



TOSHIBA TEC Bar Code Printer

B-472-QQ/QP

External Equipment Interface Specification

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TOSHIBA TEC CORPORATION

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1. SCOPE

This specification applies to the external equipment interface for use with the Model B-472-QQ/B-472-QP general purpose thermal label/tag printers.

2. GENERAL DESCRIPTION

The external equipment interface connects the host computer with a printer through a serial interface (RS-232C) or parallel interface (Centronics) for making various settings and printing labels.

This specification describes how to use the external equipment interface.

3. INTERFACE

3.1 SERIAL INTERFACE

- (1) Type: Conforming to RS-232C
- (2) Mode of Communication: Full duplex
- (3) Transmission Speed: 2400 bps
4800 bps
9600 bps
19200 bps
- (4) Synchronization Method: Start-stop synchronization
- (5) Start Bit: 1 bit
- (6) Stop Bit: 1 bit
2 bits
- (7) Data Length: 7 bits
8 bits
- (8) Parity: None
Even
Odd
- (9) Error Detection: Parity Error Vertical parity error check
Framing Error This error occurs if no stop bit is found in the frame specified starting with the start bit.
Overrun Error This error occurs if the next data is input before the data input to the UART from the host is read by the printer CPU.
- (10) Protocol: No-procedure method
- (11) Data Input Code: ASCII code
European character set 8 bit code
Graphics 8 bit code
JIS 8 code (for the JA model only)
Shift JIS Kanji code (for the JA model only)
JIS Kanji code (for the JA model only)
- (12) Receive Buffer: 5 K bytes

- (13) Transmission Control: XON/XOFF (DC1/DC3) protocol
READY/BUSY (DTR) protocol
XON/XOFF (DC1/DC3) protocol + READY/BUSY (DTR) protocol
READY/BUSY (RTS) protocol

① XON/XOFF (DC1/DC3) Protocol

- When initialized after power on, this printer becomes ready to receive data and sends an XON code (11H). (Transmission or non-transmission of XON code is selectable by means of the DIP switch.)
- The printer sends an XOFF code (13H) when the blank positions in the receive buffer become 800 bytes or less.
- The printer sends an XON code (11H) when the blank positions in the receive buffer are 2K bytes or more.
- When there are no blank positions in the receive buffer, the printer discards data received exceeding the receive buffer capacity, without storing it in the buffer. (After detecting the XOFF code, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer sends an XOFF code (13H) when the power is off. (Transmission or non-transmission of the XOFF code is selectable by means of the DIP switch.)

② READY/BUSY (DTR) Protocol

- When initialized after power on, this printer becomes ready to receive data and turns the DTR signal to "High" level (READY).
- The printer turns the DTR signal to "Low" level (BUSY) when the blank positions in the receive buffer are 800 bytes or less.
- The printer turns the DTR signal to "High" level (READY) when the blank positions in the receive buffer are 2K bytes or more.
- When there are no blank positions in the receive buffer, the printer discards data received exceeding the receive buffer capacity, without storing it in the buffer. (After detecting the BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)

③ XON/XOFF (DC1/DC3) Protocol + READY/BUSY (DTR) Protocol

- When initialized after power on, this printer becomes ready to receive data and turns the DTR signal to “High” level (READY). It also sends an XON code (11H).
- When the blank positions in the receive buffer are 800 bytes or less, the printer turns the DTR signal to “Low” level (BUSY) and sends an XOFF code (13H).
- When the blank positions in the receive buffer are 2K bytes or more, the printer turns the DTR signal to “High” level (READY) and sends an XON code (11H).
- When there are no blank positions in the receive buffer, the printer discards received exceeding the receive buffer capacity, without storing it in the buffer. (After detecting the XOFF code or BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer sends an XOFF code (13H) when the power is off.

④ READY/BUSY (RTS) Protocol

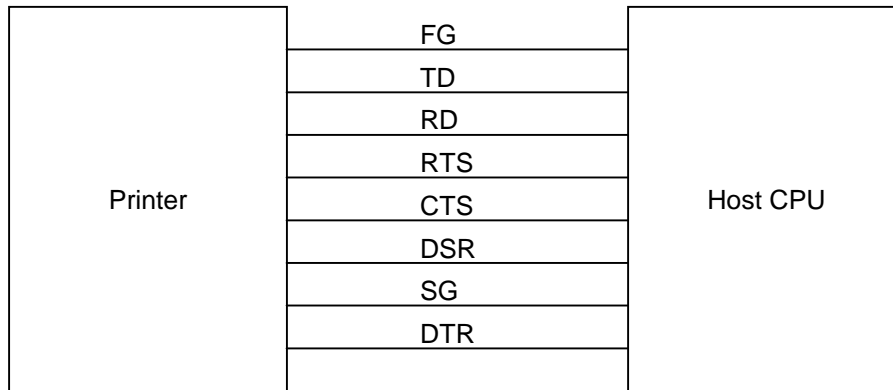
- When initialized after the power is turned on, this printer becomes ready to receive data and turns the RTS signal to “High” (READY).
- The printer turns the RTS signal to “Low” (BUSY) when the blank positions in the receive buffer are 800 bytes or less.
- The printer turns the RTS signal to “High” (READY) when the blank positions in the receive buffer are 2K bytes or more.
- When there are no blank positions in the receive buffer, the printer discards data received that exceeds the receive buffer capacity, without storing it in the buffer. (After detecting the BUSY signal, the host computer must stop transmission before the printer receive buffer becomes full.)
- The printer must always turn the DTR signal to “High”. The host must always turn the DSR signal to “High”.

* When the flow control is performed in Windows, the RTS/BUSY (RTS) protocol should be selected. At the time, “Hardware” should be selected for the flow control in the communication port setting in Windows.

NOTE: *In READY/BUSY (DTR) protocol, data should be sent 200 ms or later after the DTR signal becomes “High” (READY) when the printer is turned on.*

In READY/BUSY (RTS) protocol, data should be sent 200 ms or later after the RTS signal becomes “High” (READY) when the printer is turned on.

(14) Input/Output Signals

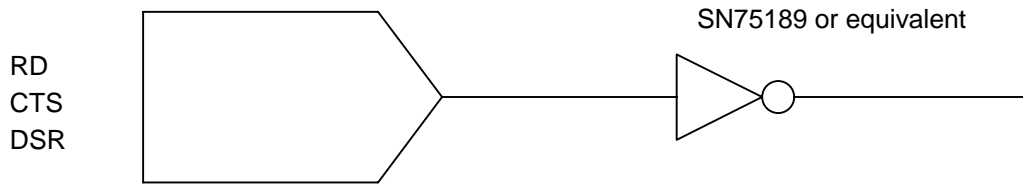


(15) Connector Pin Assignment and Signal Description

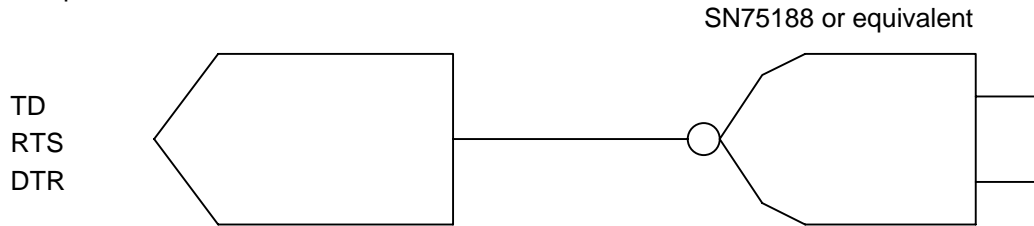
Pin No.	Signal Name	Function	Signal Direction
1	FG	<ul style="list-style-type: none"> ● Ground line for circuit protection 	
2	RD	<ul style="list-style-type: none"> ● Line for data which the printer receives from the host. ● Logic 1 is a Low level, while logic 0 is a High level. ● It is in the Low (Mark) state when no transmission is in progress. 	← Host
3	TD	<ul style="list-style-type: none"> ● 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 the Low (Mark) state when no transmission is in progress. 	Printer →
4	CTS	<ul style="list-style-type: none"> ● Input signal from the host. ● For the printer to send data, the signal must be "High" level. 	← Host
5	RTS	<ul style="list-style-type: none"> ● Output signal to the host. <p>For the READY/BUSY (DTR) protocol:</p> <ul style="list-style-type: none"> ● It indicates that there is data to be output to the host. ● After the power is turned on, it is always "High". <p>For the READY/BUSY (RTS) protocol:</p> <ul style="list-style-type: none"> ● It indicates the ready state for the received data. ● It is at "Low" level when the receive buffer is nearly full, and at "High" level when nearly empty. 	Printer →
6	DTR	<ul style="list-style-type: none"> ● Output signal to the host. <p>For the READY/BUSY (RTS) protocol:</p> <ul style="list-style-type: none"> ● It indicates that there is data to be output to the host. ● After the power is turned on, it is always "High". <p>For the READY/BUSY (DTR) protocol:</p> <ul style="list-style-type: none"> ● It indicates the ready state for the received data. ● It is at "Low" level when the receive buffer is nearly full, and at "High" level when nearly empty. 	Printer →
7	SG	<ul style="list-style-type: none"> ● Ground line for all data and control signals. 	
20	DSR	<ul style="list-style-type: none"> ● Input signal from the host. ● For the printer to receive data, it must be at "High" level. 	← Host

(16) Interface Circuit

● Input Circuit



● Output Circuit



● Signal Levels

Input Voltage	H....+3 ~ +15V
	L.....-3 ~ -15V
Output Voltage	H....+6 ~ +13V
	L.....-6 ~ -13V

3.2 PARALLEL INTERFACE

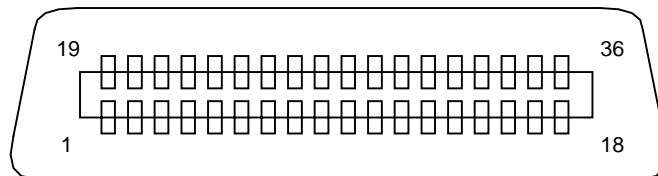
- (1) Type: Centronics
- (2) Data Input Method: Parallel 8 bits (DATA1 ~ 8)
- (3) Control Signals: $\overline{\text{ACK}}$, $\overline{\text{BUSY}}$, $\overline{\text{PAUSE}}$, $\overline{\text{DATA} \bullet \text{STB}}$, $\overline{\text{FAULT}}$, PE, $\overline{\text{INPUT} \bullet \text{PRIME}}$
- (4) Data Input Code: ASCII code
European character set 8 bit code
Graphics 8 bit code
JIS 8 code (for the JA model only)
Shift JIS Kanji code (for the JA model only)
JIS Kanji code (for the JA model only)
- (5) Receive Buffer: 5K bytes
- (6) Input/Output Circuit Configuration and Input/Output Conditions:

	Signal	Configuration	
Input	DATA1 ~ 8		Logical level (Input) "1" = 2 ~ 5 V "0" = 0 ~ 0.4 V
	$\overline{\text{DATA} \bullet \text{STB}}$ $\overline{\text{INPUT} \bullet \text{PRIME}}$		
Output	$\overline{\text{BUSY}}$, $\overline{\text{FAULT}}$, $\overline{\text{ACK}}$, $\overline{\text{PAUSE}}$, PE		Logical level (Input) "1" = 2.4 ~ 5 V "0" = 0 ~ 0.4 V

- (7) Connector:
 - Printer
 - Amp. Japan 552742-1 or equivalent
 - DDK 57RE-40360-73B or equivalent
 - Cable
 - Amp. Japan 552470-1 or equivalent
 - DDK 57E-30360 or equivalent

(8) Connector Pin Diagram:

Pin No.	Signal Name	Pin No.	Signal Name
1	$\overline{\text{DATA}} \bullet \text{STB}$	19	TWISTED PAIR GND (PIN1)
2	DATA 1	20	TWISTED PAIR GND (PIN2)
3	DATA 2	21	TWISTED PAIR GND (PIN3)
4	DATA 3	22	TWISTED PAIR GND (PIN4)
5	DATA 4	23	TWISTED PAIR GND (PIN5)
6	DATA 5	24	TWISTED PAIR GND (PIN6)
7	DATA 6	25	TWISTED PAIR GND (PIN7)
8	DATA 7	26	TWISTED PAIR GND (PIN8)
9	DATA 8	27	TWISTED PAIR GND (PIN9)
10	$\overline{\text{ACK}}$	28	TWISTED PAIR GND (PIN10)
11	BUSY	29	TWISTED PAIR GND (PIN11)
12	PE	30	TWISTED PAIR GND (PIN31)
13	$\overline{\text{PAUSE}}$	31	$\overline{\text{INPUT}} \bullet \text{PRIME}$
14	0 V	32	$\overline{\text{FAULT}}$
15	NC	33	0 V
16	0 V	34	NC
17	CHASSIS GND	35	NC
18	+5 V	36	NC



(9) Input/Output Signals :

① DATA 1 ~ 8 (Printer ← Host)

- Input data signals for the 1st to 8th bits.
- Logic 1 is “High” level.
- Min. data pulse width of 2.5 μsec.

② $\overline{\text{DATA}} \bullet \overline{\text{STROBE}}$ ($\overline{\text{DATA}} \bullet \overline{\text{STB}}$) (Printer ← Host)

- Synchronizing signal for reading the above data.
- Normally at “High” level. The data is read at the rise of the Low level pulse.
- Minimum data pulse width of 0.5 μsec.

③ BUSY (Printer → Host)

- This signal indicates that the printer is in a BUSY state.
- When initialized after power on, the printer becomes ready to receive data and turns the signal to “Low” level.
- The signal turns to “High” level (in a BUSY state) when data is set from the host (at the fall of the $\overline{\text{DATA}} \bullet \overline{\text{STB}}$ signal).
- The signal turns to “Low” level when the printer reads the data.
- When the blank positions in the receive buffer are 512 bytes or less, the printer keep the signal at “High” level (in a BUSY state) for 10 seconds when data is set from the host, to extend the data read interval.
- When there are no blank positions in the receive buffer, the printer stops reading data. Then, it keeps the signal at “High” level (in a BUSY state) until there are blank positions in the receive buffer when data is set from the host.
- The signal is kept at “High” level (in a BUSY state) until the current state (one of the following states) is reset.
 - PAUSE state caused by the [PAUSE] key
 - Paper End state
 - Ribbon End state
 - Head Open state
 - Printer Error state
 - Initialization in progress upon receipt of the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal

④ $\overline{\text{ACKNOWLEDGE}}$ ($\overline{\text{ACK}}$) (Printer → Host)

- This signal indicates that the printer has read the data set by the host and is ready to receive the next data.
- Normally at “High” level. It is at “Low” level for about 5 μsec. after the fall of the BUSY signal.
- The host should usually set data after the $\overline{\text{ACK}}$ signal turns from “Low” to “High” level.
- If the host ignores the $\overline{\text{ACK}}$ signal and sets the next data while the $\overline{\text{ACK}}$ signal is at “Low” level, the signal will further continue to be at “Low” level for about 5 μsec. after the fall of the BUSY signal (the data will still be received normally in this case).

