 | 6 | 7 |
|---|-----|-----|----|---|---|---|---|---|
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p |
| 1 | SOH | DC1 | !  | 1 | A | Q | a | q |
| 2 | STX | DC2 | "  | 2 | B | R | b | r |
| 3 | ETX | DC3 | #  | 3 | C | S | c | s |
| 4 | EOT | DC4 | \$ | 4 | D | T | d | t |
| 5 | ENQ | NAK | %  | 5 | E | U | e | u |
| 6 | ACK | SYN | &  | 6 | F | V | f | v |
| 7 | BEL | ETB | '  | 7 | G | W | g | w |
| 8 | BS  | CAN | (  | 8 | H | X | h | x |
| 9 | HT  | EM  | )  | 9 | I | Y | i | y |
| A | LF  | SUB | *  | : | J | Z | j | z |
| B | VT  | ESC | +  | ; | K | [ | k | { |
| C | FF  | FS  | ,  | < | L | \ | l |   |
| D | CR  | GS  | -  | = | M | ] | m | } |
| E | SO  | RS  | .  | > | N | ^ | n | ~ |
| F | SI  | US  | /  | ? | O | _ | o | Δ |



[Drawing code]

Value Code Table

### 16.11.2 HOW TO TRANSMIT THE CONTROL CODE DATA

|           |   |                |
|-----------|---|----------------|
| NUL (00H) | → | > @ (3EH, 40H) |
| SOH (01H) | → | > A (3EH, 41H) |
| STX (02H) | → | > B (3EH, 42H) |
| ⇕         |   |                |
| GS (1DH)  | → | > ] (3EH, 5DH) |
| RS (1EH)  | → | > ^ (3EH, 5EH) |
| US (1FH)  | → | > _ (3EH, 5FH) |

### 16.11.3 HOW TO TRANSMIT THE SPECIAL CODES

|                  |   |     |
|------------------|---|-----|
| Value            |   |     |
| 30 (Character >) | → | > 0 |
| 95               | → | > 1 |
| 96               | → | > 2 |
| 97               | → | > 3 |
| 98               | → | > 4 |
| 99               | → | > 5 |
| 100              | → | > 6 |
| 101              | → | > 7 |
| 102              | → | > 8 |

### 16.11.4 DESIGNATION OF START CODE

|                |   |     |
|----------------|---|-----|
| START (CODE A) | → | > 7 |
| START (CODE B) | → | > 6 |
| START (CODE C) | → | > 5 |

16.11.5 VALUE CODE TABLE

| VALUE | CODE<br>A | CODE<br>B | CODE<br>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    | >         | >         | 30        |
| 31    | ?         | ?         | 31        |
| 32    | @         | @         | 32        |
| 33    | A         | A         | 33        |
| 34    | B         | B         | 34        |
| 35    | C         | C         | 35        |

| VALUE | CODE<br>A | CODE<br>B | CODE<br>C |
|-------|-----------|-----------|-----------|
| 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        |
| 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       | `         | 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        |

| VALUE | CODE<br>A | CODE<br>B | CODE<br>C |
|-------|-----------|-----------|-----------|
| 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       | p         | 80        |
| 81    | DC1       | q         | 81        |
| 82    | DC2       | r         | 82        |
| 83    | DC3       | s         | 83        |
| 84    | DC4       | t         | 84        |
| 85    | NAK       | u         | 85        |
| 86    | SYN       | v         | 86        |
| 87    | ETB       | w         | 87        |
| 88    | CAN       | x         | 88        |
| 89    | EM        | y         | 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      | FNC2      | 97        |
| 98    | SHIFT     | SHIFT     | 98        |
| 99    | CODE C    | CODE C    | 99        |
| 100   | CODE B    | FNC4      | CODE B    |
| 101   | FNC4      | CODE A    | CODE A    |
| 102   | FNC1      | FNC1      | FNC1      |

|     |              |
|-----|--------------|
| 103 | START CODE A |
| 104 | START CODE B |
| 105 | START CODE C |

16.11.6 RSS EXPANDED, RSS EXPANDED STACKED

[Transfer code]

|   |  |  | 2    | 3 | 4 | 5 | 6 | 7 |  |  |  |  |  |  |  |  |
|---|--|--|------|---|---|---|---|---|--|--|--|--|--|--|--|--|
| 0 |  |  | SP   | 0 |   | P |   | p |  |  |  |  |  |  |  |  |
| 1 |  |  | !    | 1 | A | Q | a | q |  |  |  |  |  |  |  |  |
| 2 |  |  | "    | 2 | B | R | b | r |  |  |  |  |  |  |  |  |
| 3 |  |  | FNC1 | 3 | C | S | c | s |  |  |  |  |  |  |  |  |
| 4 |  |  |      | 4 | D | T | d | t |  |  |  |  |  |  |  |  |
| 5 |  |  | %    | 5 | E | U | e | u |  |  |  |  |  |  |  |  |
| 6 |  |  | &    | 6 | F | V | f | v |  |  |  |  |  |  |  |  |
| 7 |  |  | '    | 7 | G | W | g | w |  |  |  |  |  |  |  |  |
| 8 |  |  | (    | 8 | H | X | h | x |  |  |  |  |  |  |  |  |
| 9 |  |  | )    | 9 | I | Y | i | y |  |  |  |  |  |  |  |  |
| A |  |  | *    | : | J | Z | j | z |  |  |  |  |  |  |  |  |
| B |  |  | +    | ; | K |   | k |   |  |  |  |  |  |  |  |  |
| C |  |  | ,    | < | L |   | l |   |  |  |  |  |  |  |  |  |
| D |  |  | -    | = | M |   | m |   |  |  |  |  |  |  |  |  |
| E |  |  | .    | > | N |   | n |   |  |  |  |  |  |  |  |  |
| F |  |  | /    | ? | O | _ | o |   |  |  |  |  |  |  |  |  |

## 16.12 DATA MATRIX

### 16.12.1 FORMAT ID

The code to be used is designated using the format ID.

| Format ID | Code                   | Details                     |
|-----------|------------------------|-----------------------------|
| 1         | Numerics               | 0 to 9 space                |
| 2         | Letters                | A to Z space                |
| 3         | Alphanumerics, symbols | 0 to 9 A to Z space . , - / |
| 4         | Alphanumerics          | 0 to 9 A to Z space         |
| 5         | ASCII (7-bit)          | 00H to 7FH                  |
| 6         | ISO (8-bit)            | 00H to FFH (Kanji)          |

### 16.12.2 TRANSFER CODE

|   | 0   | 1   | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|-----|-----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p |   |   |   |   |   |   |   |   |
| 1 | SOH | DC1 | !  | 1 | A | Q | a | q |   |   |   |   |   |   |   |   |
| 2 | STX | DC2 | "  | 2 | B | R | b | r |   |   |   |   |   |   |   |   |
| 3 | ETX | DC3 | #  | 3 | C | S | c | s |   |   |   |   |   |   |   |   |
| 4 | EOT | DC4 | \$ | 4 | D | T | d | t |   |   |   |   |   |   |   |   |
| 5 | ENQ | NAK | %  | 5 | E | U | e | u |   |   |   |   |   |   |   |   |
| 6 | ACK | SYN | &  | 6 | F | V | f | v |   |   |   |   |   |   |   |   |
| 7 | BEL | ETB | '  | 7 | G | W | g | w |   |   |   |   |   |   |   |   |
| 8 | BS  | CAN | (  | 8 | H | X | h | x |   |   |   |   |   |   |   |   |
| 9 | HT  | EM  | )  | 9 | I | Y | i | y |   |   |   |   |   |   |   |   |
| A | LF  | SUB | *  | : | J | Z | j | z |   |   |   |   |   |   |   |   |
| B | VT  | ESC | +  | ; | K | [ | k | { |   |   |   |   |   |   |   |   |
| C | FF  | FS  | ,  | < | L | \ | l |   |   |   |   |   |   |   |   |   |
| D | CR  | GS  | -  | = | M | ] | m | } |   |   |   |   |   |   |   |   |
| E | SO  | RS  | .  | > | N | ^ | n | ~ |   |   |   |   |   |   |   |   |
| F | SI  | US  | /  | ? | O | _ | o | △ |   |   |   |   |   |   |   |   |

### 16.12.3 HOW TO TRANSMIT THE CONTROL CODE DATA

NUL (00H) → > @ (3EH, 40H)  
 SOH (01H) → > A (3EH, 41H)  
 STX (02H) → > B (3EH, 42H)  
 ⇕  
 GS (1DH) → > ] (3EH, 5DH)  
 RS (1EH) → > ^ (3EH, 5EH)  
 US (1FH) → > \_ (3EH, 5FH)

### 16.12.4 HOW TO TRANSMIT THE SPECIAL CODES

> (3EH) → > 0 (3EH, 30H)

### 16.12.5 HOW TO TRANSMIT THE KANJI CODES

- Shift JIS
- JIS hexadecimal  
(For details, refer to the section for the Barcode Data Command.)

## 16.13 PDF417, MicroPDF417

### 16.13.1 MODE/CODE

The following modes are automatically selected according to the code used.