⑤ $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ (Printer \leftarrow Host)

- Reset request signal from the host.
- Normally at “High” level. A low on this input causes the printer to be initialized in the same manner as when the power is turned on.
 - * When “Reset process when the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal is on” is set to OFF in the parameter setting in the system mode, the printer is not in the same initial state obtained after the power is turned on, even if a low signal is input.
- When the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal is input during printing, the printer finish printing one tag label in printing and then cancels the next processing and is initialized in the same manner as when the power is turned on.
 - * When “Reset process when the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal is on” is set to OFF in the parameter setting in the sytem mode, the printer performs the next process without stopping.
- Minimum pulse width of 0.5 μ sec.

⑥ $\overline{\text{PAUSE}}$ (Printer \rightarrow Host)

- This is an output signal which indicates whether the printer is in PAUSE state or placed online. The printer can receive data while placed online.
- The signal is at “Low” level while the printer is in a PAUSE state.
- The signal is kept at “Low” level (in a PAUSE state) until the current state (one of the following states) is reset.
 - PAUSE state caused by the [PAUSE] key
 - Paper End state
 - Ribbon End state
 - Head Open state
 - Printer Error state
 - Initialization in progress upon power on or receipt of the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal

⑦ $\overline{\text{FAULT}}$ (Printer \rightarrow Host)

- Output signal indicating that the printer is in a FAULT state.
- At “Low” level while the printer is in a FAULT state.
- The signal is kept at “Low” level (in a FAULT state) until the current state (one of the following states) is reset.
 - PAUSE state caused by the [PAUSE] key
 - Paper End state
 - Ribbon End state
 - Head Open state
 - Printer Error state
 - Initialization in progress upon power on or receipt of the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal

⑧ PE (Printer \rightarrow Host)

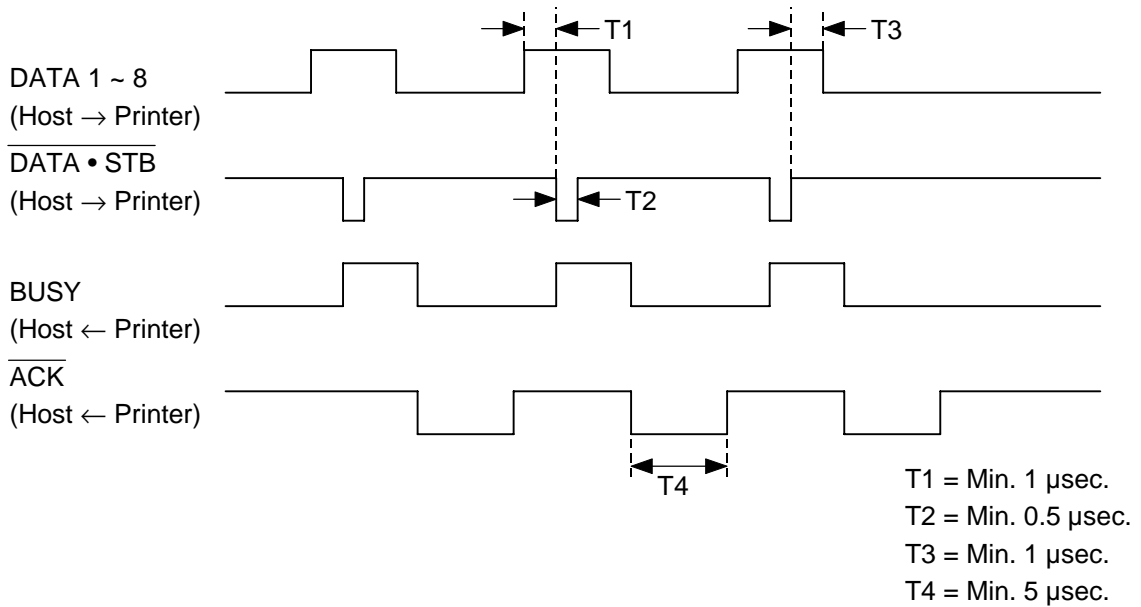
- Output signal indicating a Label End or Ribbon End state.
- At “High” level when a Label End or Ribbon End state occurs.
- Turns to “Low” level when the Label End or Ribbon End state is reset.

⑨ +5 V

- This is not a signal but a +5 V power supply voltage.
- The maximum current of 500 mA can be taken out.

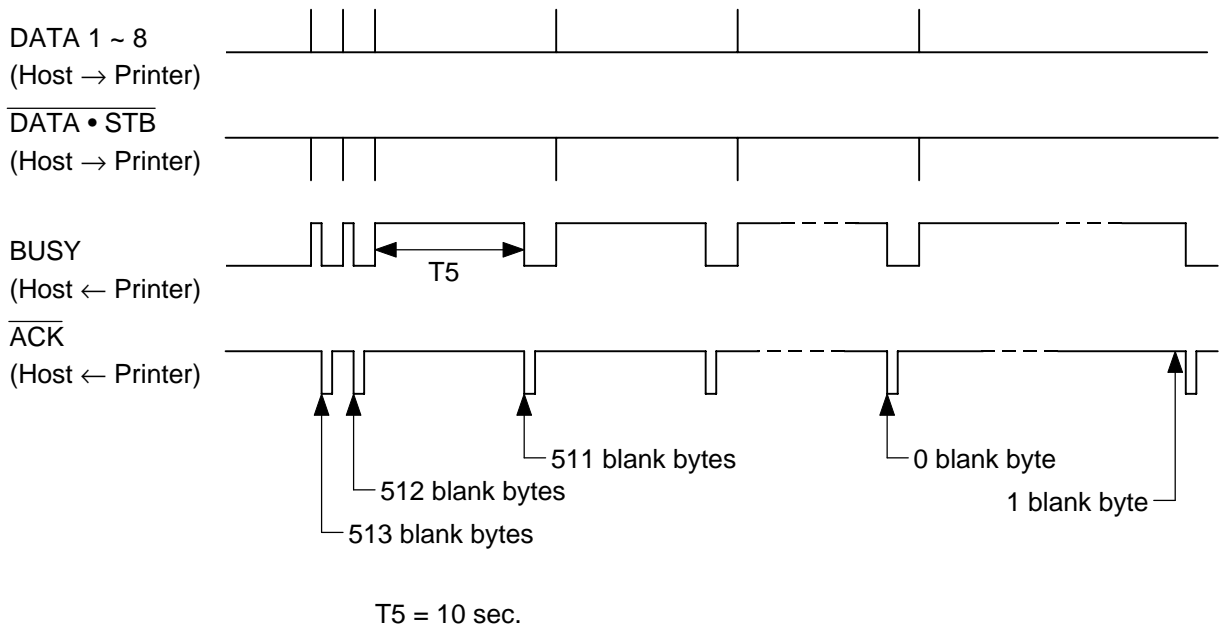
(10) Timing Chart

① When receiving normal data:



② Receiving data when the blank positions in the receive buffer are 512 bytes or less:

- When the blank positions in the receive buffer are 512 bytes or less, the printer continues to be in a BUSY state (BUSY signal at “High” level) for 10 seconds to extend the data read interval when data is set from the host and reads the data 10 seconds later.
- If the blank positions are 513 bytes or more while waiting for reading data, the printer will receive the data with the normal data receive timing.
- When there are no blank positions in the receive buffer, the printer stops reading data. Then, it continues to be in a BUSY state (BUSY signal at “High” level) until there are blank positions in the receive buffer when data is set from the host.



4. KEY OPERATION FUNCTIONS

4.1 DIP SW FUNCTIONS

(1) DIP SW 1 (Lower SW)

No.	ON/OFF			Function	Note
1	OFF			Without	Automatic ribbon saving
	ON			With	
2	2	3	4	English	LCD error message display language
	OFF	OFF	OFF	German	
3	OFF	ON	OFF	French	
	ON	ON	OFF	Dutch	
4	OFF	OFF	ON	Spanish	
	ON	OFF	ON	Japanese (Note 1)	
5	OFF	ON	ON	Italian	
	ON	ON	ON	English	
6	OFF			No	Automatic forward feed standby in cut mode
	ON			Yes	
7	OFF			No	Use of built-in rewinder or cutting operation
	ON			Yes	
8	OFF			Normal cut	Set to OFF
	ON			Head-up cut	
9	OFF			Not used	Operation mode
	ON			Remote program load mode	

(2) DIP SW 2 (Upper SW)

No.	ON/OFF		Function	Note
1	1	2		Transmission speed
	OFF	OFF	2400 bps	
	ON	OFF	4800 bps	
	OFF	ON	9600 bps	
2	ON	ON	19200 bps	
	OFF		1 bit	Stop bit length
3	ON		2 bits	
	4	OFF		7 bits	Data bit length
ON		8 bits		
5	OFF		Without	With/without parity
	ON		With	
6	OFF		Even	Parity (valid only when No. 5 is ON)
	ON		Odd	
7	7	8		Transmission control system
	OFF	OFF	XON/XOFF protocol (Note 2)	
	ON	OFF	READY/BUSY (DTR) protocol (Note 2) READY/BUSY (RTS) protocol (Note 4)	
8	OFF	ON	XON/XOFF + READY/BUSY protocol (DTR) (Note 3)	
	ON	ON	XON/XOFF protocol (Note 3)	

- NOTES:**
- (1) When Japanese is selected, the character code is partially changed. For details, refer to the character code table described later.
 - (2) An XON is not output at power on and an XOFF is not output at power off.
 - (3) An XON is output at power on and an XOFF is output at power off.
 - (4) The protocol between DTR and RTS is selected in the parameter setting in the system mode.

* The DIP switch statuses are read when the printer power is turned on.

4.2 SYSTEM MODE FUNCTIONS

The system mode has the following functions for the printer self-test and setting various parameters. (For details, refer to Key Operation Specification.)

(1) Self-test

- Maintenance counter, printing various parameters
- Automatic self-test

(2) Setting various parameters

- Feed fine adjustment (± 50.0 mm)
- Cut position fine adjustment (± 50.0 mm)
(or strip position fine adjustment)
- Back feed fine adjustment (± 9.5 mm)
- X-coordinate fine adjustment (± 99.5 mm)
- Print density fine adjustment (Thermal transfer: ± 10, Direct thermal: ± 10)
- Type of character code (PC-850, PC-8)
- Selection of 0 font (Without slash mark [0], With slash mark [0])
- Type of control code

Automatic selection
Manual selection (ESC, LF, NUL method)
Manual selection ( {, |, } method)
Code designation (Manual method)
- Type of ribbon (Transmissive ribbon, Non-transmissive ribbon)
- Ribbon motor drive voltage fine adjustment (-15 ~ 0 step)
- Strip status selection (Not selected/Selected)
- Reflective sensor manual threshold fine adjustment setting (0.0 to 4.0 V)
- Transmissive sensor manual threshold fine adjustment setting (0.0 to 4.0 V)
- Kanji code selection (For Windows codes/For original codes)
- Stepping motor selection (Motor made by Sanyo, Motor made by NMB)
- Euro code (new currency symbol) setting (20H to FFH)
- READY/BUSY control protocol selection (DTR protocol, RTS protocol)
- Reset process when the INPUT • PRIME signal is ON (ON: Performed, OFF: Not performed)

(3) Test print

(4) Sensor display/adjustment

- Thermal head temperature sensor indication
- Open-air temperature sensor indication
- Reflective sensor indication/adjustment
- Transmissive sensor indication/adjustment
- Reflective sensor adjustment value indication/adjustment (without paper)
- Transmissive sensor adjustment value indication/adjustment (without paper)

(5) RAM clear

- Maintenance counter clear
- Parameter clear

(6) Initial values after RAM clear

① Initial values after maintenance counter clear

Parameter	Initial Value
Label distance covered	0 km
Printed distance	0 km
Cut count	0
Head up/down count	0
Ribbon motor drive time	0 hour
Head up solenoid drive time	0 hour
RS-232C hard error count	0
System error count	0
Momentary power interruption count	0

② Initial values after parameter clear

Parameter	Initial Value
Feed fine adjustment (PC)	0 mm
Cut position (or strip position) fine adjustment (PC)	0 mm
Back feed fine adjustment (PC)	0 mm
Print density fine adjustment (thermal transfer) (PC)	0
Print density fine adjustment (direct thermal) (PC)	0
Feed fine adjustment (key)	0 mm
Cut position (or strip position) fine adjustment (key)	0 mm
Back feed fine adjustment (key)	0 mm
Print density fine adjustment (thermal transfer) (key)	0
Print density fine adjustment (direct thermal) (key)	0
X-coordinate fine adjustment	0 mm
Type of character code	PC-850
Font of 0	"0" without slash mark
Type of control code	Automatic selection
Type of ribbon	Transmissive
Ribbon motor drive voltage fine adjustment (PC)	0
Ribbon motor drive voltage fine adjustment (key)	0
Strip status selection	1
Status response	Yes
Reflective sensor manual threshold fine adjustment value	1.0 V
Transmissive sensor manual threshold fine adjustment value	1.4 V
Label pitch	76.2 mm
Effective print length	74.2 mm
Effective print width	104 mm
With/without ribbon	With
Type of sensor	Transmissive sensor
Feed speed	6"/sec.
Issue mode	Batch (without cutting)

Parameter	Initial Value
PC save automatic call	With
Kanji code	TYPE 1
Euro code (New currency symbol)	B0H
READY/BUSY control protocol	DTR
Reset process when the $\overline{\text{INPUT}} \bullet \overline{\text{PRIME}}$ signal is on	ON

- NOTES:**
1. The total label distance covered, sensor adjustment values (system mode <4>), and data of the flash card are not cleared by RAM clear.
 2. If “3: Transmissive sensor (when using preprinted labels)” or “4: Reflective sensor (when using a manual threshold value)” is selected for the type of sensor for a label issue when a parameter clear is performed, the threshold setting should be made again.

4.3 ONLINE MODE FUNCTIONS

The online mode provides the following functions for issuing labels and setting the threshold. (For details, refer to Key Operation Specification.)

- (1) Issuing labels (by external equipment interface commands)
- (2) Paper feed (by the [FEED] key)
- (3) Pause (Halts issuing labels by the [PAUSE] key)
- (4) Restart (Reissues labels by the [RESTART] key after halting issuing labels or after the occurrence of an error.)
- (5) Reset (Enters an usual initial state which is obtained after the power is turned on, using the [RESTART] key.)
- (6) Error indication
- (7) Threshold setting (printed labels)
- (8) Various parameters setting (Parameters including feed fine adjustment and print density fine adjustment are programmed.)

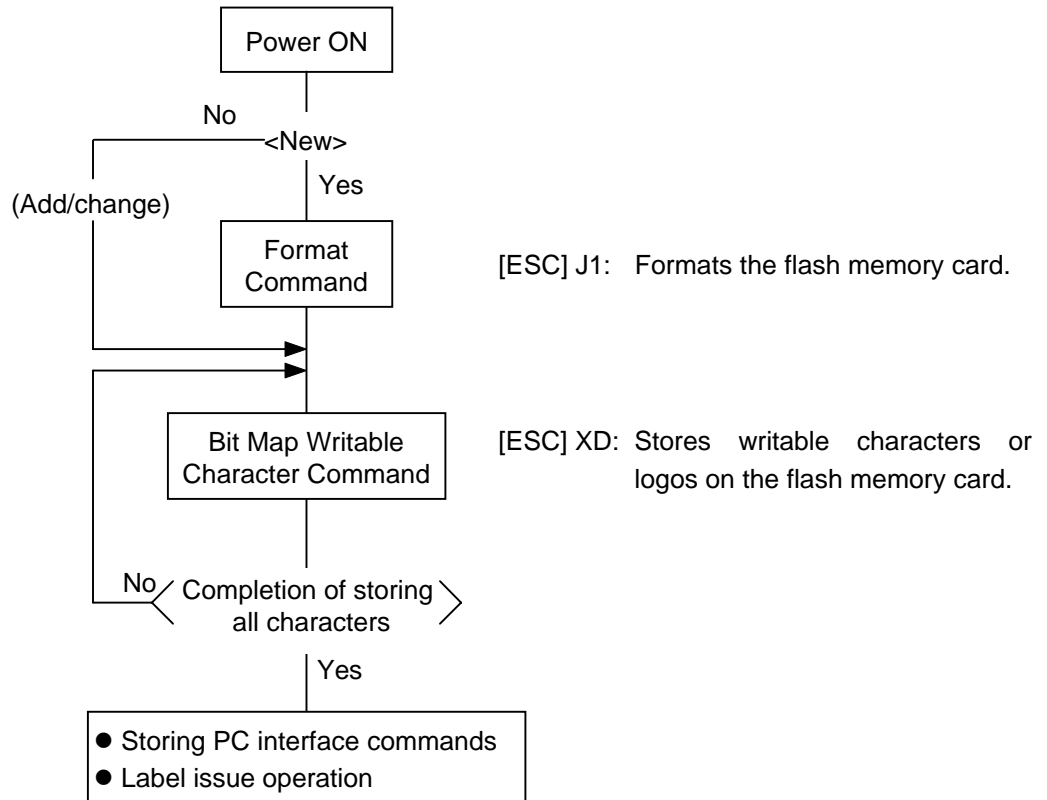
5. TRANSMISSION SEQUENCE

This section describes the outline of the transmission sequence.

5.1 INITIALIZATION

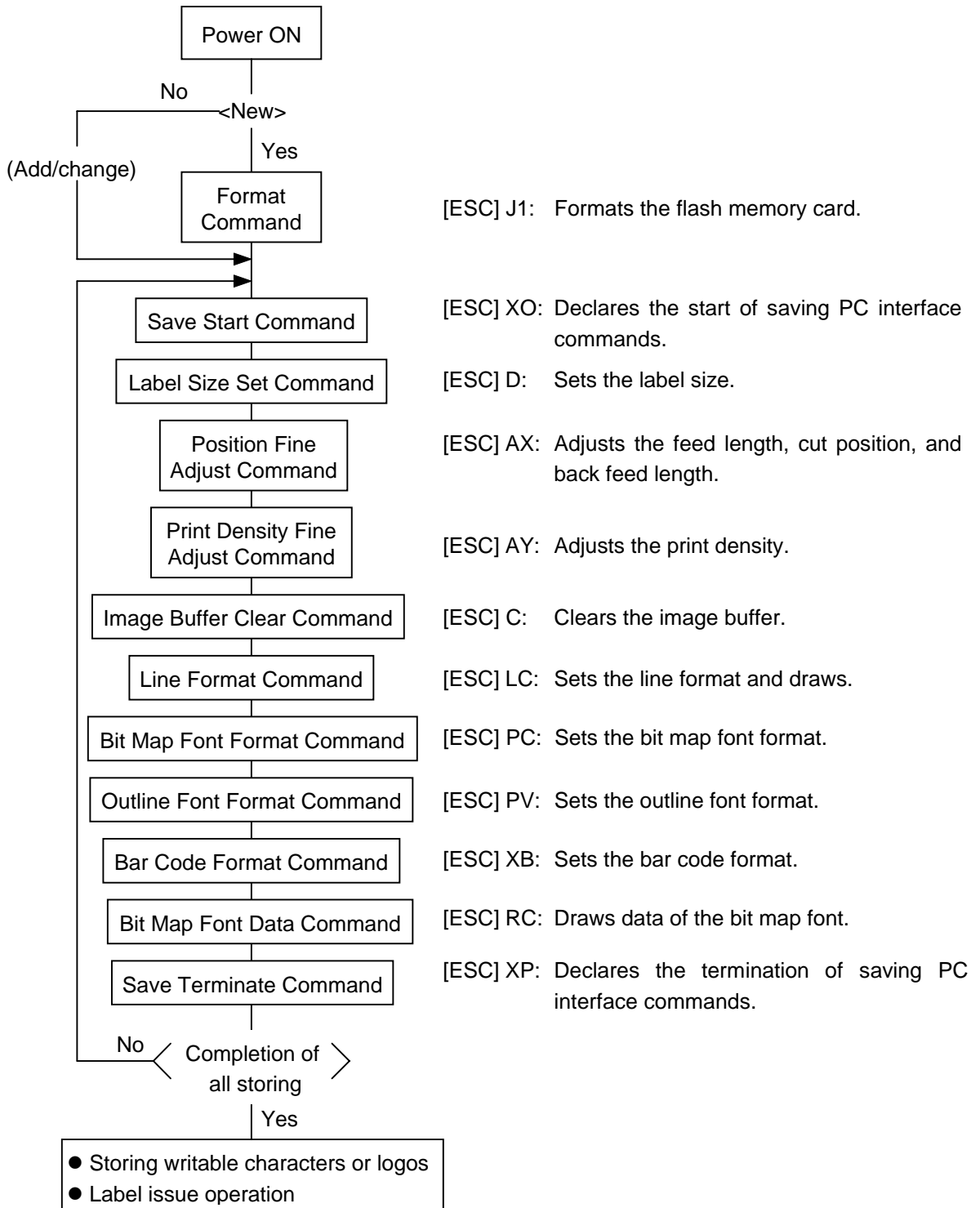
Writable characters, logos, and PC interface commands must be stored before the label issue operation.

- (1) Storing writable characters and logos



- NOTES:**
- (1) Storing writable characters or logos is not necessary if not required.
 - (2) A flash memory card is necessary for storing writable characters or logos.
 - (3) Unless the Format Command is sent before storing already stored writable characters or logos (storing the same numbers), memory will be consumed every such storing.
 - (4) Before another operation (storing PC interface commands, label issue operation) is performed after storing writable characters or logos, the image buffer will be cleared automatically.
 - (5) If another storing operation is not continued after storing writable characters or logos, the printer automatically enters the online mode (label issue operation) after about 10 seconds. In this case, the image buffer will be cleared automatically.
 - (6) The flash memory card should be inserted/removed when the power is off. If the card is inserted to register data for the writable characters or logos after the power is turned on, the data may be damaged.

(2) Storing PC interface commands

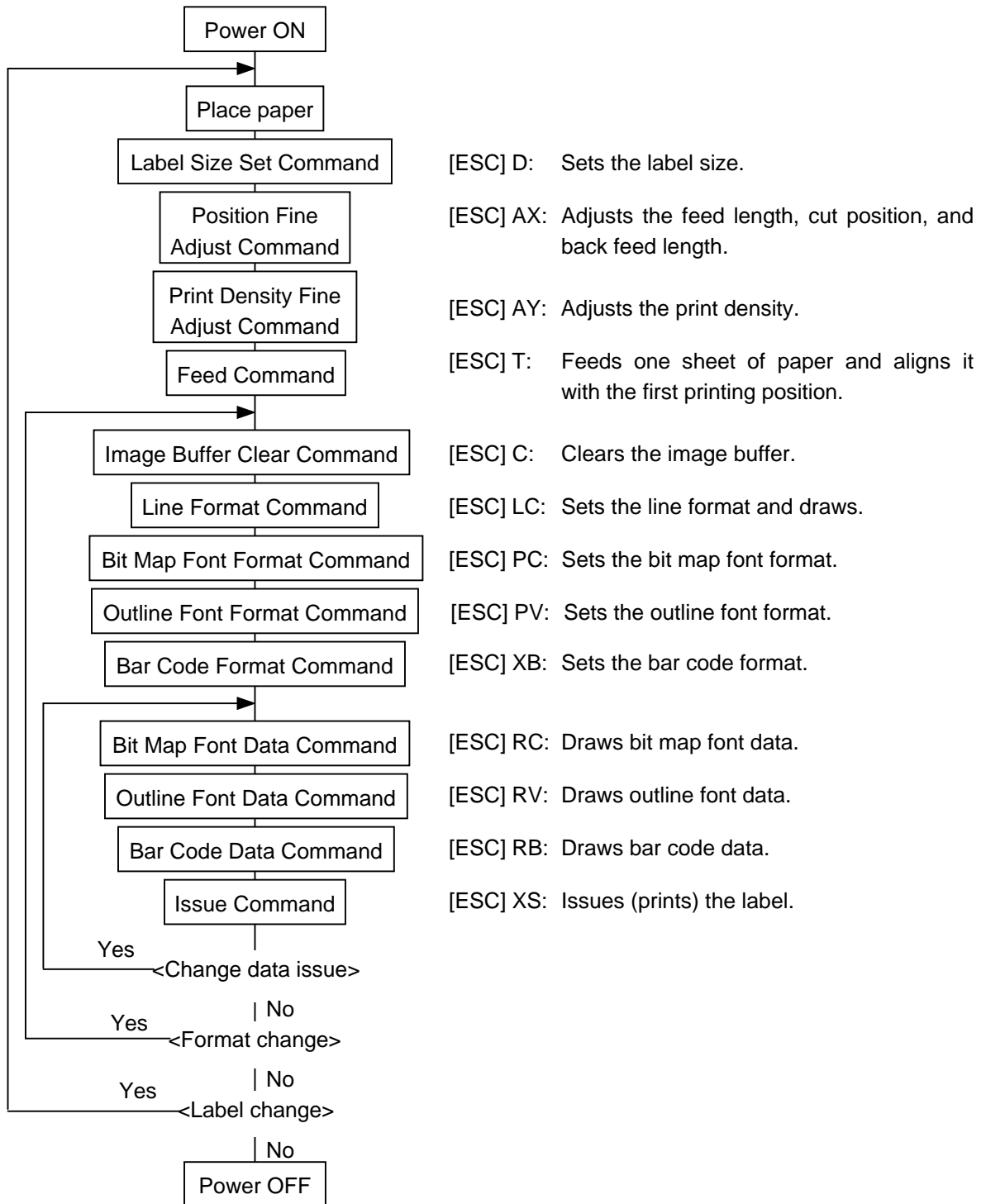


- NOTES:**
- (1) *Storing PC interface commands is not necessary if not required.*
 - (2) *A flash memory card is necessary for storing PC interface commands.*
 - (3) *Unless the Format Command is sent before storing already stored PC interface commands (storing the same numbers), memory will be consumed every such storing.*
 - (4) *Before another operation (storing writable characters or logos, label issue operation) is performed after storing PC interface commands, the image buffer will be cleared automatically.*
 - (5) *Select commands to be stored as occasion demands.*
 - (6) *If another storing operation is not continued after storing PC interface commands, the printer enters the online mode (label issue operation) after about 10 seconds. In this case, the image buffer will be cleared automatically.*
 - (7) *The flash memory card should be inserted/removed when the power is off. If the card is inserted to register the PC interface commands after the power is turned on, data may be damaged.*

5.2 LABEL ISSUE OPERATION

An example of the label issue operation is described below.

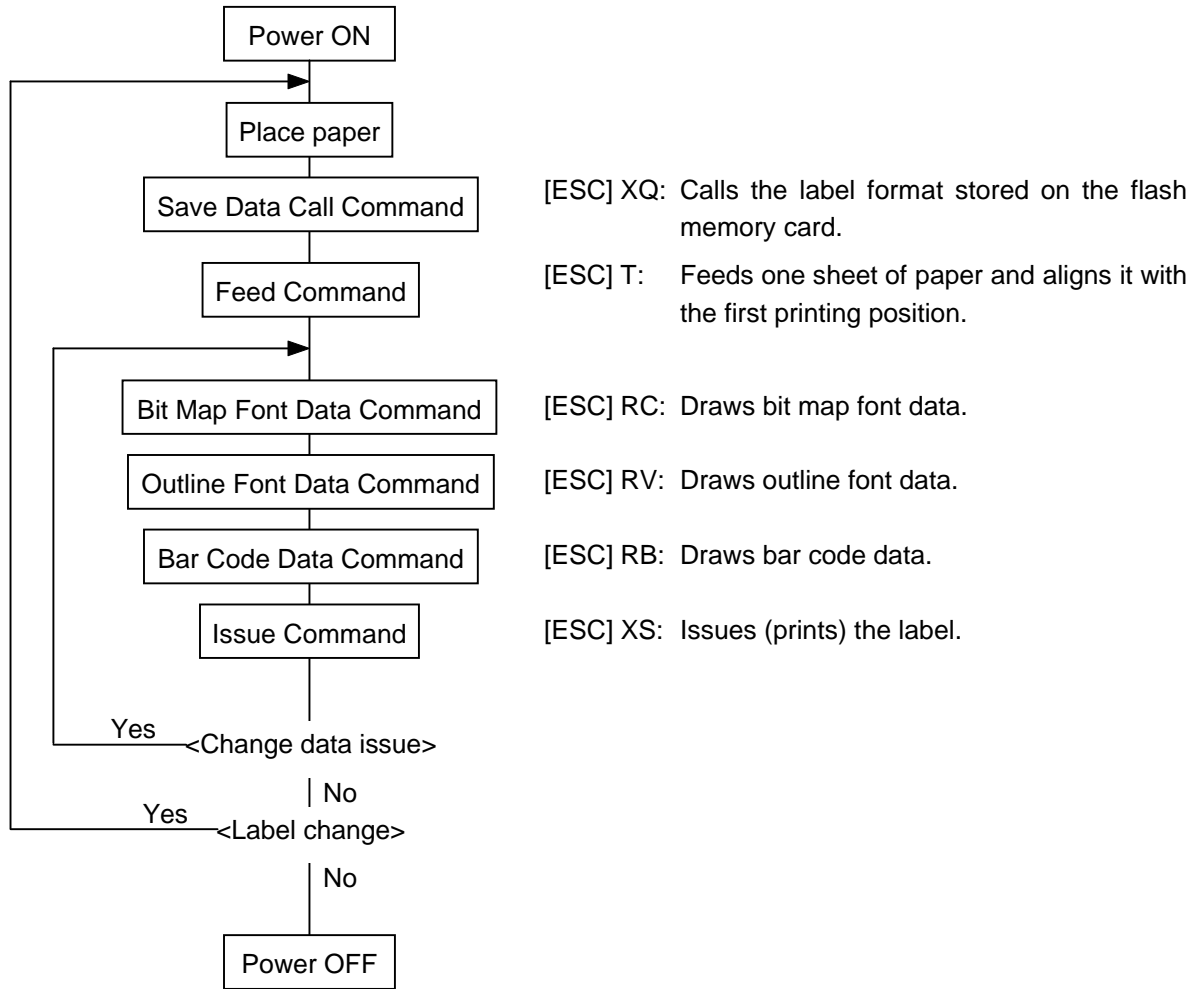
(1) Where the Save Data Call Command is not used:



NOTES: (1) When placing new paper, the Label Size Set Command and Feed Command must always be sent. When using the same paper after the power is turned off and then on, the Label Size Set Command and Feed Command may be omitted.