[PDF417]

| Mode                    | Code                               | Details                                                                                             |
|-------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------|
| EXC mode                | Alphanumerics, symbols             | 0 to 9 A to Z a to z space ! " # \$ % & ' ( ) * + , - . / : ; < = > ? @ [ \ ] ^ _ ` {   } ~ Δ CR HT |
| Binary/ASCII Plus mode  | Binary International Character Set | 00H to FFH (Kanji)                                                                                  |
| Numeric Compaction mode | Numerics                           | 0 to 9                                                                                              |

[MicroPDF417]

| Mode                               | Details            |
|------------------------------------|--------------------|
| Upper case letters, space          | A to Z space       |
| Binary international character set | 00H to FFH (Kanji) |
| Numerics                           | 0 to 9             |

### 16.13.2 TRANSFER CODE

|   | 0   | 1   | 2  | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|-----|-----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p |   |   |   |   |   |   |   |   |
| 1 | SOH | DC1 | !  | 1 | A | Q | a | q |   |   |   |   |   |   |   |   |
| 2 | STX | DC2 | "  | 2 | B | R | b | r |   |   |   |   |   |   |   |   |
| 3 | ETX | DC3 | #  | 3 | C | S | c | s |   |   |   |   |   |   |   |   |
| 4 | EOT | DC4 | \$ | 4 | D | T | d | t |   |   |   |   |   |   |   |   |
| 5 | ENQ | NAK | %  | 5 | E | U | e | u |   |   |   |   |   |   |   |   |
| 6 | ACK | SYN | &  | 6 | F | V | f | v |   |   |   |   |   |   |   |   |
| 7 | BEL | ETB | '  | 7 | G | W | g | w |   |   |   |   |   |   |   |   |
| 8 | BS  | CAN | (  | 8 | H | X | h | x |   |   |   |   |   |   |   |   |
| 9 | HT  | EM  | )  | 9 | I | Y | i | y |   |   |   |   |   |   |   |   |
| A | LF  | SUB | *  | : | J | Z | j | z |   |   |   |   |   |   |   |   |
| B | VT  | ESC | +  | ; | K | [ | k | { |   |   |   |   |   |   |   |   |
| C | FF  | FS  | ,  | < | L | \ | l |   |   |   |   |   |   |   |   |   |
| D | CR  | GS  | -  | = | M | ] | m | } |   |   |   |   |   |   |   |   |
| E | SO  | RS  | .  | > | N | ^ | n | ~ |   |   |   |   |   |   |   |   |
| F | SI  | US  | /  | ? | O | _ | o | Δ |   |   |   |   |   |   |   |   |

### 16.13.3 HOW TO TRANSMIT THE CONTROL CODE DATA

NUL (00H) → > @ (3EH, 40H)  
 SOH (01H) → > A (3EH, 41H)  
 STX (02H) → > B (3EH, 42H)  
 ⇕  
 GS (1DH) → > ] (3EH, 5DH)  
 RS (1EH) → > ^ (3EH, 5EH)  
 US (1FH) → > \_ (3EH, 5FH)

### 16.13.4 HOW TO TRANSMIT THE SPECIAL CODES

> (3EH) → > 0 (3EH, 30H)

### 16.13.5 HOW TO TRANSMIT THE KANJI CODES

- Shift JIS
- JIS hexadecimal  
(For details, refer to the section for the Barcode Data Command.)

## 16.14 QR CODE

### 16.14.1 MODE SELECTION

When manual mode is selected in the Format Command

- Numeric mode, alphanumeric and symbol mode, Kanji mode

|                |                    |
|----------------|--------------------|
| Mode selection | Data to be printed |
|----------------|--------------------|

- Binary mode

|                |                                   |                    |
|----------------|-----------------------------------|--------------------|
| Mode selection | No. of data strings<br>(4 digits) | Data to be printed |
|----------------|-----------------------------------|--------------------|

- Mixed mode

|      |             |      |             |      |
|------|-------------|------|-------------|------|
| Data | “,” (comma) | Data | “,” (comma) | Data |
|------|-------------|------|-------------|------|

QR code can handle all codes including alphanumerics, symbols and Kanji. Since the data compression rate varies according to the code, a code to be used is designated when the mode is selected.

| Mode | Code                      | Details                                 |
|------|---------------------------|-----------------------------------------|
| N    | Numerics                  | 0 to 9                                  |
| A    | Alphanumerics,<br>symbols | A to Z 0 to 9 space<br>\$ % * + - . / : |
| B    | Binary (8-bit)            | 00H to FFH                              |
| K    | Kanji                     | Shift JIS, JIS hexadecimal              |

If mixed mode is selected, up to 200 modes can be selected in a QR code.

When the automatic mode is selected in the Format Command for a QR code:

|                    |
|--------------------|
| Data to be printed |
|--------------------|

16.14.2 TRANSFER CODE

|   | 0   | 1   | 2  | 3 | 4 | 5 | 6 | 7   | 8 | 9 | A | B | C | D | E | F |
|---|-----|-----|----|---|---|---|---|-----|---|---|---|---|---|---|---|---|
| 0 | NUL | DLE | SP | 0 | @ | P | ` | p   |   |   |   |   |   |   |   |   |
| 1 | SOH | DC1 | !  | 1 | A | Q | a | q   |   |   |   |   |   |   |   |   |
| 2 | STX | DC2 | "  | 2 | B | R | b | r   |   |   |   |   |   |   |   |   |
| 3 | ETX | DC3 | #  | 3 | C | S | c | s   |   |   |   |   |   |   |   |   |
| 4 | EOT | DC4 | \$ | 4 | D | T | d | t   |   |   |   |   |   |   |   |   |
| 5 | ENQ | NAK | %  | 5 | E | U | e | u   |   |   |   |   |   |   |   |   |
| 6 | ACK | SYN | &  | 6 | F | V | f | v   |   |   |   |   |   |   |   |   |
| 7 | BEL | ETB | '  | 7 | G | W | g | w   |   |   |   |   |   |   |   |   |
| 8 | BS  | CAN | (  | 8 | H | X | h | x   |   |   |   |   |   |   |   |   |
| 9 | HT  | EM  | )  | 9 | I | Y | i | y   |   |   |   |   |   |   |   |   |
| A | LF  | SUB | *  | : | J | Z | j | z   |   |   |   |   |   |   |   |   |
| B | VT  | ESC | +  | ; | K | [ | k | {   |   |   |   |   |   |   |   |   |
| C | FF  | FS  | ,  | < | L | \ | l |     |   |   |   |   |   |   |   |   |
| D | CR  | GS  | -  | = | M | ] | m | }   |   |   |   |   |   |   |   |   |
| E | SO  | RS  | .  | > | N | ^ | n | ~   |   |   |   |   |   |   |   |   |
| F | SI  | US  | /  | ? | O | _ | o | DEL |   |   |   |   |   |   |   |   |

\* The shaded parts are Japanese.  
They are omitted here.



**16.14.3 HOW TO TRANSMIT THE CONTROL CODE DATA**

NUL (00H) = > @ (3EH, 40H)  
 SOH (01H) = > A (3EH, 41H)  
 STX (02H) = > B (3EH, 42H)  
 ⇕  
 GS (1DH) = > ] (3EH, 5DH)  
 RS (1EH) = > ^ (3EH, 5EH)  
 US (1FH) = > \_ (3EH, 5FH)

**16.14.4 HOW TO TRANSMIT THE SPECIAL CODES**

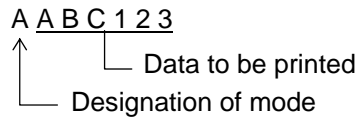
> (3EH) → > 0 (3EH, 30H)

**16.14.5 HOW TO TRANSMIT THE KANJI CODES**

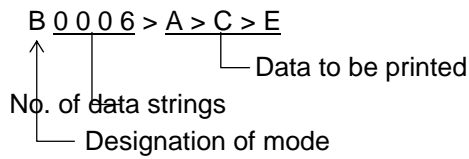
- Shift JIS
- JIS hexadecimal  
(For details, refer to the section for the Barcode Data Command.)

Examples of data designation for QR code

① Alphanumeric mode: ABC123

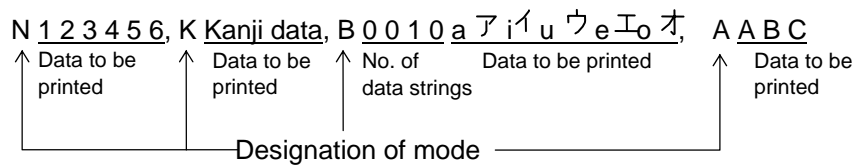


② Binary mode: 01H, 03H, 05H



③ Mixed mode

Numeric mode: 123456  
 Kanji mode: Kanji data  
 Binary mode: aアiいuうeエoオ  
 Alphanumeric mode: ABC



④ Automatic mode

When the data above (③) is designated in automatic mode:

1 2 3 4 5 6 Kanji data aアiいuうeエoオA B C  
 Data to be printed

16.15 MAXICODE

| Symbol Character Value |        | Code Set A |         | Code Set B  |         | Code Set C  |         | Code Set D  |         | Code Set E  |         |
|------------------------|--------|------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
| Decimal                | Binary | Character  | Decimal | Character   | Decimal | Character   | Decimal | Character   | Decimal | Character   | Decimal |
| 0                      | 000000 | CR         | 13      | '           | 96      | À           | 192     | à           | 224     | NUL         | 0       |
| 1                      | 000001 | A          | 65      | a           | 97      | Á           | 193     | á           | 225     | SOH         | 1       |
| 2                      | 000010 | B          | 66      | b           | 98      | Â           | 194     | â           | 226     | STX         | 2       |
| 3                      | 000011 | C          | 67      | c           | 99      | Ã           | 195     | ã           | 227     | ETX         | 3       |
| 4                      | 000100 | D          | 68      | d           | 100     | Ä           | 196     | ä           | 228     | EOT         | 4       |
| 5                      | 000101 | E          | 69      | e           | 101     | Å           | 197     | å           | 229     | ENQ         | 5       |
| 6                      | 000110 | F          | 70      | f           | 102     | Æ           | 198     | æ           | 230     | ACK         | 6       |
| 7                      | 000111 | G          | 71      | g           | 103     | Ç           | 199     | ç           | 231     | BEL         | 7       |
| 8                      | 001000 | H          | 72      | h           | 104     | È           | 200     | è           | 232     | BS          | 8       |
| 9                      | 001001 | I          | 73      | i           | 105     | É           | 201     | é           | 233     | HT          | 9       |
| 10                     | 001010 | J          | 74      | j           | 106     | Ê           | 202     | ê           | 234     | LF          | 10      |
| 11                     | 001011 | K          | 75      | k           | 107     | Ë           | 203     | ë           | 235     | VT          | 11      |
| 12                     | 001100 | L          | 76      | l           | 108     | Ì           | 204     | ì           | 236     | FF          | 12      |
| 13                     | 001101 | M          | 77      | m           | 109     | Í           | 205     | í           | 237     | CR          | 13      |
| 14                     | 001110 | N          | 78      | n           | 110     | Î           | 206     | î           | 238     | SO          | 14      |
| 15                     | 001111 | O          | 79      | o           | 111     | Ï           | 207     | ï           | 239     | SI          | 15      |
| 16                     | 010000 | P          | 80      | p           | 112     | Ð           | 208     | ð           | 240     | DLE         | 16      |
| 17                     | 010001 | Q          | 81      | q           | 113     | Ñ           | 209     | ñ           | 241     | DC1         | 17      |
| 18                     | 010010 | R          | 82      | r           | 114     | Ò           | 210     | ò           | 242     | DC2         | 18      |
| 19                     | 010011 | S          | 83      | s           | 115     | Ó           | 211     | ó           | 243     | DC3         | 19      |
| 20                     | 010100 | T          | 84      | t           | 116     | Ô           | 212     | ô           | 244     | DC4         | 20      |
| 21                     | 010101 | U          | 85      | u           | 117     | Õ           | 213     | õ           | 245     | NAK         | 21      |
| 22                     | 010110 | V          | 86      | v           | 118     | Ö           | 214     | ö           | 246     | SYN         | 22      |
| 23                     | 010111 | W          | 87      | w           | 119     | ×           | 215     | ÷           | 247     | ETB         | 23      |
| 24                     | 011000 | X          | 88      | x           | 120     | Ø           | 216     | ø           | 248     | CAN         | 24      |
| 25                     | 011001 | Y          | 89      | y           | 121     | Ù           | 217     | ù           | 249     | EM          | 25      |
| 26                     | 011010 | Z          | 90      | z           | 122     | Ú           | 218     | ú           | 250     | SUB         | 26      |
| 27                     | 011011 | [EC]       |         | [EC]        |         | [EC]        |         | [EC]        |         | [EC]        |         |
| 28                     | 011100 | FS         | 28      | FS          | 28      | FS          | 28      | FS          | 28      | [Pad]       |         |
| 29                     | 011101 | GS         | 29      | GS          | 29      | GS          | 29      | GS          | 29      | [Pad]       |         |
| 30                     | 011110 | RS         | 30      | RS          | 30      | RS          | 30      | RS          | 30      | ESC         | 27      |
| 31                     | 011111 | [NS]       |         | [NS]        |         | [NS]        |         | [NS]        |         | [NS]        |         |
| 32                     | 100000 | Space      | 32      | (           | 123     | Û           | 219     | û           | 251     | FS          | 28      |
| 33                     | 100001 | [Pad]      |         | [Pad]       |         | Ü           | 220     | ü           | 252     | GS          | 29      |
| 34                     | 100010 | "          | 34      | )           | 125     | Ý           | 221     | ý           | 253     | RS          | 30      |
| 35                     | 100011 | #          | 35      | ~           | 126     | Þ           | 222     | þ           | 254     | US          | 31      |
| 36                     | 100100 | \$         | 36      | DEL         | 127     | ß           | 223     | ÿ           | 255     | {C159}      | 159     |
| 37                     | 100101 | %          | 37      | ;           | 59      | à           | 170     | ı           | 161     | NBSP        | 160     |
| 38                     | 100110 | &          | 38      | <           | 60      | ı           | 172     | "           | 168     | ¢           | 162     |
| 39                     | 100111 | '          | 39      | =           | 61      | ±           | 177     | «           | 171     | £           | 163     |
| 40                     | 101000 | (          | 40      | >           | 62      | ²           | 178     | -           | 175     | ¤           | 164     |
| 41                     | 101001 | )          | 41      | ?           | 63      | ³           | 179     | °           | 176     | ¥           | 165     |
| 42                     | 101010 | "          | 42      | [           | 91      |             | 181     | '           | 180     |             | 166     |
| 43                     | 101011 | +          | 43      | \           | 92      | ¹           | 185     | .           | 183     | §           | 167     |
| 44                     | 101100 | ,          | 44      | ]           | 93      | º           | 186     |             | 184     | ©           | 169     |
| 45                     | 101101 | -          | 45      | ^           | 94      | ¼           | 188     | »           | 187     | SHY         | 173     |
| 46                     | 101110 | .          | 46      | _           | 95      | ½           | 189     | ¿           | 191     | ®           | 174     |
| 47                     | 101111 | /          | 47      | Space       | 32      | ¾           | 190     | {C138}      | 138     | ¶           | 182     |
| 48                     | 110000 | 0          | 48      | ,           | 44      | {C128}      | 128     | {C139}      | 139     | {C149}      | 149     |
| 49                     | 110001 | 1          | 49      | .           | 46      | {C129}      | 129     | {C140}      | 140     | {C150}      | 150     |
| 50                     | 110010 | 2          | 50      | /           | 47      | {C130}      | 130     | {C141}      | 141     | {C151}      | 151     |
| 51                     | 110011 | 3          | 51      | :           | 58      | {C131}      | 131     | {C142}      | 142     | {C152}      | 152     |
| 52                     | 110100 | 4          | 52      | @           | 64      | {C132}      | 132     | {C143}      | 143     | {C153}      | 153     |
| 53                     | 110101 | 5          | 53      | !           | 33      | {C133}      | 133     | {C144}      | 144     | {C154}      | 154     |
| 54                     | 110110 | 6          | 54      |             | 124     | {C134}      | 134     | {C145}      | 145     | {C155}      | 155     |
| 55                     | 110111 | 7          | 55      | [Pad]       |         | {C135}      | 135     | {C146}      | 146     | {C156}      | 156     |
| 56                     | 111000 | 8          | 56      | [2 Shift A] |         | {C136}      | 136     | {C147}      | 147     | {C157}      | 157     |
| 57                     | 111001 | 9          | 57      | [3 Shift A] |         | {C137}      | 137     | {C148}      | 148     | {C158}      | 158     |
| 58                     | 111010 | :          | 58      | [Pad]       |         | [Latch A]   |         | [Latch A]   |         | [Latch A]   |         |
| 59                     | 111011 | [Shift B]  |         | [Shift A]   |         | Space       | 32      | Space       | 32      | Space       | 32      |
| 60                     | 111100 | [Shift C]  |         | [Shift C]   |         | [Lock In C] |         | [Shift C]   |         | [Shift C]   |         |
| 61                     | 111101 | [Shift D]  |         | [Shift D]   |         | [Shift D]   |         | [Lock In D] |         | [Shift D]   |         |
| 62                     | 111110 | [Shift E]  |         | [Shift E]   |         | [Shift E]   |         | [Shift E]   |         | [Lock In E] |         |
| 63                     | 111111 | [Latch B]  |         | [Latch A]   |         | [Latch B]   |         | [Latch B]   |         | [Latch B]   |         |

**16.15.1 When the MaxiCode specification is set to “TYPE1: Compatible with the current version” in the system mode:**

① How to transmit the control code data

|           |   |                |
|-----------|---|----------------|
| SOH (01H) | → | > A (3EH, 41H) |
| STX (02H) | → | > B (3EH, 42H) |
| ⇕         |   |                |
| GS (1DH)  | → | > ] (3EH, 5DH) |
| RS (1EH)  | → | > ^ (3EH, 5EH) |
| US (1FH)  | → | > _ (3EH, 5FH) |

② How to transmit the special codes

|         |   |                |
|---------|---|----------------|
| > (3EH) | → | > 0 (3EH, 30H) |
|---------|---|----------------|

③ How to transmit the Kanji codes

- Shift JIS
  - JIS hexadecimal
- (For details, refer to the section for the Barcode Data Command.)

**NOTE:** “NUL” code in the table cannot be used; however, it can be designated. If it is designated, data following “NUL” code is not printed.

**16.15.2 When the MaxiCode specification is set to “TYPE2: Special specification” in the system mode:**

[Transfer Code for MaxiCode]

|   | 0             | 1   | 2  | 3 | 4 | 5 | 6 | 7   | 8 | 9 | A | B | C | D | E | F       |
|---|---------------|-----|----|---|---|---|---|-----|---|---|---|---|---|---|---|---------|
| 0 | NUL           | DLE | SP | 0 | @ | P | ` | p   |   |   |   |   |   |   |   |         |
| 1 | SOH           | DC1 | !  | 1 | A | Q | a | q   |   |   |   |   |   |   |   |         |
| 2 | STX           | DC2 | "  | 2 | B | R | b | r   |   |   |   |   |   |   |   |         |
| 3 | ETX           | DC3 | #  | 3 | C | S | c | s   |   |   |   |   |   |   |   |         |
| 4 | EOT           | DC4 | \$ | 4 | D | T | d | t   |   |   |   |   |   |   |   |         |
| 5 | ENQ           | NAK | %  | 5 | E | U | e | u   |   |   |   |   |   |   |   |         |
| 6 | ACK           | SYN | &  | 6 | F | V | f | v   |   |   |   |   |   |   |   |         |
| 7 | BEL           | ETB | '  | 7 | G | W | g | w   |   |   |   |   |   |   |   |         |
| 8 | BS            | CAN | (  | 8 | H | X | h | x   |   |   |   |   |   |   |   |         |
| 9 | HT            | EM  | )  | 9 | I | Y | i | y   |   |   |   |   |   |   |   |         |
| A | LF<br>(Note1) | SUB | *  | : | J | Z | j | z   |   |   |   |   |   |   |   |         |
| B | VT            | ESC | +  | ; | K | [ | k | {   |   |   |   |   |   |   |   |         |
| C | FF            | FS  | ,  | < | L | \ | l |     |   |   |   |   |   |   |   |         |
| D | CR            | GS  | -  | = | M | ] | m | }   |   |   |   |   |   |   |   |         |
| E | SO            | RS  | .  | > | N | ^ | n | ~   |   |   |   |   |   |   |   |         |
| F | SI            | US  | /  | ? | O | _ | o | DEL |   |   |   |   |   |   |   | (Note2) |

The all codes (00H to FFH) can be used. In the following cases, however, the codes will become special codes. For the transfer method, refer to the following:

Note 1: In case of LF (0AH) data:  
LF (0AH) → █ J (FFH, 4AH)

Note 2: In case of █ (FFH) data:  
█ (FFH) → █ █ (FFH, FFH)

ESC (1BH) and NUL (00H) can be used as they are.

### 16.16. DRAWING OF BARCODE DATA

- : Field to be incremented/decremented  
(The absence of a solid line invalidates incrementing/decrementing.)
- : Field subject to printing numerals under bars.