(2) After the power is turned off and then on, the Bit Map Font, Outline Font, and Bar Code Format Commands should be sent as occasion demands because they are not protected in memory.

(2) Where the Save Data Call Command is used:



- NOTES:** (1) When placing new paper, the Feed Command must always be sent. When using the same paper after the power is turned off and then on, the Feed Command may be omitted.
- (2) If the option for “automatic call at power on” for the Save Data Call Command has previously been selected, the Save Data Call Command may be omitted after the power is turned off and then on.

6. INTERFACE COMMANDS

6.1 OUTLINE OF COMMANDS

(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 three kinds of control codes:
 - ① ESC (1BH), LF (0AH), NUL (00H)
 - ② { (7BH), | (7CH), } (7DH)
 - ③ Control code set by manual method (in the system mode parameter setting)

(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 the 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 entry must be fixed as 3 digits.

Explanation Explains the command in detail.

Note Supplementary explanation of the command.

Refer to Related commands

Examples Explains the command examples.

20 PRINT #1, ESC\$; "T10C61"; LF\$; NUL\$;

The above corresponds to the transfer of the following:

$\frac{1B}{[ESC]}$ $\frac{54}{T}$ $\frac{31}{1}$ $\frac{30}{0}$ $\frac{43}{C}$ $\frac{36}{6}$ $\frac{31}{1}$ $\frac{0A}{[LF]}$ $\frac{00}{[NUL]}$

(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 operation will not be guaranteed. The commands must be used in the online mode. If any command is transmitted in system mode, the printer will not operate. However, only the Reset Command can be used.

6.2 LIST OF COMMANDS

(1) Commands related to setting	
Label Size Set Command	[ESC] D .....23
(2) Commands related to fine adjustment	
Position Fine Adjust Command	[ESC] AX .....26
Print Density Fine Adjust Command	[ESC] AY .....32
Ribbon Motor Drive Voltage Fine Adjust Command	[ESC] RM .....33
(3) Commands related to clear	
Image Buffer Clear Command	[ESC] C .....34
Clear Area Command	[ESC] XR .....35
(4) Commands related to drawing format setting	
Line Format Command	[ESC] LC .....37
Bit Map Font Format Command	[ESC] PC .....41
Outline Font Format Command	[ESC] PV .....53
Bar Code Format Command	[ESC] XB .....64
(5) Commands related to print data	
Bit Map Font Data Command	[ESC] RC .....97
Outline Font Data Command	[ESC] RV .....100
Bar Code Data Command	[ESC] RB .....103
(6) Commands related to issue and feed	
Issue Command	[ESC] XS .....117
Feed Command	[ESC] T .....129
Eject Command	[ESC] IB .....134
Forward/Reverse Feed Command	[ESC] U .....135
(7) Commands related to writable characters	
Format Command	[ESC] J1 .....137
Bit Map Writable Character Command	[ESC] XD .....138
(8) Commands related to graphics	
Graphic Command	[ESC] SG .....142
(9) Commands related to PC command saving	
Format Command	[ESC] J1 .....137
Save Start Command	[ESC] XO .....149
Save Terminate Command	[ESC] XP .....150
Saved Data Call Command	[ESC] XQ .....151
(10) Commands related to display	
Message Display Command	[ESC] XJ .....152
(11) Commands related to control	
Reset Command	[ESC] WR .....154
(12) Commands related to status	
Status Request Command	[ESC] WS .....155

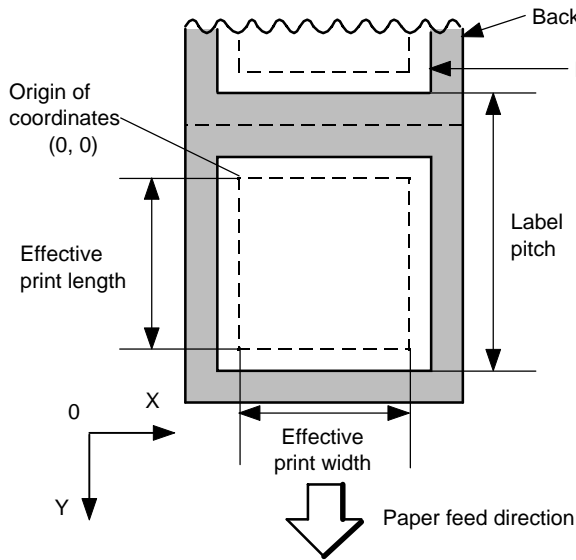
6.3 LABEL SIZE SET COMMAND

[ESC] D

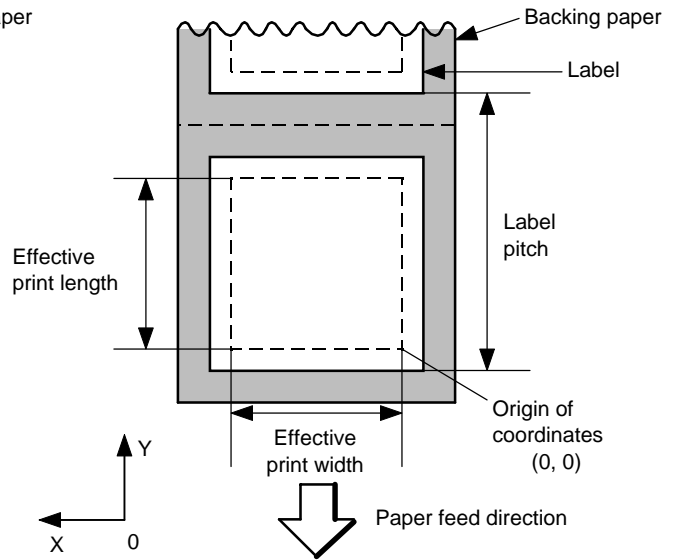
Function	Sets the size of a label or a tag.
Format	[ESC] Daaaa, bbbb, cccc [LF] [NUL]
Term	<p>aaaa: Pitch length of the label or the tag Fixed as 4 digits (in 0.1 mm units)</p> <p>bbbb: Effective print width Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Effective print length Fixed as 4 digits (in 0.1 mm units)</p>

Explanation

[In the case of labels]

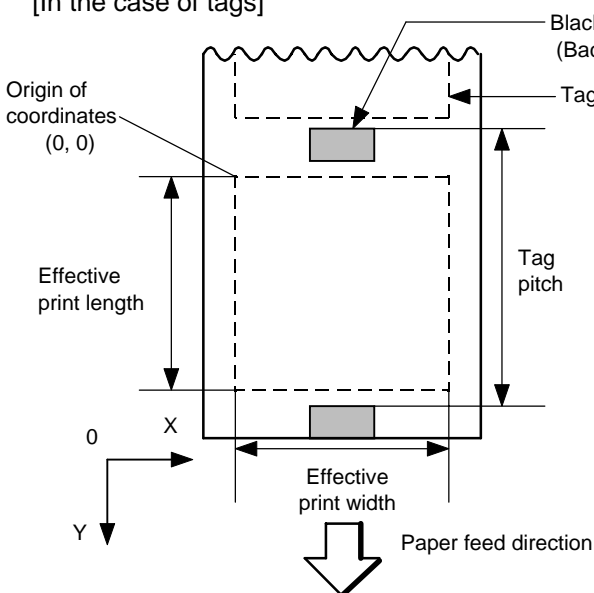


[Print direction: Printing bottom first]

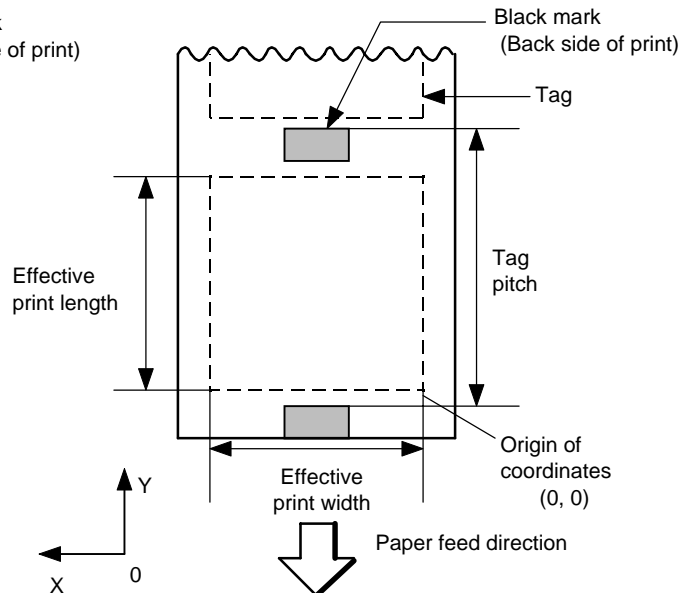


[Printing direction: Printing top first]

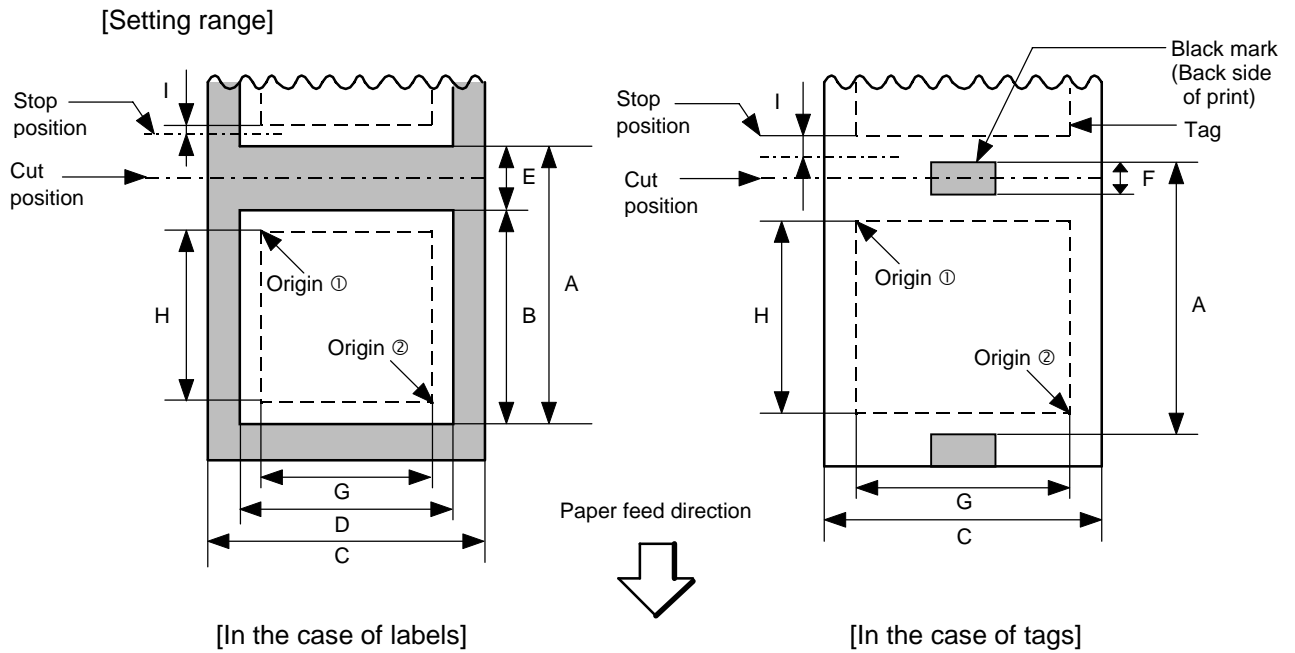
[In the case of tags]



[Print direction: Printing bottom first]



[Printing direction: Printing top first]



[mm]

Item		Model		B-472			
		Method		Batch	Strip	Cut	
A: Label pitch Tag pitch	Min.	Label		10.0	25.4	38.0	
		Tag		10.0	-	25.4	
	Max.		999.0				
B: Label length	Min.			8.0	23.4	25.0	
	Max.			997.0		993.0	
C: Backing paper width Tag width	Min.	50.8					
	Max.	112.0					
D: Label width	Min.	47.8					
	Max.	109.0					
E: Label-to-label gap	Min.	2.0			6.0		
	Max.	20.0					
F: Black mark length	Min.	2.0					
	Max.	10.0					
G: Effective print width	Min.	10.0					
	Max.	104.0					
H: Effective print length	Label	Min.		6.0	21.4	23.0	
		Max.	W/o expansion memory		384.0		
			W/expansion memory		896.0		
	Tag	Min.		8.0	23.4		
		Max.	W/o expansion memory		384.0		
			W/expansion memory		896.0		
I: Slow up interval		1.0					
Max. effective print length for on-the-fly issue	W/o expansion memory		192.0				
	W/expansion memory		448.0				

Remarks: 1. In cut issue mode, label length B should be as follows:

$$\text{Label length } B \geq 35.0 \text{ mm} - \left(\frac{\text{Label-to-label gap}}{2} \right)$$

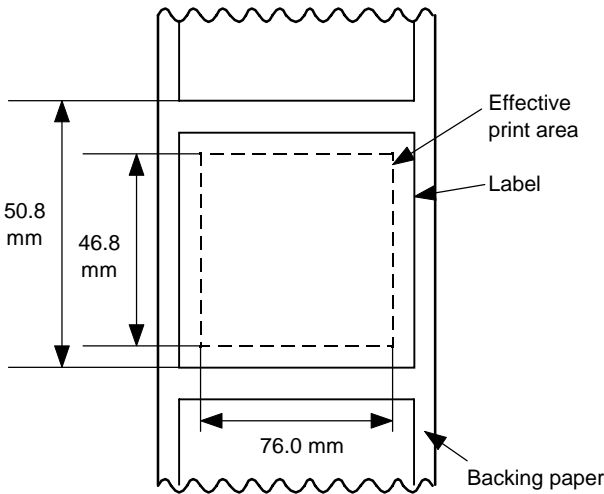
Notes

- (1) Before changing the label size or type of sensor, the Label Size Set Command must first be transmitted.
- (2) The Label Size Set Command is protected in memory (protected 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) and must be aligned with the first printing position prior to printing.
- (4) The origin of drawing coordinates, print stop position (head position at stop), and cut position are determined according to the parameters of the Label Size Set Command as shown in the figure on the preceding page. For the print stop position in strip issue mode, refer to the section of the Position Fine Adjust Command. The effective print area is centered on the label/tag.
- (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, print stop position (head position at stop), and cut position are adjustable by the Fine Adjust Commands and according to the fine adjustment settings in System mode.
- (7) The tag rotation designation of the Issue Command ([ESC] XS) causes the origin of drawing coordinates to be origin ① in the case of “printing bottom first” and to be origin ② in the case of “printing top first”, as shown in the figure.
- (8) The parameters must be as shown in the figure and table. Any value or paper outside the range results in a failure of printing or an error.
- (9) Where an effective print length within “max. effective print length for on-the-fly” is specified, labels even each with different data can be printed continuously without stopping every label 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 quantity of drawing data. Also, if the ribbon save issue is used, the On-the-fly issue will not be performed regardless of the data quantity.

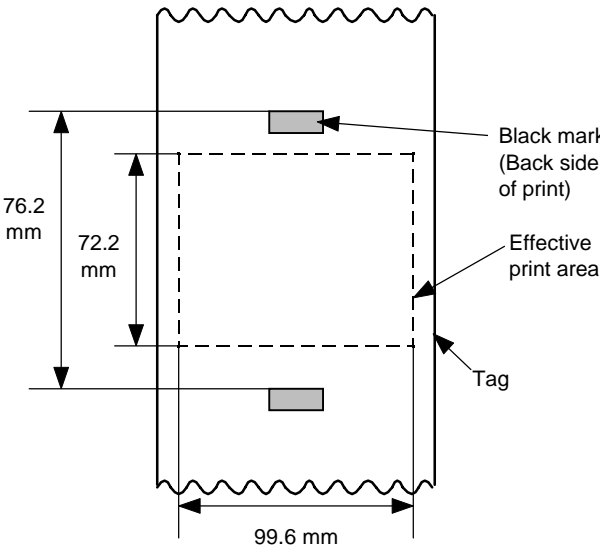
Examples

(1) In the case of labels



```
10 PRINT #1, ESC$; "D0508, 0760, 0468"; LF$; NUL$;
20 PRINT #1, ESC$; "T20C61"; LF$; NUL$;
```

(2) In the case of tags



```
10 PRINT #1, ESC$; "D0762, 0996, 0722"; LF$; NUL$;
20 PRINT #1, ESC$; "T10C61"; LF$; NUL$;
```

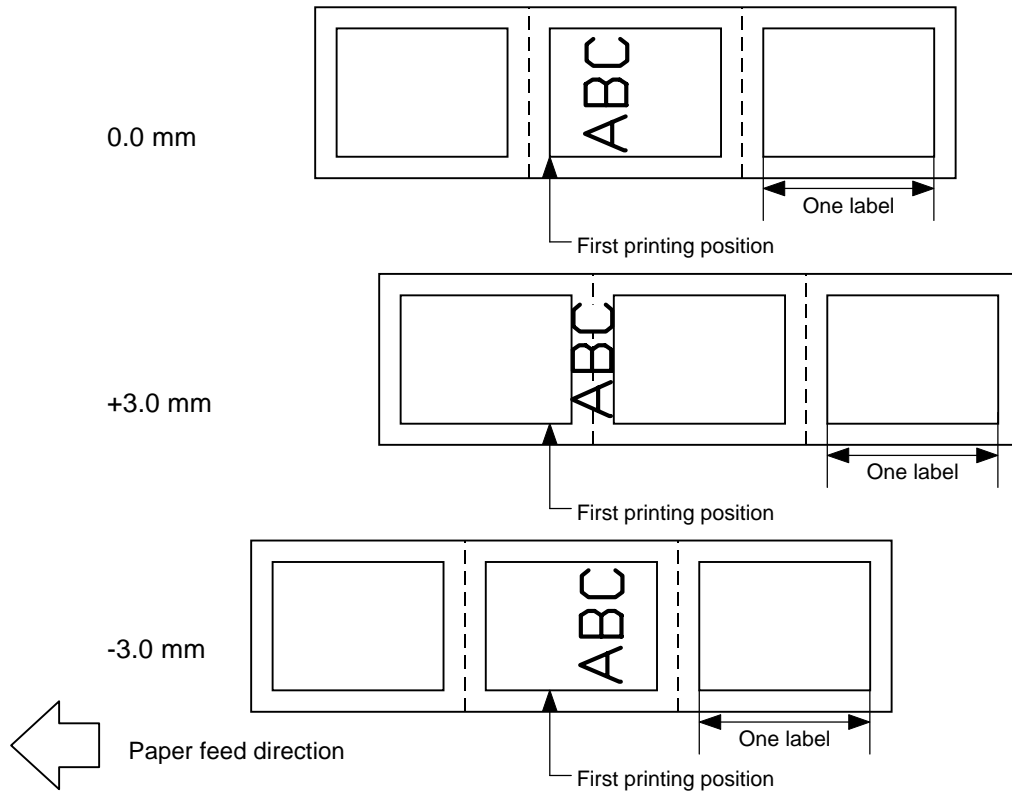
6.4 POSITION FINE ADJUST COMMAND

[ESC] AX

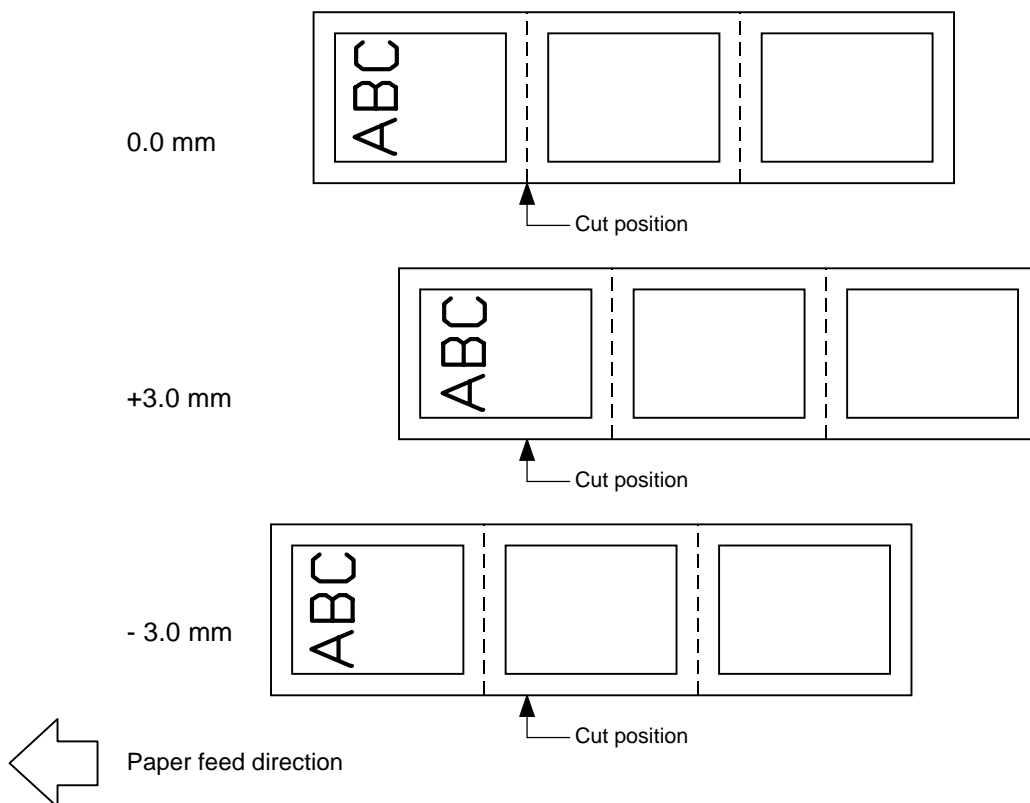
Function	Adjusts the feed value so that the label will be shifted forward or backward from the automatically set first printing position. Adjusts the cut position so that the label will be cut at a position shifted forward or backward from the automatically set cut position. Adjusts the value for feeding back the label to the home position after cutting. Adjusts the strip position so that the label will be shifted forward or backward from the automatically set strip position. Adjusts the value for feeding back the label to the home position after stripping.
Format	[ESC] AX; abbb, cddd, eff [LF] [NUL]
Term	a: Indicates the direction, forward or backward, in which a fine adjustment is to be made. + : Backward - : Forward bbb: Feed value to be finely adjusted 000 to 500 (in 0.1 mm units) c: Indicates the direction, forward or backward, in which a cut position (or strip position) fine adjustment is to be made. + : Backward - : Forward ddd: Amount for finely adjusting the cut position (or strip position) 000 to 500 (in 0.1 mm units) e: Indicates whether the back feed is to be increased or decreased. + : Increase - : Decrease ff: Amount for finely adjusting the back feed 00 to 99 (in 0.1 mm units)

Explanation

[Feed Length Fine Adjustment] (To finely adjust the feed for shifting backward or forward)

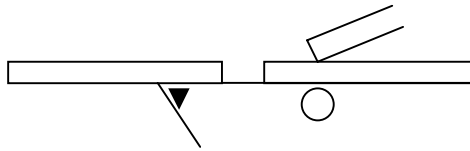


[Cut Position Fine Adjustment] (To finely adjust the cut position for shifting backward or forward)

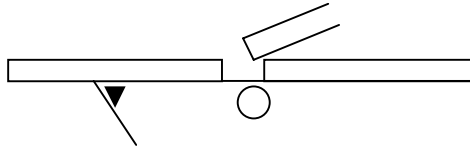


[Strip Position Fine Adjustment]

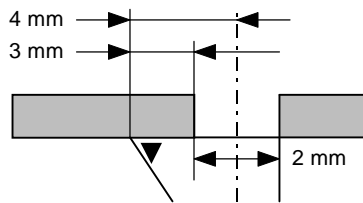
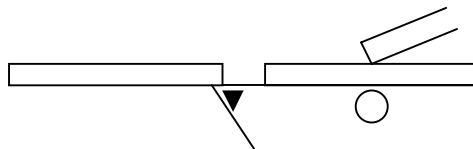
0.0 mm



+3.0 mm



-3.0 mm



Printing in strip issue mode is stopped at the position where the distance from the middle point of the label-to-label gap to the top of the strip shaft is 4 mm, since the label-to-label gap is assumed to be 2 mm.

When the print stop position is not proper, the print stop position should be adjusted using the strip position fine adjust function. When the label-to-label gap is 5 mm or more, the effective print length should be set to the maximum (label pitch -2 mm). Then, the print stop position should be adjusted using the strip position fine adjust function.

[Back Feed Fine Adjustment] (To finely adjust the back feed for shifting backward or forward)

0.0 mm



First printing position (home position after back feed)

+3.0 mm

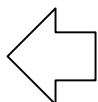


First printing position (home position after back feed)

- 3.0 mm



First printing position (home position after back feed)



Paper feed direction

- (1) If the feed value fine adjustment, cut position (or strip position) fine adjustment or back feed value fine adjustment has been set in system mode (key operation on the printer), the fine adjustment value will be the fine adjustment in system mode. The max. fine adjustment values are as follows. However, the max. feed fine adjustment value is limited within the label pitch.

Feed value fine adjustment±50.0 mm
Cut position (or strip position) fine adjustment±50.0 mm
Back feed value fine adjustment±9.9 mm

- (2) After changing the fine adjustment value by this command, one label must be fed by the Feed Command ([ESC] T) to adjust the first printing position.
- (3) Each fine adjustment value is protected in memory (protected even if the power is turned off).
- (4) If a fine adjustment value is improper, printing will not be performed correctly.

(For example, if the back feed fine adjustment value is not set properly, the printing positions without cutting and after cutting will be different from each other. If the label is fed back excessively, the paper will not be fed correctly during printing.
In the strip issue mode, the print position of the 1st label may be different from that of the 2nd label. The back feed adjustment is performed in order that the label is correctly fed back to the position placed before the forward feed is performed.

- (5) The cut position (or the strip position) fine adjustment and back feed value fine adjustment are effective only when the printer is in cut issue or strip issue mode.
- (6) Procedure for Label Having Label Pitch of Less than 38 mm

[Method 1]

When the following conditions are all met, the paper ejection operation in cut print mode is as follows.

Head lifted → Forward feed to the cut position → Head lowered → Cut → Head lifted → Reverse feed to the home position → Head lowered

Conditions:

Issue Command, Feed Command, and Eject Command received.
Label pitch of 38.0 mm or less, cut performed, transmissive sensor, cut position fine adjustment of ±10.0 mm or less, and issue mode "C"

* The head is lifted/lowered only when the optional ribbon save module (B-4905-R-QM) is attached. When the ribbon save module is not installed, use Method 2 since the head is not lifted/lowered.

[Method 2]

The minimum label pitch of the label which can be cut in normal use is 38.0 mm. When a label having a label pitch of less than 38 mm is used, the edge of the label is caught by the edge of the thermal head during a backfeed to the home position after cutting the gap area between labels. Therefore, the label may not be fed back to the proper home position.

By performing the cut position fine adjustment according to the following procedure, the above problem will be solved. However, when this procedure is used, one or more printed labels are left between the head and the cutter. Therefore, the left labels should be removed by an issue or feed of a label.

(a) Cut Position Fine Adjustment Value Calculation

The cut position fine adjustment value can be calculated using the following method. Even if a back feed to the proper home position is not performed using this value, the cut position should be adjusted with a desired value.

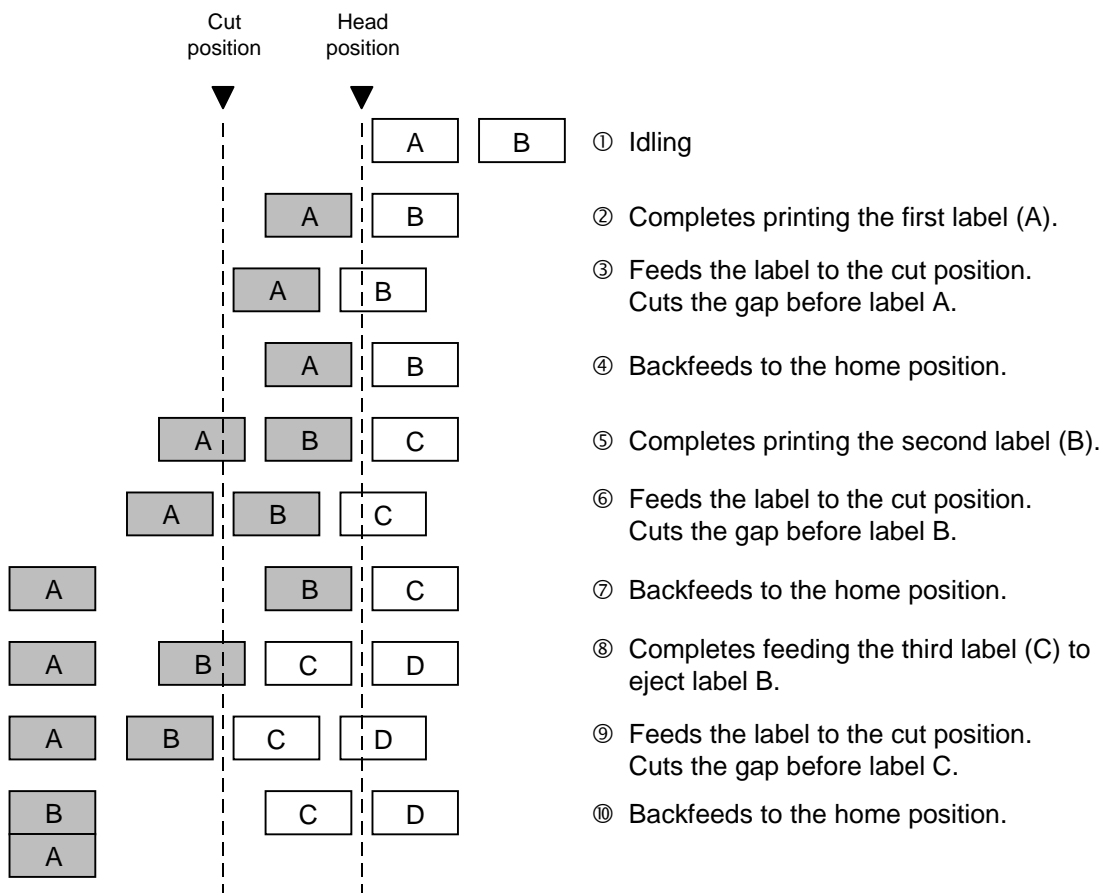
$$\begin{aligned} \text{Cut position fine adjustment value} &= (\text{Number of labels left between head and cutter}) \times (\text{Label pitch}) \\ &= \left(\frac{32.8 \text{ mm}}{\text{Label Pitch}} \right) \times (\text{Label pitch}) \end{aligned}$$

* Decimals of the result of the division is omitted.