#### Type of Barcode: JAN8, EAN8

No affix

| No. of Input Digits |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                |                |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 8 digits            | Input Data                                                                                                                                                                                                              | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> </tr> </table> <p style="text-align: right;">└ To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                          | D <sub>2</sub>                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                              | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                          | D <sub>3</sub>                                                                                                                                                                                                                                                                              | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |                |                |
| Other than 8 digits |                                                                                                                                                                                                                         | Not to be drawn                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                |                |

Modulus 10 check

| No. of Input Digits |                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                |                |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 8 digits            | Input Data                                                                                                                                                                                                              | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> </tr> </table> <p style="text-align: right;">└ To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                          | D <sub>2</sub>                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                              | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                          | D <sub>3</sub>                                                                                                                                                                                                                                                                              | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |                |                |
| Other than 8 digits |                                                                                                                                                                                                                         | Not to be drawn                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                |                |

Auto affix of modulus 10

| No. of Input Digits |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                   |                |                |                |                |                |                |                |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 7 digits            | Input Data                                                                                                                                                                                                                                                                | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                            | D <sub>2</sub>                                                                                                                                                                                    | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">└ Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                    | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | C/D            |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                            | D <sub>3</sub>                                                                                                                                                                                    | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | C/D            |                |                |
| Other than 7 digits |                                                                                                                                                                                                                                                                           | Not to be drawn                                                                                                                                                                                   |                |                |                |                |                |                |                |

**Type of Barcode: JAN13, EAN13**

No affix

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 13 digits            | Input Data                                                                                                                                                                                                                                                                                                          | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub>  | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| D <sub>2</sub>       | D <sub>3</sub>                                                                                                                                                                                                                                                                                                      | D <sub>4</sub>                                                                                                                                                                                                                                                                                                                            | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |                 |                 |
| Other than 13 digits |                                                                                                                                                                                                                                                                                                                     | Not to be drawn                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |

Modulus 10 check

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 13 digits            | Input Data                                                                                                                                                                                                                                                                                                          | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub>  | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| D <sub>2</sub>       | D <sub>3</sub>                                                                                                                                                                                                                                                                                                      | D <sub>4</sub>                                                                                                                                                                                                                                                                                                                            | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |                 |                 |
| Other than 13 digits |                                                                                                                                                                                                                                                                                                                     | Not to be drawn                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                               | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub>  | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                           | D <sub>2</sub>                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>C/D</td> </tr> </table> | D <sub>2</sub>                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | C/D             |                 |
| D <sub>2</sub>       | D <sub>3</sub>                                                                                                                                                                                                                                                                                           | D <sub>4</sub>                                                                                                                                                                                                                                                                                                     | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | C/D             |                 |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                          | Not to be drawn                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 4 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 11 digits            | Input Data                                                                                                                                                                                                                                                                                     | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>P/CD</td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>C/D</td> </tr> </table> | D <sub>2</sub>                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | P/CD           | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | C/D             |
| D <sub>2</sub>       | D <sub>3</sub>                                                                                                                                                                                                                                                                                 | D <sub>4</sub>                                                                                                                                                                                                                                                                              | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | P/CD           | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D             |                 |                 |
| Other than 11 digits |                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 5 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 11 digits            | Input Data                                                                                                                                                                                                                                                                                     | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>P/CD</td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>C/D</td> </tr> </table> | D <sub>2</sub>                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | C/D             |
| D <sub>2</sub>       | D <sub>3</sub>                                                                                                                                                                                                                                                                                 | D <sub>4</sub>                                                                                                                                                                                                                                                                              | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D             |                 |                 |
| Other than 11 digits |                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |                 |                 |                 |                 |                 |

**Type of Barcode: UPC-A**

No affix

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                   | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                              | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |

Modulus 10 check

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                   | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                              | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 11 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                  | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                              | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                        | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                        | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | C/D             |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                              | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                        | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D             |                 |                 |
| Other than 11 digits |                                                                                                                                                                                                                                                                                                                                                                                                                             | Not to be drawn                                                                                                                                                                                                                                                                                                                                       |                |                |                |                |                |                |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 4 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                |                |                |                |                |                |                |                |                 |                |                 |     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|-----------------|-----|
| 10 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                      | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub> | D <sub>10</sub> |     |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> |                |                 |     |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>P/CD</td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">Affix price C/D 4 digits.<br/>Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub> | D <sub>10</sub> | C/D |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | C/D            |                 |     |
| Other than 10 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Not to be drawn                                                                                                                                                                                                                                                                                                                |                |                |                |                |                |                |                |                 |                |                 |     |

Auto affix of modulus 10 + Price C/D 5 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                |                |                |                |                |                |                |                |                 |                |                 |     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|-----------------|-----|
| 10 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                      | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub> | D <sub>10</sub> |     |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> |                |                 |     |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>P/CD</td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">Affix price C/D 5 digits.<br/>Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | P/CD           | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub> | D <sub>10</sub> | C/D |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>4</sub> | D <sub>5</sub> | P/CD           | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | C/D            |                 |     |
| Other than 10 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Not to be drawn                                                                                                                                                                                                                                                                                                                |                |                |                |                |                |                |                |                 |                |                 |     |

**Type of Barcode: UPC-E**

No affix

| No. of Input Digits |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 7 digits            | Input Data                                                                                                                                                                                                                                                         | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td> </tr> </table><br><span style="margin-left: 150px;">└─ To be checked as modulus 10 C/D</span> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                       | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |                |                |
| Other than 7 digits |                                                                                                                                                                                                                                                                    | Not to be drawn                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |

Modulus 10 check

| No. of Input Digits |                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 7 digits            | Input Data                                                                                                                                                                                                                                                         | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td> </tr> </table><br><span style="margin-left: 150px;">└─ To be checked as modulus 10 C/D</span> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                       | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> |                |                |
| Other than 7 digits |                                                                                                                                                                                                                                                                    | Not to be drawn                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |

Auto affix of modulus 10

| No. of Input Digits |                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |     |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|
| 6 digits            | Input Data                                                                                                                                                                                                                                               | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td> </tr> </table> <span style="margin-left: 20px;">Calculate and reflect modulus 10 in the barcode.</span> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> |     |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                           | D <sub>2</sub>                                                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> |                |                |     |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>C/D</td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                           | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | C/D |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                           | D <sub>2</sub>                                                                                                                                                                                                                                                                                                              | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | C/D            |                |     |
| Other than 6 digits |                                                                                                                                                                                                                                                          | Not to be drawn                                                                                                                                                                                                                                                                                                             |                |                |                |                |                |                |     |



**Type of Barcode: JAN8 + 2 digits, EAN8 + 2 digits**

No affix

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |
| 10 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                    | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td> </tr> </table><br><div style="text-align: right; margin-right: 100px;">└─ To be checked as modulus 10 C/D</div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>9</sub></td><td style="border: 1px solid black; padding: 2px;">D<sub>10</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> |                 |                 |                 |
| Other than 10 digits |                                                                                                                                                                                                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |

Modulus 10 check

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |
| 10 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                    | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td> </tr> </table><br><div style="text-align: right; margin-right: 100px;">└─ To be checked as modulus 10 C/D</div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>9</sub></td><td style="border: 1px solid black; padding: 2px;">D<sub>10</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> |                 |                 |                 |
| Other than 10 digits |                                                                                                                                                                                                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |

Auto affix of modulus 10

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |                |                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |                |                |
| 9 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td style="border: 1px solid black; padding: 2px;">C/D</td> <td style="border: 1px solid black; padding: 2px;">D<sub>8</sub></td><td style="border: 1px solid black; padding: 2px;">D<sub>9</sub></td> </tr> </table><br><div style="text-align: right; margin-right: 100px;">└─ Affix a modulus 10 C/D.</div> | D <sub>1</sub>                                                                                                                                                                                                                                                                                          | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | C/D            | D <sub>8</sub> | D <sub>9</sub> |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D <sub>3</sub>                                                                                                                                                                                                                                                                                          | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | C/D            | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Other than 9 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |                |                |

**Type of Barcode: JAN8 + 5 digits, EAN8 + 5 digits**

No affix

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 13 digits            | Input Data                                                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> <p style="text-align: center;">└─ To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> <td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                             | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |                 |
| Other than 13 digits |                                                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |

Modulus 10 check

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 13 digits            | Input Data                                                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> <p style="text-align: center;">└─ To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> <td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                             | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |                 |
| Other than 13 digits |                                                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                    | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Drawing Data         | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>C/D</td> <td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> <p style="text-align: center;">└─ Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | C/D            | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                     | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | C/D            | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |

**Type of Barcode: JAN13 + 2 digits, EAN13 + 2 digits**

No affix

| No. of Input Digits  |              |                                                                                                                                                                                                                                        |
|----------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> |
|                      | Drawing Data | D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub>                |
| Other than 15 digits |              | Not to be drawn                                                                                                                                                                                                                        |

Modulus 10 check

| No. of Input Digits  |              |                                                                                                                                                                                                                                        |
|----------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 15 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> |
|                      | Drawing Data | D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub>                |
| Other than 15 digits |              | Not to be drawn                                                                                                                                                                                                                        |

Auto affix of modulus 10

| No. of Input Digits  |              |                                                                                                                                                                                                                        |
|----------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 14 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> |
|                      | Drawing Data | D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> C/D D <sub>13</sub> D <sub>14</sub>            |
| Other than 14 digits |              | Not to be drawn                                                                                                                                                                                                        |

Auto affix of modulus 10 + Price C/D 4 digits

| No. of Input Digits  |              |                                                                                                                                                                                                        |
|----------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> |
|                      | Drawing Data | D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> P/CD D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> C/D D <sub>12</sub> D <sub>13</sub>       |
| Other than 13 digits |              | Not to be drawn                                                                                                                                                                                        |

Auto affix of modulus 10 + Price C/D 5 digits

| No. of Input Digits  |              |                                                                                                                                                                                                        |
|----------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> |
|                      | Drawing Data | D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> P/CD D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> C/D D <sub>12</sub> D <sub>13</sub>       |
| Other than 13 digits |              | Not to be drawn                                                                                                                                                                                        |

**Type of Barcode: JAN13 + 5 digits, EAN13 + 5 digits**

No affix

| No. of Input Digits  |              |                                                                                                                                                                                                                                                                                        |
|----------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> D <sub>16</sub> D <sub>17</sub> D <sub>18</sub> |
|                      | Drawing Data |                                                                                                                                                                                                                                                                                        |
| Other than 18 digits |              | Not to be drawn                                                                                                                                                                                                                                                                        |

Modulus 10 check

| No. of Input Digits  |              |                                                                                                                                                                                                                                                                                        |
|----------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 18 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> D <sub>16</sub> D <sub>17</sub> D <sub>18</sub> |
|                      | Drawing Data |                                                                                                                                                                                                                                                                                        |
| Other than 18 digits |              | Not to be drawn                                                                                                                                                                                                                                                                        |

Auto affix of modulus 10

| No. of Input Digits  |              |                                                                                                                                                                                                                                                                        |
|----------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 17 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> D <sub>16</sub> D <sub>17</sub> |
|                      | Drawing Data |                                                                                                                                                                                                                                                                        |
| Other than 17 digits |              | Not to be drawn                                                                                                                                                                                                                                                        |

Auto affix of modulus 10 + Price C/D 4 digits

| No. of Input Digits  |              |                                                                                                                                                                                                                                                        |
|----------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> D <sub>16</sub> |
|                      | Drawing Data |                                                                                                                                                                                                                                                        |
| Other than 16 digits |              | Not to be drawn                                                                                                                                                                                                                                        |