Ex) Label pitch: 30.0 mm

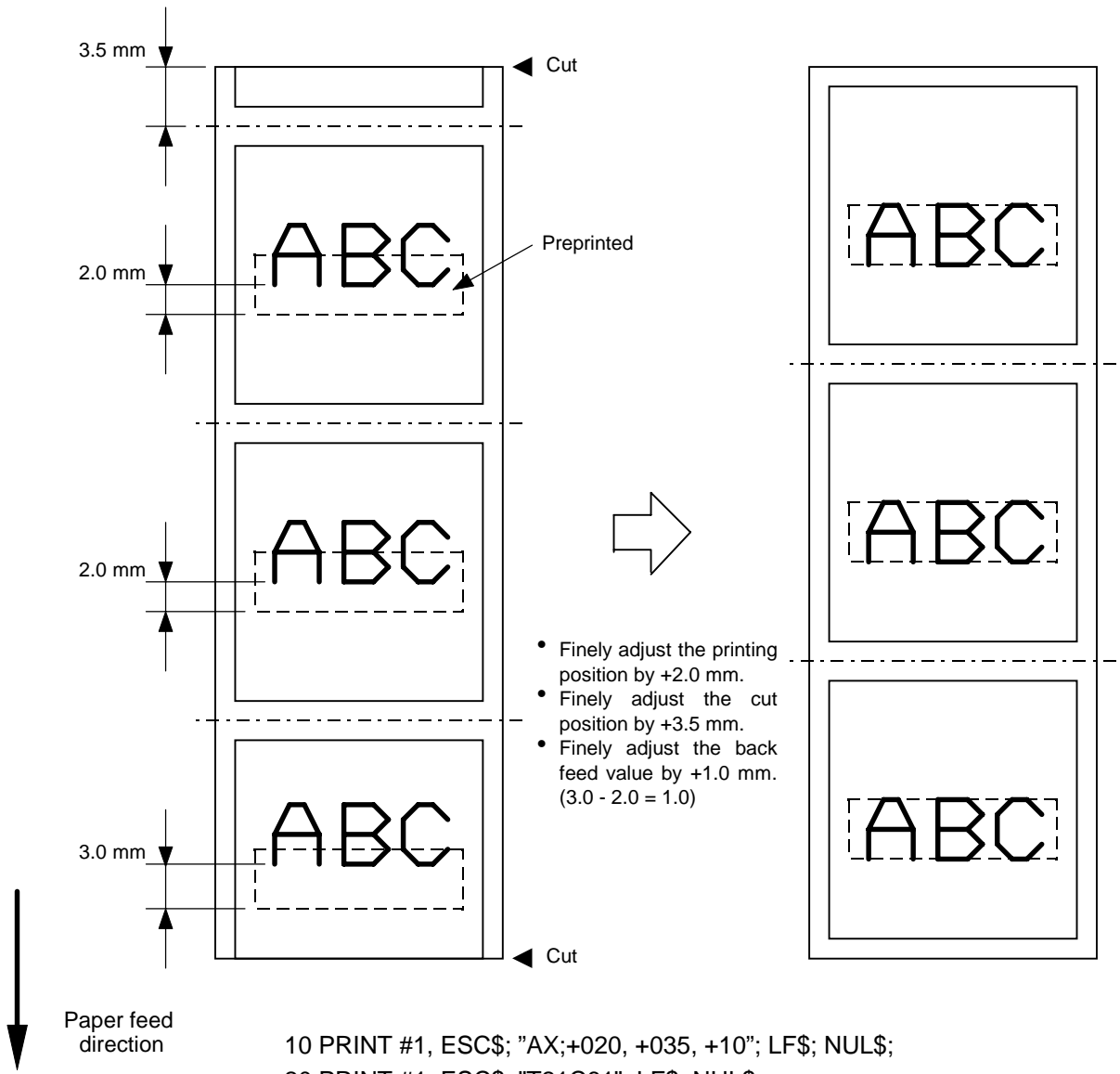
$$\begin{aligned} \text{Cut position fine adjustment value} &= \left(\frac{32.8 \text{ mm}}{30.0 \text{ mm}} \right) \times (30.0 \text{ mm}) \\ &= 1 \times 30.0 \text{ mm} \\ &= +30.0 \text{ mm} \end{aligned}$$

(b) Operation Example



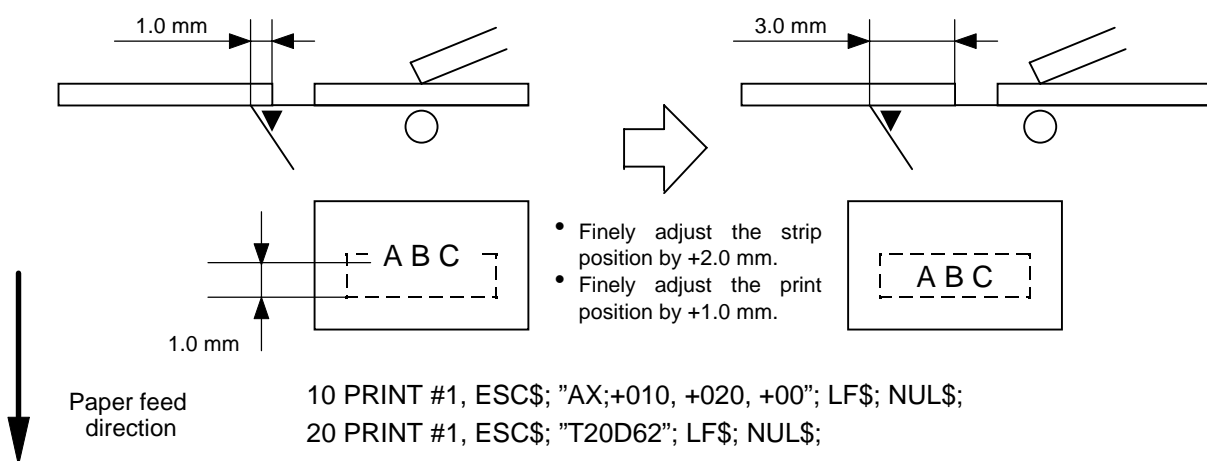
Examples

(1) Cut issue



```
10 PRINT #1, ESC$;"AX;+020, +035, +10"; LF$; NUL$;
20 PRINT #1, ESC$;"T21C61"; LF$; NUL$;
```

(2) Strip issue



```
10 PRINT #1, ESC$;"AX;+010, +020, +00"; LF$; NUL$;
20 PRINT #1, ESC$;"T20D62"; LF$; NUL$;
```

6.5 PRINT DENSITY FINE ADJUST COMMAND

[ESC] AY

Function	Adjusts the automatically set print density.
Format	[ESC] AY; abb, c [LF] [NUL]
Term	a: Indicates whether to increase or decrease the density. + : Increase (darker) - : Decrease (lighter) bb: Print density fine adjustment value 00 to 10 (in units of 1 step) c: Indicates the mode for fine adjustment, thermal transfer or direct thermal. 0: Thermal transfer 1: Direct thermal

Explanation	<p>(1) If the print density fine adjustment value has been set in system mode (key operation on the printer), the fine adjustment value will be the sum of the fine adjustment by this command and the fine adjustment in system mode. The respective max. fine adjustment values each are ± 10.</p> <p>(2) The fine adjustment values in thermal transfer mode and direct thermal mode can be set independently.</p> <p>(3) The Print Density Fine Adjust Command is protected in memory (protected even if the power is turned off).</p> <p>(4) The fine adjustment value for both fine adjust command and system mode fine adjustment is 00 at shipment from the factory.</p> <p>(5) The max. value for each print speed is as follows. When the value exceeds the maximum, it is automatically corrected to the max. value, and then the printer prints.</p> <p>3"/sec: +10 step 6"/sec: +5 step 10"/sec: +2 step</p>
-------------	--

Examples	<p>To set the density in thermal transfer mode to +3, and the density in direct thermal mode to -2.</p> <p>10 PRINT #1, ESC\$; "AY; +03, 0"; LF\$; NUL\$; 20 PRINT #1, ESC\$; "AY; -02, 1"; LF\$; NUL\$;</p>
----------	--

6.6 RIBBON MOTOR DRIVE VOLTAGE FINE ADJUST COMMAND [ESC] RM

Function	Adjusts the voltage of the ribbon motor.
Format	[ESC] RM; abbcdd [LF] [NUL]
Term	a: Fine adjustment direction of the ribbon rewind motor -: Negative (The voltage is lowered.) bb: Fine adjustment value for the ribbon rewind motor 00 to 15 (in units of 1 step) c: Fine adjustment direction of the ribbon back tension motor -: Negative (The voltage is lowered.) dd: Fine adjustment value for the ribbon back tension motor 00 to 15 (in units of 1 step)
Explanation	(1) -1 step corresponds to -5% of the standard voltage. (2) The ribbon motor drive voltage fine adjustment value is protected in memory (even if the power is turned off). (3) If the ribbon motor drive voltage fine adjustment value has been set in the system mode (key operation on the printer), the fine adjustment value will be the sum of the system mode and the ribbon rewind motor adjustments or the system mode and the ribbon back tension motor adjustments. The respective max. fine adjustment values each are -15. (4) When the RAM clear is performed, the fine adjustment values for both fine adjust commands (rewind and back tension) and the system mode are 00. (5) The fine adjustment values for both fine adjust commands (rewind and back tension) and the system mode are 00 at time of shipping from the factory.
Example	To set the value for the ribbon rewind motor to -3, and the value for the ribbon back tension motor to -2. 10 PRINT #1, ESC\$; "RM; -03-02"; LF\$; NUL\$;

6.7 IMAGE BUFFER CLEAR COMMAND

[ESC] C

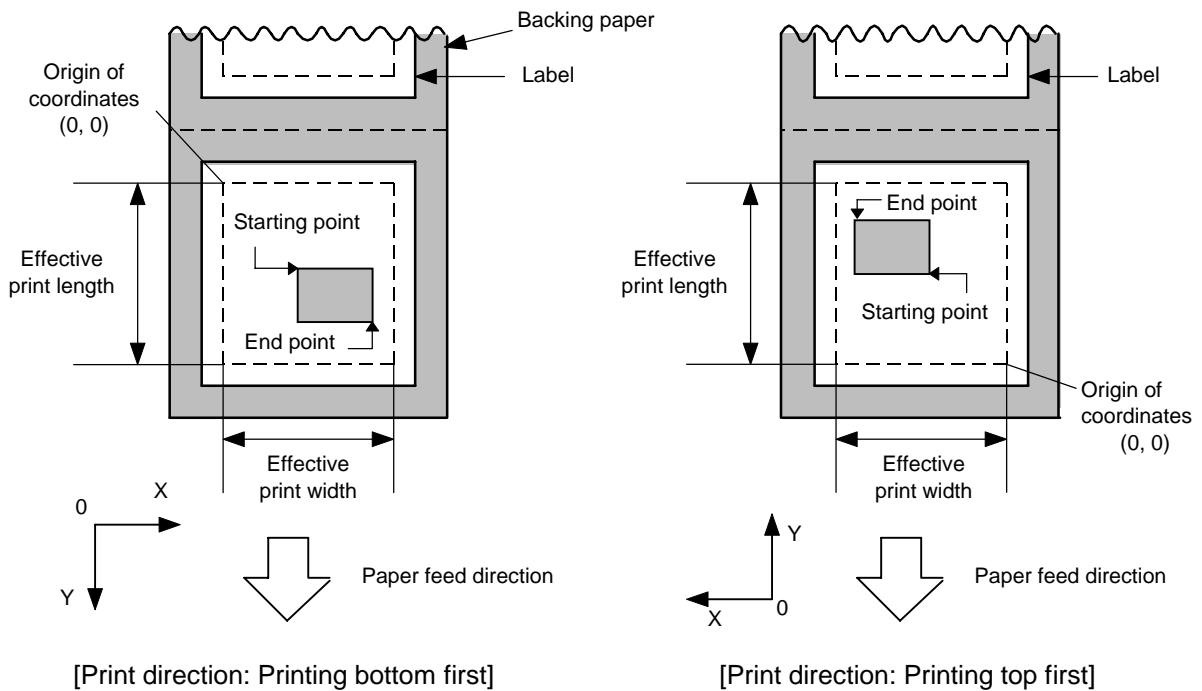
Function	Clears the image buffer for drawing characters, lines, bar codes, and graphics.
Format	[ESC] C [LF] [NUL]
Explanation	<ol style="list-style-type: none">(1) After changing the label size, the image buffer must be cleared.(2) The increment/decrement designation is valid until the Image Buffer Clear Command is transmitted.(3) The link field designation is effective until the Image Buffer Clear Command is sent.
Examples	<pre>10 PRINT #1, ESC\$; "C"; LF\$; NUL\$; 20 PRINT #1, ESC\$; "RC000; ABC"; LF\$; NUL\$; 30 PRINT #1, ESC\$; "RC001; DEF"; LF\$; NUL\$; 40 PRINT #1, ESC\$; "XS; I, 0001, 0002C6100"; LF\$; NUL\$;</pre>

6.8 CLEAR AREA COMMAND

[ESC] XR

Function	Clears the designated area or reverse 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: Designated area start point X-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>bbbb: Designated area start point Y-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Designated area end point X-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>dddd: Designated area end point Y-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>e: Type of clear A: Clears the contents in the designated area to zeros. B: Reverses the white/black dot pattern in the designated area.</p>

Explanation



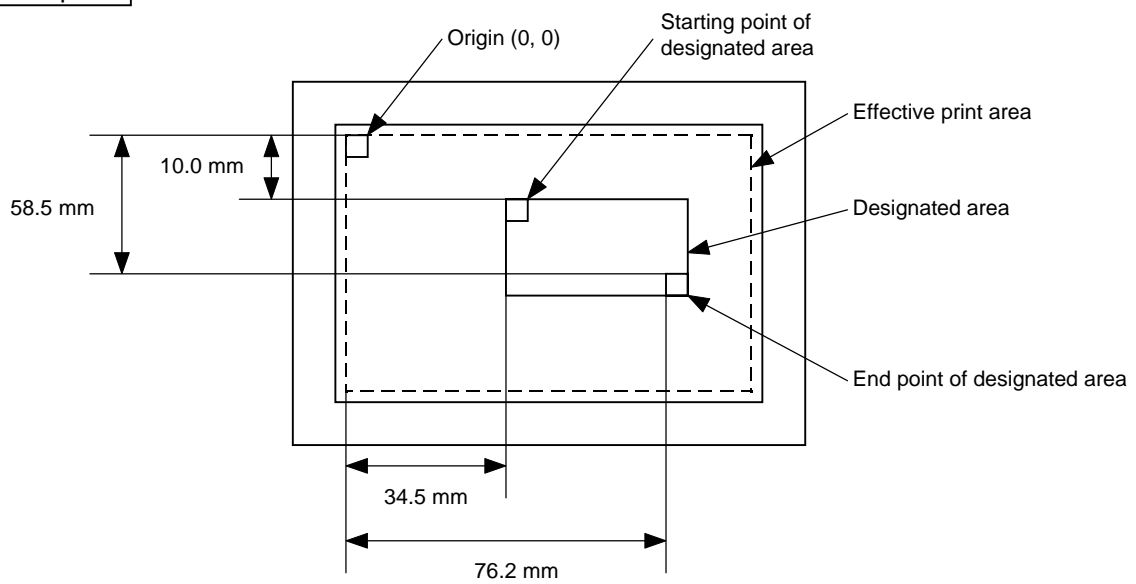
Notes	<ol style="list-style-type: none"> (1) The result is the same even if the start and end point coordinates are reversed. (2) The result is the same even if the start and end point coordinates are set to an upper right and a lower left points, respectively. (3) The start and end coordinates of the designated area must be set within the effective print area set by the Label Size Set Command ([ESC] D).
-------	--

[Effective print area]

[mm]

Item		Model		B-472			
		Method		Batch	Strip	Cut	
Effective print width		Min.		10.0			
		Max.		104.0			
Effective print length	Label	Min.		6.0	21.4	23.0	
		Max.	W/o expansion memory		384.0		
			W/expansion memory		896.0		
	Tag	Min.		8.0	23.4		
		Max.	W/o expansion memory		384.0		
			W/expansion memory		896.0		

Examples



```

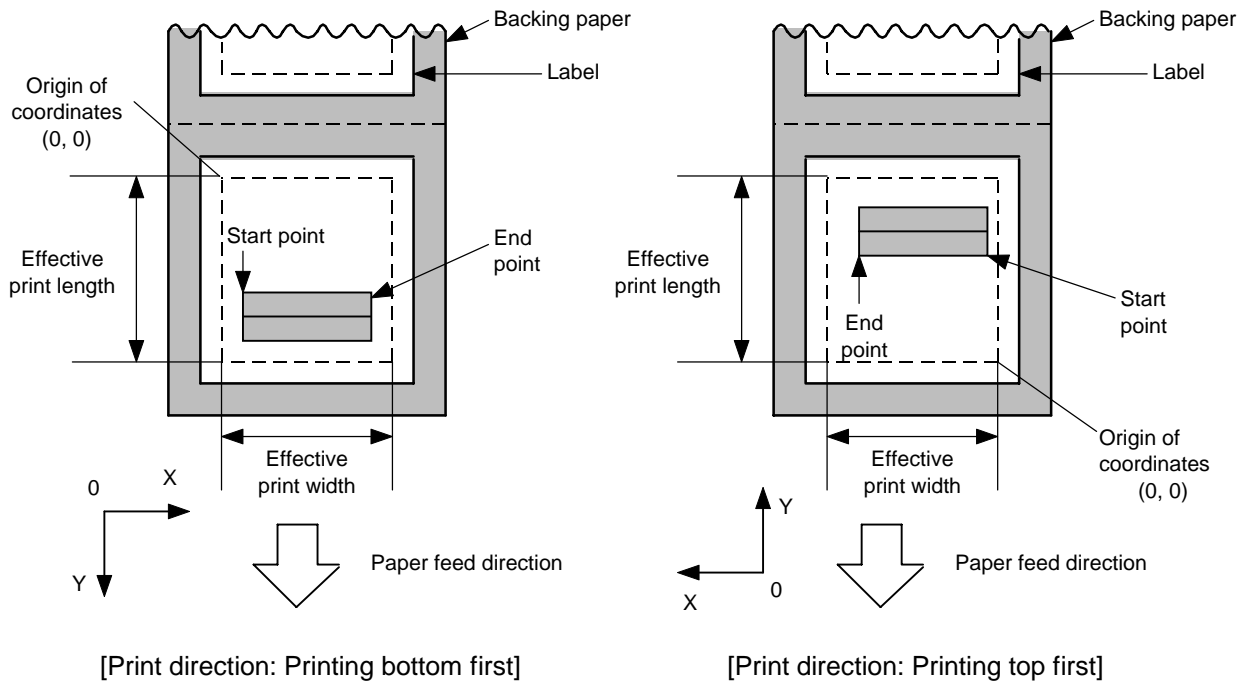
10 PRINT # , ESC$; "XR; 0345, 0100, 0762, 0585, A"; LF$; NUL$;
20 PRINT #1, ESC$; "RC000; ABC"; LF$; NUL$;
30 PRINT #1, ESC$; "RC001; DEF"; LF$; NUL$;
40 PRINT #1, ESC$; "XS; I, 0001, 0002C6000"; LF$; NUL$;
    
```

6.9 LINE FORMAT COMMAND

[ESC] LC

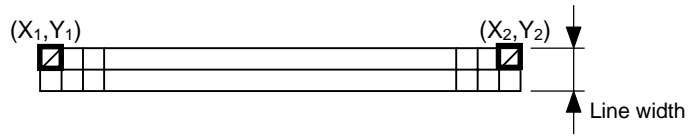
Function	Sets the line format and draws the line.
Format	[ESC] LC; aaaa, bbbb, cccc, dddd, e, f [,ggg] [LF] [NUL]
Term	<p>aaaa: Start point X-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>bbbb: Start point Y-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: End point X-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>dddd: End point Y-coordinate Fixed as 4 digits (in 0.1 mm units)</p> <p>e: Type of line 0: Line (horizontal, vertical line, slant line) 1: Rectangle</p> <p>f: No. of line width dots 1 to 9 (in 0.1 mm units)</p> <p>ggg: Radius of rounded corners of a rectangle (omissible) Fixed as 3 digits (in 0.1 mm units)</p>

Explanation

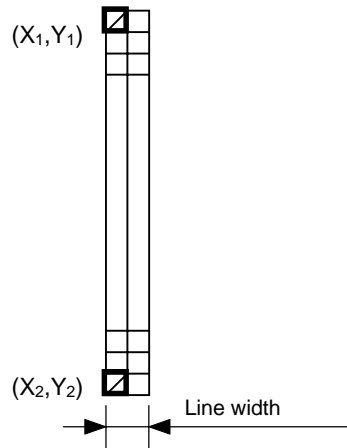


[Line]

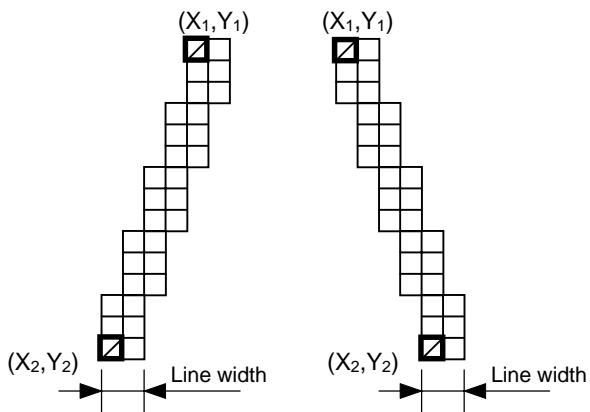
- (1) Horizontal line (In the case of $|Y_2 - Y_1| = 0$)



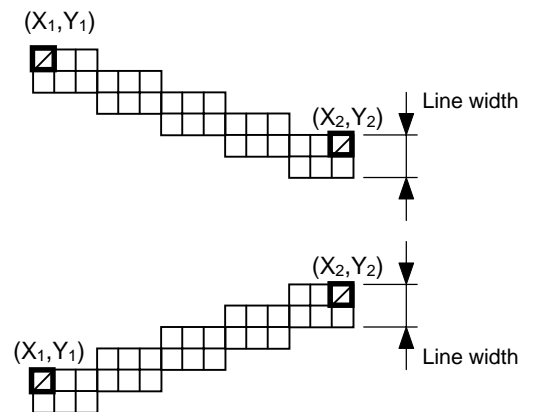
- (2) Vertical line (In the case of $|X_2 - X_1| = 0$)



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

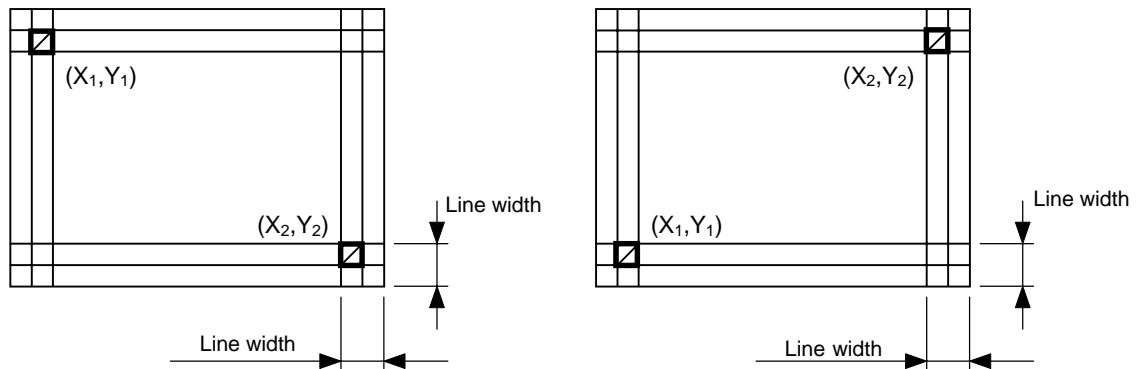


- (4) Slant line B ($|X_2 - X_1| > |Y_2 - Y_1|$)

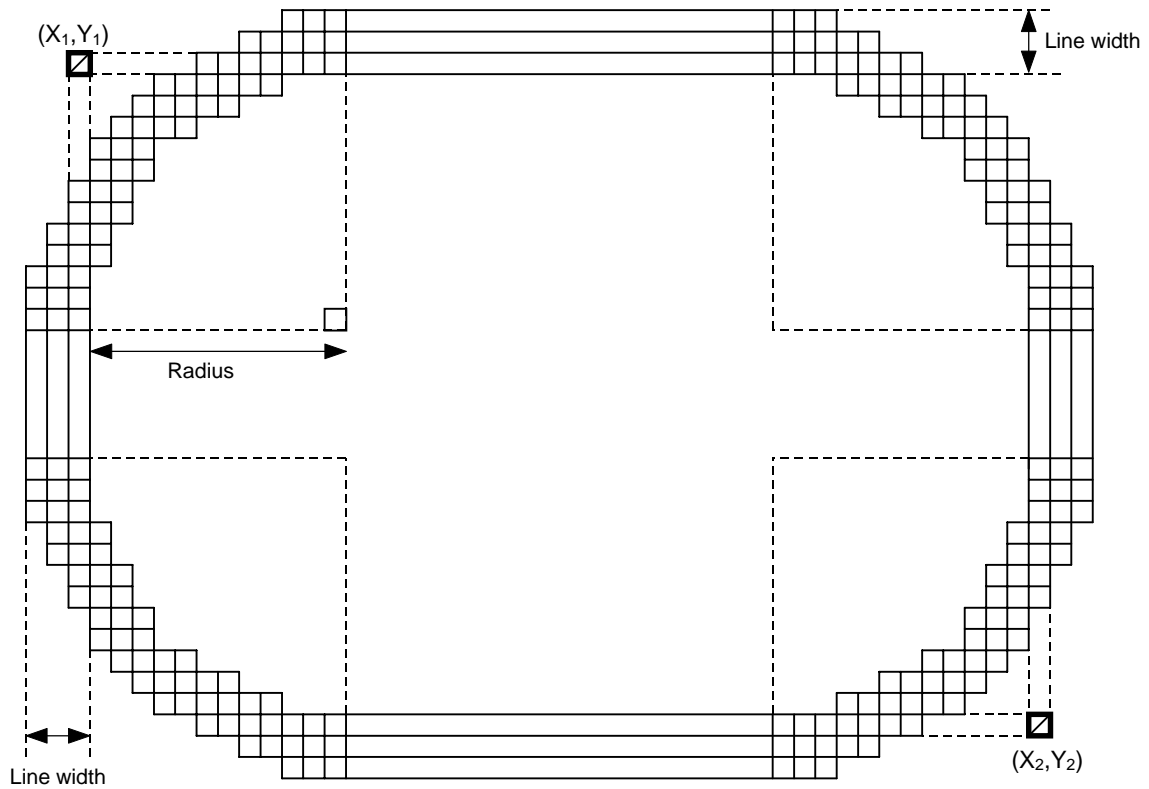


[Rectangle]

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



(2) Radius of rounded corners \neq 000



Notes

- (1) In line designation, a horizontal line, vertical line or slant line A/B is drawn according to the start and end point coordinates.
- (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).

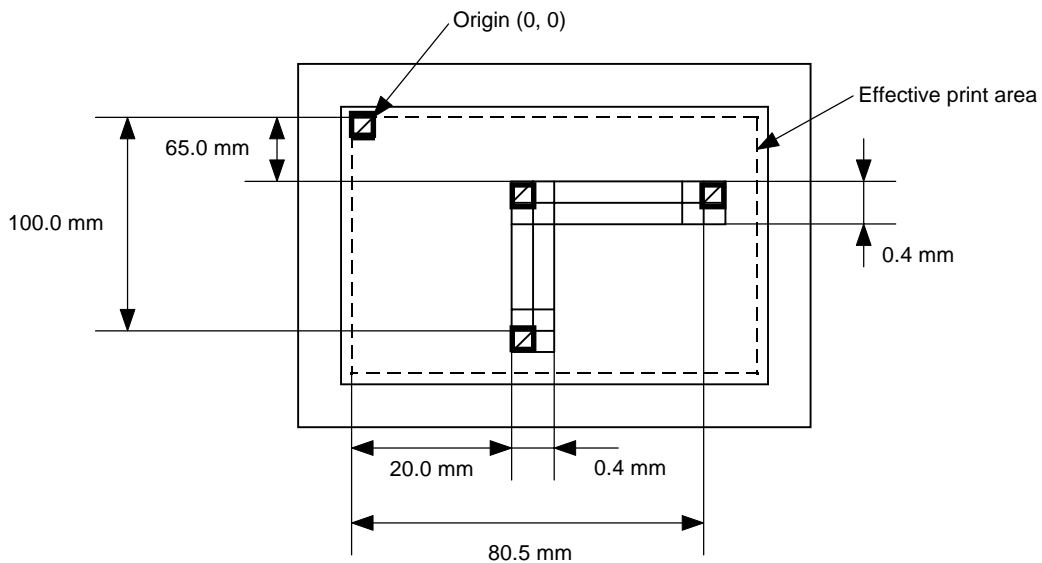
- (4) Programming the radius of the rounded corner is effective only when the type of line is 1 (Rectangle). When the type of line is 0, designation of the radius is ignored.
When the type of line is 1, and the radius of the rounded corner is 000 or omitted, a rectangle is printed.