Auto affix of modulus 10 + Price C/D 5 digits

| No. of Input Digits  |              |                                                                                                                                                                                                                                                        |
|----------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> D <sub>14</sub> D <sub>15</sub> D <sub>16</sub> |
|                      | Drawing Data |                                                                                                                                                                                                                                                        |
| Other than 16 digits |              | Not to be drawn                                                                                                                                                                                                                                        |

**Type of Barcode: UPC-A + 2 digits**

No affix

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 14 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>13</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>14</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |                 |                 |                 |
| Other than 14 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |

Modulus 10 check

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 14 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>13</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>14</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> |                 |                 |                 |
| Other than 14 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 13 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>C/D</td> <td style="border: 1px solid black; padding: 2px;">D<sub>12</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>13</sub></td> </tr> </table> <p style="text-align: right;">Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | C/D             | D <sub>12</sub> | D <sub>13</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D             | D <sub>12</sub> | D <sub>13</sub> |                 |                 |
| Other than 13 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 4 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>P/CD</td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>C/D</td> <td style="border: 1px solid black; padding: 2px;">D<sub>11</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>12</sub></td> </tr> </table> <p style="text-align: right;">Affix price C/D 4 digits.<br/>Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 5 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>P/CD</td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>C/D</td> <td style="border: 1px solid black; padding: 2px;">D<sub>11</sub></td> <td style="border: 1px solid black; padding: 2px;">D<sub>12</sub></td> </tr> </table> <p style="text-align: right;">Affix price C/D 5 digits.<br/>Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | P/CD           | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                               | D <sub>4</sub> | D <sub>5</sub> | P/CD           | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |

**Type of Barcode: UPC-A + 5 digits**

No affix

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
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| 17 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |                 |                 |
| Drawing Data         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> <td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |                 |                 |                 |
| Other than 17 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |

Modulus 10 check

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 17 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |                 |                 |
| Drawing Data         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> <td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |                 |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> |                 |                 |                 |
| Other than 17 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 16 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> |                 |                 |
| Drawing Data         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>C/D</td> <td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td> </tr> </table> <p style="text-align: right;">Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                          | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | C/D             | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                          | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D             | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> |                 |                 |
| Other than 16 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 4 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 15 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |                 |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |                 |                 |                 |
| Drawing Data         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>P/CD</td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>C/D</td> <td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td> </tr> </table> <p style="text-align: right;">Affix price C/D 4 digits.<br/>Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | P/CD           | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |                 |                 |
| Other than 15 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |

Auto affix of modulus 10 + Price C/D 5 digits

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 15 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |                 |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |                 |                 |                 |
| Drawing Data         | <table border="1" style="width: 100%; text-align: center;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>P/CD</td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>C/D</td> <td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td> </tr> </table> <p style="text-align: right;">Affix price C/D 5 digits.<br/>Affix a modulus 10 C/D.</p> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | P/CD           | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |
| D <sub>1</sub>       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>4</sub> | D <sub>5</sub> | P/CD           | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | C/D             | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> |                 |                 |
| Other than 15 digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |

**Type of Barcode: UPC-E + 2 digits**

No affix

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                |                |                |                |                |                |                |                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 9 digits            | Input Data                                                                                                                                                                                                                                                                                                     | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table><br><div style="text-align: right; margin-left: 150px;">           └─ To be checked as modulus 10 C/D         </div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                           | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                                                        | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                           | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Other than 9 digits |                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                          |                |                |                |                |                |                |                |                |                |

Modulus 10 check

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                          |                |                |                |                |                |                |                |                |                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 9 digits            | Input Data                                                                                                                                                                                                                                                                                                     | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table><br><div style="text-align: right; margin-left: 150px;">           └─ To be checked as modulus 10 C/D         </div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                           | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                                                        | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                           | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Other than 9 digits |                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                          |                |                |                |                |                |                |                |                |                |

Auto affix of modulus 10

| No. of Input Digits |                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                        |                |                |                |                |                |                |                |                |                |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| 8 digits            | Input Data                                                                                                                                                                                                                                                                                           | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> </tr> </table><br>Calculate and reflect modulus 10 C/D in the barcode. | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                         | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> |                |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>C/D</td><td>D<sub>7</sub></td><td>D<sub>8</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                      | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | C/D            | D <sub>7</sub> | D <sub>8</sub> |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                                                                       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                         | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | C/D            | D <sub>7</sub> | D <sub>8</sub> |                |                |
| Other than 8 digits |                                                                                                                                                                                                                                                                                                      | Not to be drawn                                                                                                                                                                                                                                                                                                                        |                |                |                |                |                |                |                |                |                |

**Type of Barcode: UPC-E + 5 digits**

No affix

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                             | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table><br><div style="text-align: right; margin-right: 100px;">└ To be checked as modulus 10 C/D</div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                         | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
| 0                    | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                         | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                                        | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |

Modulus 10 check

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                             | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table><br><div style="text-align: right; margin-right: 100px;">└ To be checked as modulus 10 C/D</div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                         | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |
| 0                    | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                         | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |
| Other than 12 digits |                                                                                                                                                                                                                                                                                                                                                                                        | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |

Auto affix of modulus 10

| No. of Input Digits  |                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 11 digits            | Input Data                                                                                                                                                                                                                                                                                                                                                                  | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td> </tr> </table><br><div style="text-align: right; margin-right: 20px;">Calculate and reflect modulus 10 C/D in the barcode.</div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |                 |
|                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                              | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> |                 |                 |                 |
| Drawing Data         | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>C/D</td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | C/D            | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |
| 0                    | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                              | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | C/D            | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> |                 |                 |
| Other than 11 digits |                                                                                                                                                                                                                                                                                                                                                                             | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |



**Type of Barcode: MSI**

No affix

| No. of Input Digits |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Max. 15 digits      | Input Data                                                                                                                                                                                                                                    | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> <p style="text-align: right;">└ Not recognized as a check digit.</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                     | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |                |
| 16 digits or more   |                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |

**IBM modulus 10 check**

| No. of Input Digits                                |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                          |                |                |                |                |                |                |                 |                 |                 |                 |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| Min. 2 digits<br>Max. 15 digits<br>(including C/D) | Input Data                                                                                                                                                                                                                                                           | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td> </tr> </table> <p style="text-align: right;">└ To be checked as IBM modulus 10</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> |
|                                                    | D <sub>1</sub>                                                                                                                                                                                                                                                       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                           | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> |                 |                 |
| Drawing Data                                       | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                           | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> |                 |
| D <sub>1</sub>                                     | D <sub>2</sub>                                                                                                                                                                                                                                                       | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                           | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> |                 |                 |                 |
| 1 digit<br>16 digits or more                       |                                                                                                                                                                                                                                                                      | Not to be drawn                                                                                                                                                                                                                                                                                                                          |                |                |                |                |                |                |                 |                 |                 |                 |

**Auto affix of IBM modulus 10**

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Max. 14 digits      | Input Data                                                                                                                                                                                                                                                                                                          | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">└ Affix IBM modulus 10.</p> | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                      | D <sub>3</sub>                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            |                |                |
| 15 digits or more   |                                                                                                                                                                                                                                                                                                                     | Not to be drawn                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |

**IBM modulus 10 + Auto affix of IBM modulus 10**

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                  |                  |                  |                  |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|
| Max. 13 digits      | Input Data                                                                                                                                                                                                                                                                                                                                                                          | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>   | D <sub>8</sub>   | D <sub>9</sub>   |                  |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>   |                  |                  |                  |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D<sub>1</sub></td><td>C/D<sub>2</sub></td> </tr> </table> <p style="text-align: right;">└ Affix IBM modulus 10.<br/>└ Affix IBM modulus 10.</p> | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>   | D <sub>9</sub>   | C/D <sub>1</sub> | C/D <sub>2</sub> |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub>                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D <sub>1</sub> | C/D <sub>2</sub> |                  |                  |
| 14 digits or more   |                                                                                                                                                                                                                                                                                                                                                                                     | Not to be drawn                                                                                                                                                                                                                               |                |                |                |                |                |                |                  |                  |                  |                  |

**IBM modulus 11 + Auto affix of IBM modulus 10**

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                  |                  |                  |                  |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|
| Max. 13 digits      | Input Data                                                                                                                                                                                                                                                                                                                                                                          | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>   | D <sub>8</sub>   | D <sub>9</sub>   |                  |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>   |                  |                  |                  |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D<sub>1</sub></td><td>C/D<sub>2</sub></td> </tr> </table> <p style="text-align: right;">└ Affix IBM modulus 10.<br/>└ Affix IBM modulus 11.</p> | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>   | D <sub>9</sub>   | C/D <sub>1</sub> | C/D <sub>2</sub> |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub>                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D <sub>1</sub> | C/D <sub>2</sub> |                  |                  |
| 14 digits or more   |                                                                                                                                                                                                                                                                                                                                                                                     | Not to be drawn                                                                                                                                                                                                                               |                |                |                |                |                |                |                  |                  |                  |                  |

**Type of Barcode: Interleaved 2 of 5**

No affix

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Max. 126 digits     | Input Data                                                                                                                                                                                                                                                                                                     | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table><br><span style="margin-left: 150px;">└─ Not recognized as a check digit.</span> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                       | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                    | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
| 0                   | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                       | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| 127 digits or more  |                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |

Modulus 10 check

| No. of Input Digits                                 |                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |
|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Min. 2 digits<br>Max. 126 digits<br>(including C/D) | Input Data                                                                                                                                                                                                                                                                                                     | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table><br><span style="margin-left: 150px;">└─ To be checked as modulus 10 C/D</span> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                                                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data                                        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | 0                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
| 0                                                   | D <sub>1</sub>                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| 1 digit<br>127 digits or more                       |                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |

Auto affix of modulus 10

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Max. 125 digits     | Input Data                                                                                                                                                                                                                                                                                                                                                                              | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                          | D <sub>2</sub>                                                                                                                                                                                                                                                                                       | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>6</sub></td><td>D<sub>9</sub></td><td>C/D</td> </tr> </table><br><span style="margin-left: 150px;">└─ Affix a modulus 10 C/D.</span> | D <sub>1</sub>                                                                                                                                                                                                                                                                                       | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>6</sub> | D <sub>9</sub> | C/D            |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                          | D <sub>3</sub>                                                                                                                                                                                                                                                                                       | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>6</sub> | D <sub>9</sub> | C/D            |                |                |
| 126 digits or more  |                                                                                                                                                                                                                                                                                                                                                                                         | Not to be drawn                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |

Auto affix of DBP modulus 10

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Max. 125 digits     | Input Data                                                                                                                                                                                                                                                                                                                                                                                  | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                              | D <sub>2</sub>                                                                                                                                                                                                                                                                                       | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>6</sub></td><td>D<sub>9</sub></td><td>C/D</td> </tr> </table><br><span style="margin-left: 150px;">└─ Affix a DBP modulus 10 C/D.</span> | D <sub>1</sub>                                                                                                                                                                                                                                                                                       | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>6</sub> | D <sub>9</sub> | C/D            |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                              | D <sub>3</sub>                                                                                                                                                                                                                                                                                       | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>6</sub> | D <sub>9</sub> | C/D            |                |                |
| 126 digits or more  |                                                                                                                                                                                                                                                                                                                                                                                             | Not to be drawn                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |

**Type of Barcode: Industrial 2 of 5**

No affix

|                     |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |
| Max. 126 digits     | Input Data                                                                                                                                                                                                                                    | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> <p style="text-align: right;">└ Not recognized as a check digit.</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                     | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |                |
| 127 digits or more  |                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |

Modulus check character check

|                                                     |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                |                |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits                                 |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                |                |
| Min. 2 digits<br>Max. 126 digits<br>(including C/D) | Input Data                                                                                                                                                                                                                                    | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> <p style="text-align: right;">└ To be checked as a modulus check character</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                                                     | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data                                        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                               | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |
| D <sub>1</sub>                                      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                               | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |                |
| 1 digit<br>127 digits or more                       |                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                |                |

Auto affix of modulus check character

|                     |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |
| Max. 125 digits     | Input Data                                                                                                                                                                                                                                                                                                                     | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">└ Affix a modulus check character.</p> | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>3</sub>                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            |                |                |
| 126 digits or more  |                                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |

**Type of Barcode: CODE39 (Standard)**

No affix

| No. of Input Digits              |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|------------|--|--|--|--|--|--|--|--|--|-----------|----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Max. 123 digits                  | Input Data                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> <tr> <td colspan="11">Not recognized as a check digit.</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP    | Start code |  |  |  |  |  |  |  |  |  | Stop code | Not recognized as a check digit. |  |  |  |  |  |  |  |  |  |  |
|                                  | ST                                                                                                                                                                                                                                                                                                         | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| Start code                       |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                | Stop code      |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| Not recognized as a check digit. |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| Drawing Data                     | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             | _____ |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| ST                               | D <sub>1</sub>                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| _____                            |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| 124 digits or more               |                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |

Modulus 43 check

| No. of Input Digits                                 |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|------------|--|--|--|--|--|--|--|--|--|-----------|---------------------------------|--|--|--|--|--|--|--|--|--|--|
| Min. 2 digits<br>Max. 123 digits<br>(including C/D) | Input Data                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> <tr> <td colspan="11">To be checked as modulus 43 C/D</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP    | Start code |  |  |  |  |  |  |  |  |  | Stop code | To be checked as modulus 43 C/D |  |  |  |  |  |  |  |  |  |  |
|                                                     | ST                                                                                                                                                                                                                                                                                                         | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| Start code                                          |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                | Stop code      |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| To be checked as modulus 43 C/D                     |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| Drawing Data                                        | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             | _____ |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| ST                                                  | D <sub>1</sub>                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| _____                                               |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| 1 digit<br>124 digits or more                       |                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |

Auto affix of modulus 43

| No. of Input Digits     |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----|------------|--|--|--|--|--|--|--|--|--|-----------|-------------------------|--|--|--|--|--|--|--|--|--|--|--|
| Max. 122 digits         | Input Data                                                                                                                                                                                                                                                                                                                                                                      | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP | Start code |  |  |  |  |  |  |  |  |  | Stop code |                         |  |  |  |  |  |  |  |  |  |  |  |
|                         | ST                                                                                                                                                                                                                                                                                                                                                                              | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |
| Start code              |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                | Stop code      |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |
| Drawing Data            | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D</td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> <tr> <td colspan="11">Affix a modulus 43 C/D.</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                 | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            | SP | _____      |  |  |  |  |  |  |  |  |  |           | Affix a modulus 43 C/D. |  |  |  |  |  |  |  |  |  |  |  |
| ST                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            | SP             |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |
| _____                   |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |
| Affix a modulus 43 C/D. |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |
| 123 digits or more      |                                                                                                                                                                                                                                                                                                                                                                                 | Not to be drawn                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |  |

**Type of Barcode: CODE39 (Full ASCII)**

No affix

| No. of Input Digits              |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|------------|--|--|--|--|--|--|--|--|--|-----------|----------------------------------|--|--|--|--|--|--|--|--|--|--|
| Max. 60 digits                   | Input Data                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> <tr> <td colspan="11">Not recognized as a check digit.</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP    | Start code |  |  |  |  |  |  |  |  |  | Stop code | Not recognized as a check digit. |  |  |  |  |  |  |  |  |  |  |
|                                  | ST                                                                                                                                                                                                                                                                                                         | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| Start code                       |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                | Stop code      |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| Not recognized as a check digit. |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| Drawing Data                     | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             | _____ |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| ST                               | D <sub>1</sub>                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| _____                            |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |
| 61 digits or more                |                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                      |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                  |  |  |  |  |  |  |  |  |  |  |

Modulus 43 check

| No. of Input Digits                                |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|------------|--|--|--|--|--|--|--|--|--|-----------|---------------------------------|--|--|--|--|--|--|--|--|--|--|
| Min. 2 digits<br>Max. 60 digits<br>(including C/D) | Input Data                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> <tr> <td colspan="11">To be checked as modulus 43 C/D</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP    | Start code |  |  |  |  |  |  |  |  |  | Stop code | To be checked as modulus 43 C/D |  |  |  |  |  |  |  |  |  |  |
|                                                    | ST                                                                                                                                                                                                                                                                                                         | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| Start code                                         |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                | Stop code      |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| To be checked as modulus 43 C/D                    |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| Drawing Data                                       | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             | _____ |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| ST                                                 | D <sub>1</sub>                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                      | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| _____                                              |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |
| 1 digit<br>61 digits or more                       |                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                     |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |                                 |  |  |  |  |  |  |  |  |  |  |

Auto affix of modulus 43

| No. of Input Digits     |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----|------------|--|--|--|--|--|--|--|--|--|-----------|-------------------------|--|--|--|--|--|--|--|--|--|--|
| Max. 60 digits          | Input Data                                                                                                                                                                                                                                                                                                                                                                      | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP | Start code |  |  |  |  |  |  |  |  |  | Stop code |                         |  |  |  |  |  |  |  |  |  |  |
|                         | ST                                                                                                                                                                                                                                                                                                                                                                              | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |
| Start code              |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                | Stop code      |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |
| Drawing Data            | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D</td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> <tr> <td colspan="11">Affix a modulus 43 C/D.</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                 | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            | SP | _____      |  |  |  |  |  |  |  |  |  |           | Affix a modulus 43 C/D. |  |  |  |  |  |  |  |  |  |  |
| ST                      | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            | SP             |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |
| _____                   |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |
| Affix a modulus 43 C/D. |                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |
| 61 digits or more       |                                                                                                                                                                                                                                                                                                                                                                                 | Not to be drawn                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |    |            |  |  |  |  |  |  |  |  |  |           |                         |  |  |  |  |  |  |  |  |  |  |

**NOTE:** Numerals under bars are not characters corresponding to the bars but the characters of the codes received are drawn.

**Type of Barcode: NW7**

No affix, C/D check, Auto affix

| No. of Input Digits |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|------------|--|--|--|--|--|--|--|--|--|-----------|
| Max. 125 digits     | Input Data                                                                                                                                                                                                                                                                                                 | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> </table> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP    | Start code |  |  |  |  |  |  |  |  |  | Stop code |
|                     | ST                                                                                                                                                                                                                                                                                                         | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |       |            |  |  |  |  |  |  |  |  |  |           |
| Start code          |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                | Stop code      |                |                |       |            |  |  |  |  |  |  |  |  |  |           |
| Drawing Data        | <table border="1"> <tr> <td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>SP</td> </tr> <tr> <td colspan="11">_____</td> </tr> </table> | ST                                                                                                                                                                                                                                                                                                                                 | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             | _____ |            |  |  |  |  |  |  |  |  |  |           |
| ST                  | D <sub>1</sub>                                                                                                                                                                                                                                                                                             | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | SP             |                |                |       |            |  |  |  |  |  |  |  |  |  |           |
| _____               |                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |
| 126 digits or more  |                                                                                                                                                                                                                                                                                                            | Not to be drawn                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |       |            |  |  |  |  |  |  |  |  |  |           |

**Type of Barcode: No auto selection of CODE128 (Character “>” to be also counted as a digit)**

No affix, PSEUDO103 check, Auto affix of PSEUDO103

|                                                            |              |                                                                                                                                                                                                          |
|------------------------------------------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. of Input Digits                                        |              |                                                                                                                                                                                                          |
| Min. 3 digits<br>Max. 125 digits<br>(including start code) | Input Data   | ST D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub>                                |
|                                                            | Drawing Data | ST D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> C/D SP<br>Affix PSEUDO103 C/D. |
| 2 digits or less<br>126 digits or more                     |              | Not to be drawn                                                                                                                                                                                          |

**NOTE:** The following characters are not drawn as numerals under bars.  
NUL (00H) to US (1FH), FNC1, FNC2, FNC3, SHIFT, CODE A, CODE B, CODE C

**Type of Barcode: Auto selection of CODE128**

No affix, C/D check, Auto affix of C/D

|                     |              |                                                                                                                                                                                                                                                       |
|---------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. of Input Digits |              |                                                                                                                                                                                                                                                       |
| Max. 60 digits      | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub>                                                                                |
|                     | Drawing Data | ST D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> AD D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> AD D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> C/D SP<br>Start code Selection code Stop code<br>Affix PSEUDO103 C/D. |
| 61 digits or more   |              | Not to be drawn                                                                                                                                                                                                                                       |

**NOTE:** The following characters are not drawn as numerals under bars.  
NUL (00H) to US (1FH), FNC1, FNC2, FNC3, SHIFT, CODE A, CODE B, CODE C

**Type of Barcode: CODE93**

No affix, C/D check, Auto affix of C/D

|                     |              |                                                                                                                                                                                                                                                                      |
|---------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No. of Input Digits |              |                                                                                                                                                                                                                                                                      |
| Max. 60 digits      | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub>                                                                                                                               |
|                     | Drawing Data | ST D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> C/D <sub>1</sub> C/D <sub>2</sub> SP<br>Start code Stop code<br>Affix a modulus 47 “K” C/D.<br>Affix a modulus 47 “C” C/D. |
| 61 digits or more   |              | Not to be drawn                                                                                                                                                                                                                                                      |

**NOTE:** Numerals under bars are not characters corresponding to the bars but the characters of the codes received are drawn.

**Type of Barcode: UCC/EAN128**

No affix, C/D check, Auto affix of C/D

| No. of Input Digits  |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                  |                  |                 |                  |                  |
|----------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|-----------------|------------------|------------------|
| 19 digits            | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> ... D <sub>14</sub> D <sub>15</sub> D <sub>16</sub> D <sub>17</sub> D <sub>18</sub> D <sub>19</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                  |                  |                 |                  |                  |
|                      | Drawing Data | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px;">ST</td> <td style="width: 20px;">FNC1</td> <td style="width: 20px;">D<sub>1</sub></td> <td style="width: 20px;">D<sub>2</sub></td> <td style="width: 20px;">D<sub>3</sub></td> <td style="width: 20px;">D<sub>4</sub></td> <td style="width: 20px;">D<sub>5</sub></td> <td style="width: 20px;">D<sub>6</sub></td> <td style="width: 20px;">...</td> <td style="width: 20px;">D<sub>14</sub></td> <td style="width: 20px;">D<sub>15</sub></td> <td style="width: 20px;">D<sub>16</sub></td> <td style="width: 20px;">D<sub>17</sub></td> <td style="width: 20px;">D<sub>18</sub></td> <td style="width: 20px;">D<sub>19</sub></td> <td style="width: 20px;">C/D<sub>1</sub></td> <td style="width: 20px;">C/D<sub>2</sub></td> <td style="width: 20px;">SP</td> </tr> </table> <p style="margin-left: 40px;">Start code</p> <p style="margin-left: 600px;">Affix a modulus 10 C/D.</p> <p style="margin-left: 600px;">Affix a modulus 11 C/D.</p> <p style="margin-left: 800px;">Stop code</p> | ST             | FNC1           | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub>  | D <sub>6</sub>  | ...             | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub>  | D <sub>18</sub>  | D <sub>19</sub> | C/D <sub>1</sub> | C/D <sub>2</sub> |
| ST                   | FNC1         | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | ...            | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | C/D <sub>1</sub> | C/D <sub>2</sub> | SP              |                  |                  |
| Other than 19 digits |              | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                  |                  |                 |                  |                  |

**Type of Barcode: POSTNET**

Auto affix of dedicated C/D

| No. of Input Digits           |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                |                |                |                |                |                 |                 |                |                 |                 |     |
|-------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----|
| 5 digits                      | Input Data     | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                |                |                |                |                |                |                |                |                |                |                 |                 |                |                 |                 |     |
|                               | Drawing Data   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px;">ST</td> <td style="width: 20px;">D<sub>1</sub></td> <td style="width: 20px;">D<sub>2</sub></td> <td style="width: 20px;">D<sub>3</sub></td> <td style="width: 20px;">D<sub>4</sub></td> <td style="width: 20px;">D<sub>5</sub></td> <td style="width: 20px;">C/D</td> <td style="width: 20px;">SP</td> </tr> </table> <p style="margin-left: 40px;">Start code</p> <p style="margin-left: 550px;">Stop code</p> <p style="margin-left: 550px;">Dedicated check digit</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | C/D            | SP             |                |                |                 |                 |                |                 |                 |     |
| ST                            | D <sub>1</sub> | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | C/D            | SP             |                |                |                |                |                |                 |                 |                |                 |                 |     |
| 9 digits                      | Input Data     | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |                 |                 |                |                 |                 |     |
|                               | Drawing Data   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px;">ST</td> <td style="width: 20px;">D<sub>1</sub></td> <td style="width: 20px;">D<sub>2</sub></td> <td style="width: 20px;">D<sub>3</sub></td> <td style="width: 20px;">D<sub>4</sub></td> <td style="width: 20px;">D<sub>5</sub></td> <td style="width: 20px;">D<sub>6</sub></td> <td style="width: 20px;">D<sub>7</sub></td> <td style="width: 20px;">D<sub>8</sub></td> <td style="width: 20px;">D<sub>9</sub></td> <td style="width: 20px;">C/D</td> <td style="width: 20px;">SP</td> </tr> </table> <p style="margin-left: 40px;">Start code</p> <p style="margin-left: 650px;">Stop code</p> <p style="margin-left: 650px;">Dedicated check digit</p>                                                                                                                                                                                                                                                                                 | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D             | SP              |                |                 |                 |     |
| ST                            | D <sub>1</sub> | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            | SP             |                |                 |                 |                |                 |                 |     |
| 11 digits                     | Input Data     | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |                |                 |                 |                |                 |                 |     |
|                               | Drawing Data   | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px;">ST</td> <td style="width: 20px;">D<sub>1</sub></td> <td style="width: 20px;">D<sub>2</sub></td> <td style="width: 20px;">D<sub>3</sub></td> <td style="width: 20px;">D<sub>4</sub></td> <td style="width: 20px;">D<sub>5</sub></td> <td style="width: 20px;">C/D</td> <td style="width: 20px;">SP</td> <td style="width: 20px;">FR</td> <td style="width: 20px;">D<sub>6</sub></td> <td style="width: 20px;">D<sub>7</sub></td> <td style="width: 20px;">D<sub>8</sub></td> <td style="width: 20px;">D<sub>9</sub></td> <td style="width: 20px;">D<sub>10</sub></td> <td style="width: 20px;">D<sub>11</sub></td> <td style="width: 20px;">C/D</td> <td style="width: 20px;">FR</td> </tr> </table> <p style="margin-left: 40px;">Start code</p> <p style="margin-left: 550px;">Frame</p> <p style="margin-left: 550px;">Stop code</p> <p style="margin-left: 550px;">Dedicated check digit</p> <p style="margin-left: 850px;">Frame</p> | ST             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | C/D            | SP             | FR             | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D |
| ST                            | D <sub>1</sub> | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | C/D            | SP             | FR             | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | C/D            | FR              |                 |     |
| Other than 5, 9 and 11 digits |                | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                |                |                |                |                |                 |                 |                |                 |                 |     |

**Type of Barcode: RM4SCC**

Auto affix of dedicated C/D

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |     |    |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|----|
| 12 digits           | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | (ST) <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td></tr></table> (SP)<br><div style="display: flex; justify-content: space-between; width: 100%;"><span>Start code</span><span>Stop code</span></div> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |     |    |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> |                 |                 |     |    |
| Drawing Data        | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>C/D</td><td>SP</td></tr></table><br><div style="display: flex; justify-content: space-between; width: 100%;"><span>Start code</span><span>Dedicated check digit</span><span>Stop code</span></div> | ST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | C/D | SP |
| ST                  | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | C/D             | SP              |     |    |
| 13 digits or more   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |     |    |

**Type of Barcode: KIX CODE**

No affix

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 18 digits           | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td><td>D<sub>18</sub></td></tr></table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub>  | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> |                 |                 |
| Drawing Data        | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td><td>D<sub>18</sub></td></tr></table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> |                 |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>3</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> |                 |                 |                 |
| 19 digits or more   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Not to be drawn                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |

**Type of Barcode: Customer barcode**

Auto affix of dedicated C/D

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|----|
| 20 digits           | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td><td>D<sub>18</sub></td><td>D<sub>19</sub></td><td>D<sub>20</sub></td></tr></table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | D <sub>20</sub> |     |    |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | D <sub>20</sub> |                 |                 |     |    |
| Drawing Data        | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td><td>D<sub>18</sub></td><td>D<sub>19</sub></td><td>D<sub>20</sub></td><td>C/D</td><td>SP</td></tr></table><br><div style="display: flex; justify-content: space-between; width: 100%;"><span>Start code</span><span>Dedicated check digit</span><span>Stop code</span></div> | ST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | D <sub>20</sub> | C/D | SP |
| ST                  | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | D <sub>20</sub> | C/D             | SP              |     |    |
| 21 digits or more   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Data of up to 20 digits is drawn. Data of 21 digits or more is discarded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |    |

**Type of Barcode: Highest priority customer barcode**

Auto affix of dedicated C/D

| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |     |    |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----|-----|----|
| 19 digits           | Input Data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td><td>D<sub>18</sub></td><td>D<sub>19</sub></td></tr></table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> |     |     |    |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> |                 |                 |     |     |    |
| Drawing Data        | <table border="1" style="display: inline-table; border-collapse: collapse;"><tr><td>ST</td><td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>D<sub>10</sub></td><td>D<sub>11</sub></td><td>D<sub>12</sub></td><td>D<sub>13</sub></td><td>D<sub>14</sub></td><td>D<sub>15</sub></td><td>D<sub>16</sub></td><td>D<sub>17</sub></td><td>D<sub>18</sub></td><td>D<sub>19</sub></td><td>CC7</td><td>C/D</td><td>SP</td></tr></table><br><div style="display: flex; justify-content: space-between; width: 100%;"><span>Start code</span><span>CC7</span><span>Dedicated check digit</span><span>Stop code</span></div> | ST                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub>  | D <sub>9</sub>  | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | CC7 | C/D | SP |
| ST                  | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | D <sub>10</sub> | D <sub>11</sub> | D <sub>12</sub> | D <sub>13</sub> | D <sub>14</sub> | D <sub>15</sub> | D <sub>16</sub> | D <sub>17</sub> | D <sub>18</sub> | D <sub>19</sub> | CC7             | C/D             | SP  |     |    |
| 20 digits or more   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Data of up to 19 digits is drawn. Data of 20 digits or more is discarded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                |                |                |                |                |                |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |     |     |    |



**Type of Barcode: RSS-14, RSS-14 Stacked, RSS-14 Stacked Omni-directional, RSS Limited**

Auto affix of dedicated C/D

| No. of Input Digits |              |                                                                                                                                                                                                                                                                                                  |
|---------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 13 digits           | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub>                                                                                           |
|                     | Drawing Data | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> C/D<br><div style="text-align: right; margin-right: 50px;">└─ Dedicated check digit</div> |
| 14 digits or more   |              | Not to be drawn                                                                                                                                                                                                                                                                                  |

**Type of Barcode: RSS Expanded**

Auto affix of dedicated C/D

| No. of Input Digits |              |                                                                                                                                                                                                                                                                                                  |
|---------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 70 digits           | Input Data   | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub>                                                                                           |
|                     | Drawing Data | D <sub>1</sub> D <sub>2</sub> D <sub>3</sub> D <sub>4</sub> D <sub>5</sub> D <sub>6</sub> D <sub>7</sub> D <sub>8</sub> D <sub>9</sub> D <sub>10</sub> D <sub>11</sub> D <sub>12</sub> D <sub>13</sub> C/D<br><div style="text-align: right; margin-right: 50px;">└─ Dedicated check digit</div> |
| 71 digits or more   |              | Not to be drawn<br><b>NOTE:</b> Some data cannot be drawn even if the number of input digits is less than 70.                                                                                                                                                                                    |

**Type of Barcode: MATRIX 2 of 5 for NEC**

No affix

|                     |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |
| Max. 126 digits     | Input Data                                                                                                                                                                                                                                    | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> <p style="text-align: right;">└ Not recognized as a check digit.</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                     | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                     | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                     | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |                |
| 127 digits or more  |                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                    |                |                |                |                |                |                |                |                |                |

Modulus check character check

|                                                     |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                |                |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits                                 |                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                |                |
| Min. 2 digits<br>Max. 126 digits<br>(including C/D) | Input Data                                                                                                                                                                                                                                    | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> <p style="text-align: right;">└ To be checked as a modulus check character</p> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                                                     | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub>                                                                                                                                                                                                                                                                                                               | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data                                        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub>                                                                                                                                                                                                                                                                                                               | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |
| D <sub>1</sub>                                      | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub>                                                                                                                                                                                                                                                                                                               | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |                |
| 1 digit<br>127 digits or more                       |                                                                                                                                                                                                                                               | Not to be drawn                                                                                                                                                                                                                                                                                                              |                |                |                |                |                |                |                |                |                |

Auto affix of modulus check character

|                     |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| No. of Input Digits |                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |
| Max. 125 digits     | Input Data                                                                                                                                                                                                                                                                                                                     | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td> </tr> </table> | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |
|                     | D <sub>1</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>2</sub>                                                                                                                                                                                                                                | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> |                |                |
| Drawing Data        | <table border="1"> <tr> <td>D<sub>1</sub></td><td>D<sub>2</sub></td><td>D<sub>3</sub></td><td>D<sub>4</sub></td><td>D<sub>5</sub></td><td>D<sub>6</sub></td><td>D<sub>7</sub></td><td>D<sub>8</sub></td><td>D<sub>9</sub></td><td>C/D</td> </tr> </table> <p style="text-align: right;">└ Affix a modulus check character.</p> | D <sub>1</sub>                                                                                                                                                                                                                                | D <sub>2</sub> | D <sub>3</sub> | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            |
| D <sub>1</sub>      | D <sub>2</sub>                                                                                                                                                                                                                                                                                                                 | D <sub>3</sub>                                                                                                                                                                                                                                | D <sub>4</sub> | D <sub>5</sub> | D <sub>6</sub> | D <sub>7</sub> | D <sub>8</sub> | D <sub>9</sub> | C/D            |                |                |
| 126 digits or more  |                                                                                                                                                                                                                                                                                                                                | Not to be drawn                                                                                                                                                                                                                               |                |                |                |                |                |                |                |                |                |

**16.17. AUTOMATIC ADDITION OF START/STOP CODES**

| Type of Barcode | Designation of Start/Stop Codes | Input Data  | Drawing Data |                |
|-----------------|---------------------------------|-------------|--------------|----------------|
| CODE 39         | Omit<br>(No designation)        | 12345ABC    | Standard     | *12345ABC*     |
|                 |                                 |             | Full ASCII   | *12345ABC*     |
|                 |                                 | *12345ABC   | Standard     | *12345ABC*     |
|                 |                                 |             | Full ASCII   | *12345ABC*     |
|                 |                                 | 12345ABC*   | Standard     | *12345ABC*     |
|                 |                                 |             | Full ASCII   | *12345ABC*     |
|                 |                                 | *12345ABC*  | Standard     | *12345ABC*     |
|                 |                                 |             | Full ASCII   | *12345ABC*     |
|                 |                                 | 12345*ABC   | Standard     | *12345*ABC*    |
|                 |                                 |             | Full ASCII   | *12345/JABC*   |
|                 |                                 | **12345ABC  | Standard     | **12345ABC*    |
|                 |                                 |             | Full ASCII   | */J12345ABC*   |
|                 |                                 | *12345ABC** | Standard     | *12345ABC**    |
|                 |                                 |             | Full ASCII   | *12345ABC/J*   |
|                 |                                 | *12345*ABC* | Standard     | *12345*ABC*    |
|                 |                                 |             | Full ASCII   | *12345/JABC*   |
|                 | Add start code                  | 12345ABC    | Standard     | *12345ABC      |
|                 |                                 |             | Full ASCII   | *12345ABC      |
|                 |                                 | *12345ABC   | Standard     | **12345ABC     |
|                 |                                 |             | Full ASCII   | */J12345ABC    |
|                 |                                 | 12345ABC*   | Standard     | *12345ABC*     |
|                 |                                 |             | Full ASCII   | *12345ABC*     |
|                 |                                 | *12345ABC*  | Standard     | **12345ABC*    |
|                 |                                 |             | Full ASCII   | */J12345ABC*   |
|                 |                                 | 12345*ABC   | Standard     | *12345*ABC     |
|                 |                                 |             | Full ASCII   | *12345/JABC    |
|                 |                                 | **12345ABC  | Standard     | ***12345ABC    |
|                 |                                 |             | Full ASCII   | */J/J12345ABC  |
|                 |                                 | *12345ABC** | Standard     | **12345ABC**   |
|                 |                                 |             | Full ASCII   | */J12345ABC/J* |
|                 |                                 | *12345*ABC* | Standard     | **12345*ABC*   |
|                 |                                 |             | Full ASCII   | */J12345/JABC* |
|                 | Add stop code                   | 12345ABC    | Standard     | 12345ABC*      |
|                 |                                 |             | Full ASCII   | 12345ABC*      |
|                 |                                 | *12345ABC   | Standard     | *12345ABC*     |
|                 |                                 |             | Full ASCII   | *12345ABC*     |
|                 |                                 | 12345ABC*   | Standard     | 12345ABC**     |
|                 |                                 |             | Full ASCII   | 12345ABC/J*    |
|                 |                                 | *12345ABC*  | Standard     | *12345ABC**    |
|                 |                                 |             | Full ASCII   | *12345ABC/J*   |
|                 |                                 | 12345*ABC   | Standard     | 12345*ABC*     |
|                 |                                 |             | Full ASCII   | 12345/JABC*    |
|                 |                                 | **12345ABC  | Standard     | **12345ABC*    |
|                 |                                 |             | Full ASCII   | */J12345ABC*   |
|                 |                                 | *12345ABC** | Standard     | *12345ABC***   |
|                 |                                 |             | Full ASCII   | *12345ABC/J/J* |
|                 |                                 | *12345*ABC* | Standard     | *12345*ABC**   |
|                 |                                 |             | Full ASCII   | *12345/JABC/J* |

| Type of Barcode | Designation of Start/Stop Codes | Input Data   | Drawing Data |              |
|-----------------|---------------------------------|--------------|--------------|--------------|
| CODE 39         | Start/stop code not added       | 12345ABC     | Standard     | 12345ABC     |
|                 |                                 |              | Full ASCII   | 12345ABC     |
|                 |                                 | *12345ABC    | Standard     | *12345ABC    |
|                 |                                 |              | Full ASCII   | *12345ABC    |
|                 |                                 | 12345ABC*    | Standard     | 12345ABC*    |
|                 |                                 |              | Full ASCII   | 12345ABC*    |
|                 |                                 | *12345ABC*   | Standard     | *12345ABC*   |
|                 |                                 |              | Full ASCII   | *12345ABC*   |
|                 |                                 | 12345*ABC    | Standard     | 12345*ABC    |
|                 |                                 |              | Full ASCII   | 12345/JABC   |
|                 |                                 | **12345ABC   | Standard     | **12345ABC   |
|                 |                                 |              | Full ASCII   | */J12345ABC  |
|                 |                                 | *12345ABC**  | Standard     | *12345ABC**  |
|                 |                                 |              | Full ASCII   | *12345ABC/J* |
| *12345*ABC*     | Standard                        | *12345*ABC*  |              |              |
|                 | Full ASCII                      | *12345/JABC* |              |              |

| Type of Barcode | Designation of Start/Stop Codes | Input Data  | Drawing Data |
|-----------------|---------------------------------|-------------|--------------|
| NW7             | Omit<br>(No designation)        | 12345678    | a12345678a   |
|                 |                                 | a12345678   | a12345678    |
|                 |                                 | 12345678c   | 12345678c    |
|                 |                                 | b12345678d  | b12345678d   |
|                 |                                 | 12345a678   | a12345a678a  |
|                 |                                 | ab12345678  | ab12345678   |
|                 |                                 | a12345678bc | a12345678bc  |
|                 |                                 | d12345b678c | d12345b678c  |
|                 | Add start code                  | 12345678    | a12345678    |
|                 |                                 | a12345678   | aa12345678   |
|                 |                                 | 12345678c   | a12345678c   |
|                 |                                 | b12345678d  | ab12345678d  |
|                 |                                 | 12345a678   | a12345a678   |
|                 |                                 | ab12345678  | aab12345678  |
|                 |                                 | a12345678bc | aa12345678bc |
|                 |                                 | d12345b678c | ad12345b678c |
|                 | Add stop code                   | 12345678    | 12345678a    |
|                 |                                 | a12345678   | a12345678a   |
|                 |                                 | 12345678c   | 12345678ca   |
|                 |                                 | b12345678d  | b12345678da  |
|                 |                                 | 12345a678   | 12345a678a   |
|                 |                                 | ab12345678  | ab12345678a  |
|                 |                                 | a12345678bc | a12345678bca |
|                 |                                 | d12345b678c | d12345b678ca |
|                 | Start/stop code not added       | 12345678    | 12345678     |
|                 |                                 | a12345678   | a12345678    |
|                 |                                 | 12345678c   | 12345678c    |
|                 |                                 | b12345678d  | b12345678d   |
|                 |                                 | 12345a678   | 12345a678    |
|                 |                                 | ab12345678  | ab12345678   |
|                 |                                 | a12345678bc | a12345678bc  |
|                 |                                 | d12345b678c | d12345b678c  |