- (5) A circle is assumed when:

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

[Effective print area]		[mm]			
Item	Model		B-472		
	Method	Batch	Strip	Cut	
Effective print width	Min.		10.0		
	Max.		104.0		
Effective print length	Label	Min.		6.0 21.4 23.0	
		Max.	W/o expansion memory		384.0
			W/expansion memory		896.0
	Tag	Min.		8.0 23.4	
		Max.	W/o expansion memory		384.0
			W/expansion memory		896.0

Examples



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "LC; 0200, 0650, 0805, 0650, 0, 4"; LF$; NUL$;
30 PRINT #1, ESC$; "LC; 0200, 0650, 0200, 1000, 0, 4"; LF$; NUL$;
40 PRINT #1, ESC$; "XS; I, 0001, 0002C6000"; LF$; NUL$;

```

6.10 BIT MAP FONT FORMAT COMMAND

[ESC] PC

Function	Sets the format indicating on the label at which the bit map font is to be printed and how it is to be printed.																																																												
Format	<p>① [ESC] PCaaa; bbbb, cccc, d, e, ff (, gh), ii, j (, Jkkll) (, Mm) (, noooooooooo) (, Zpp) (, Pq) (=rrr-----rrr) [LF] [NUL]</p> <p>② [ESC] PCaaa; bbbb, cccc, d, e, ff (, gh), ii, j (, Jkkll) (, Mm) (, noooooooooo) (, Zpp) (, Pq) (; ss₁, ss₂, ss₃, -----, ss₂₀) [LF] [NUL]</p>																																																												
Term	<p>aaa: Character string number 000 to 199 (two digits, 00 to 99, also acceptable)</p> <p>bbbb: Print origin of X-coordinate of character string Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of character string Fixed as 4 digits (in 0.1 mm units)</p> <p>d: Character horizontal magnification 1 to 9 (in magnifications) * Two digit designation enables magnifications in 0.5 units (05 ~ 95: 0.5 to 9.5 magnifications).</p> <p style="margin-left: 20px;">d d └─┬─┘ Designation in 0.5 magnification units 0 or 5 └───┘ Designation in magnifications 0 to 9</p> <p>e: Character vertical magnification 1 to 9 (in magnifications) * Two digit designation enables magnifications in 0.5 units (05 ~ 95: 0.5 to 9.5 magnifications).</p> <p style="margin-left: 20px;">e e └─┬─┘ Designation in 0.5 magnification units 0 or 5 └───┘ Designation in magnifications 0 to 9</p> <p>ff: Type of font</p> <table style="margin-left: 20px; border-collapse: collapse;"> <tr><td>A: Times Roman</td><td>(Medium)</td><td>12 point</td></tr> <tr><td>B: Times Roman</td><td>(Medium)</td><td>15 point</td></tr> <tr><td>C: Times Roman</td><td>(Bold)</td><td>15 point</td></tr> <tr><td>D: Times Roman</td><td>(Bold)</td><td>18 point</td></tr> <tr><td>E: Times Roman</td><td>(Bold)</td><td>21 point</td></tr> <tr><td>F: Times Roman</td><td>(Italic)</td><td>18 point</td></tr> <tr><td>G: Helvetica</td><td>(Medium)</td><td>9 point</td></tr> <tr><td>H: Helvetica</td><td>(Medium)</td><td>15 point</td></tr> <tr><td>I: Helvetica</td><td>(Medium)</td><td>18 point</td></tr> <tr><td>J: Helvetica</td><td>(Bold)</td><td>18 point</td></tr> <tr><td>K: Helvetica</td><td>(Bold)</td><td>21 point</td></tr> <tr><td>L: Helvetica</td><td>(Italic)</td><td>18 point</td></tr> <tr><td>M: Presentation</td><td>(Bold)</td><td>27 point</td></tr> <tr><td>N: Letter Gothic</td><td>(Medium)</td><td>14.3 point</td></tr> <tr><td>O: Prestige Elite</td><td>(Medium)</td><td>10.5 point</td></tr> <tr><td>P: Prestige Elite</td><td>(Bold)</td><td>15 point</td></tr> <tr><td>Q: Courier</td><td>(Medium)</td><td>15 point</td></tr> <tr><td>R: Courier</td><td>(Bold)</td><td>18 point</td></tr> <tr><td>S: OCR-A</td><td></td><td>12 point</td></tr> <tr><td>T: OCR-B</td><td></td><td>12 point</td></tr> </table>	A: Times Roman	(Medium)	12 point	B: Times Roman	(Medium)	15 point	C: Times Roman	(Bold)	15 point	D: Times Roman	(Bold)	18 point	E: Times Roman	(Bold)	21 point	F: Times Roman	(Italic)	18 point	G: Helvetica	(Medium)	9 point	H: Helvetica	(Medium)	15 point	I: Helvetica	(Medium)	18 point	J: Helvetica	(Bold)	18 point	K: Helvetica	(Bold)	21 point	L: Helvetica	(Italic)	18 point	M: Presentation	(Bold)	27 point	N: Letter Gothic	(Medium)	14.3 point	O: Prestige Elite	(Medium)	10.5 point	P: Prestige Elite	(Bold)	15 point	Q: Courier	(Medium)	15 point	R: Courier	(Bold)	18 point	S: OCR-A		12 point	T: OCR-B		12 point
A: Times Roman	(Medium)	12 point																																																											
B: Times Roman	(Medium)	15 point																																																											
C: Times Roman	(Bold)	15 point																																																											
D: Times Roman	(Bold)	18 point																																																											
E: Times Roman	(Bold)	21 point																																																											
F: Times Roman	(Italic)	18 point																																																											
G: Helvetica	(Medium)	9 point																																																											
H: Helvetica	(Medium)	15 point																																																											
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N: Letter Gothic	(Medium)	14.3 point																																																											
O: Prestige Elite	(Medium)	10.5 point																																																											
P: Prestige Elite	(Bold)	15 point																																																											
Q: Courier	(Medium)	15 point																																																											
R: Courier	(Bold)	18 point																																																											
S: OCR-A		12 point																																																											
T: OCR-B		12 point																																																											

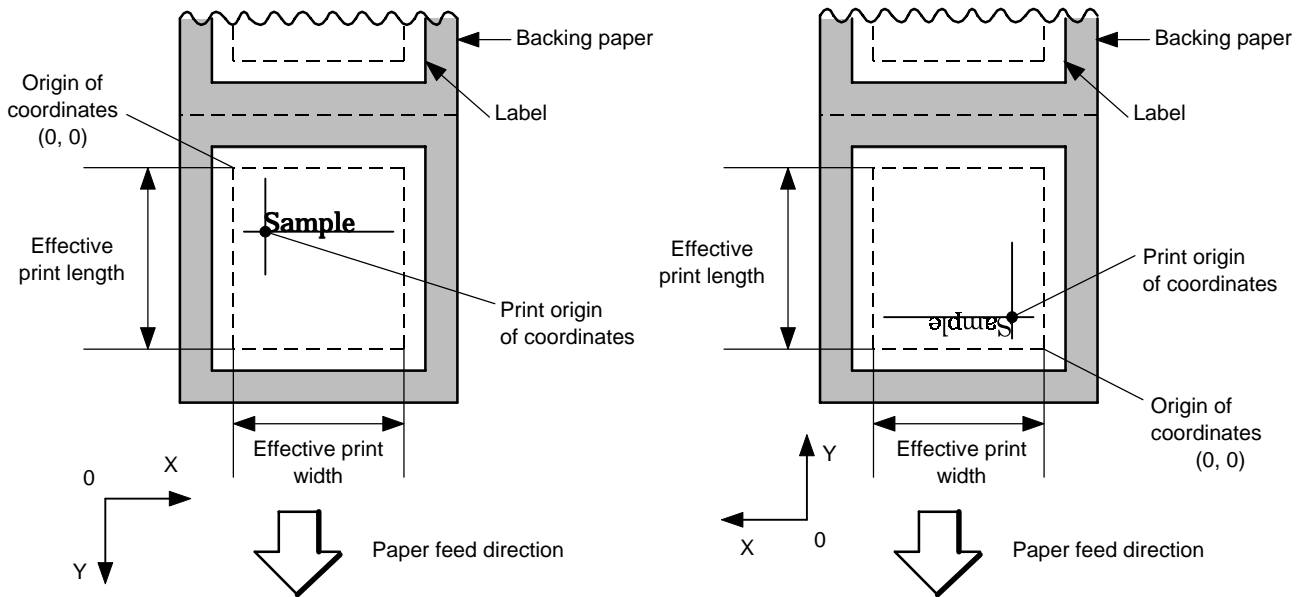
- 01: Writable character 1 (1×1 to 720×720 dots)
to
40: Writable character 40 (1×1 to 720×720 dots)
- * The following fonts are proportional.
A, B, C, D, E, F, G, H, I, J, K, L
- ghh: Fine adjustment of character-to-character space (omissible)
g: Designates whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease
hh: No. of space dots between characters
00 to 99 (in 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)
- j: Selection of a black character or reverse character
B: Black character
W: Reverse character
- Jkkl: Bold character designation (omissible)
kk: No. of horizontal shift dots
00 to 16 (in dots)
ll: No. of vertical shift dots
00 to 16 (in dots)
- Mm: Type of the check digit to be attached (omissible)
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)
- nooooooooo: Increment and decrement (omissible)
n: Designates whether to increment or decrement.
+: Increment
-: Decrement
oooooooo: Skip value
000000000 to 999999999
- Zpp: Zero suppression (omissible)
pp: No. of zeros to be suppressed
00 to 20
- Pq: Alignment (omissible)
q: Designates the character position.
1: Left
2: Center
3: Right
* If omitted, the alignment is set to left.
- 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 be also 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: Printing bottom first]

[Printing direction: Printing top first]

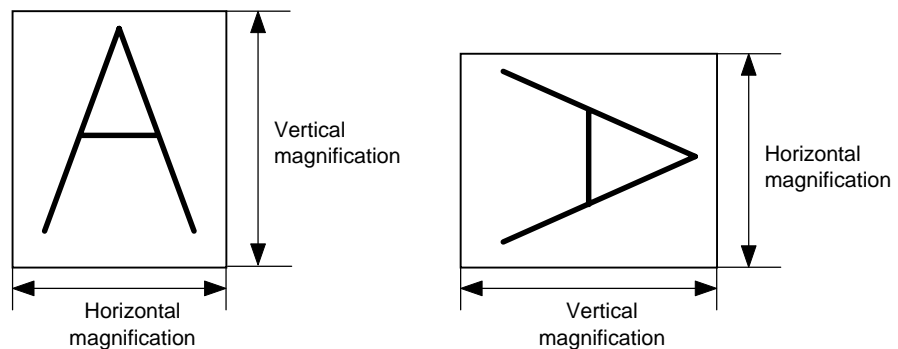
The print origin of coordinates must be set so that the result of character drawing will be within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area]

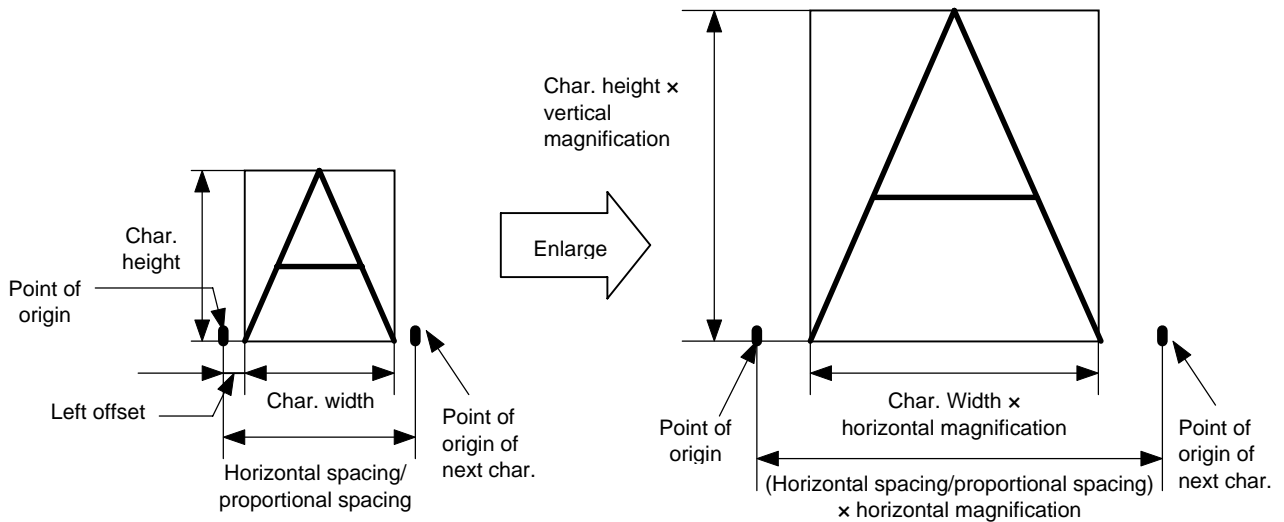
[mm]

Item		Model		B-472		
		Method		Batch	Strip	Cut
Effective print width		Min.		10.0		
		Max.		104.0		
Effective print length	Label	Min.		6.0	21.4	23.0
		Max.	W/o expansion memory		384.0	
			W/expansion memory		896.0	
	Tag	Min.		8.0	23.4	
		Max.	W/o expansion memory		384.0	
			W/expansion memory		896.0	

(3) Horizontal magnification and vertical magnification



[Relationship between drawing coordinates and magnification]

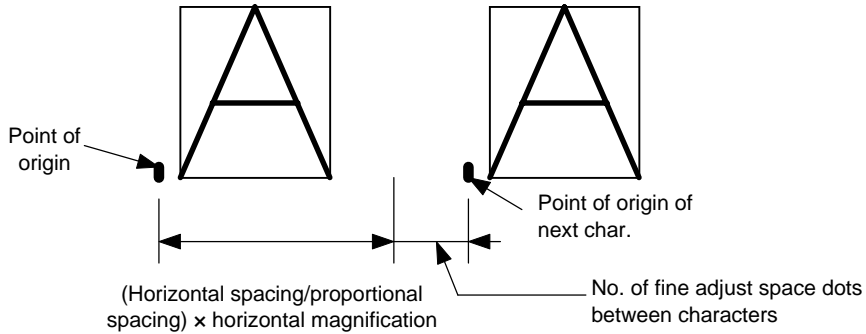


(4) Type of font

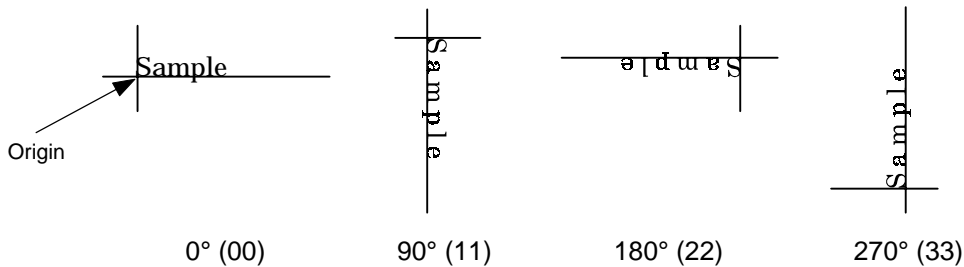
- A: Times Roman: `!"#$%&'()*+,-./0123456789;=<=>?@ABCDEFG`
- B: Times Roman: `!"#$%&'()*+,-./0123456789;=<=>?@ABC`
- C: Times Roman: `!"#$%&'()*+,-./0123456789;=<=>?@AB`
- D: Times Roman: `!"#$%&'()*+,-./0123456789@ABC`
- E: Times Roman: `!"#$%&0123456789@ABCDEF`
- F: Times Roman: `!"#$%&'()*+,-./0123456789@ABC`
- G: Helvetica: `!"#$%&'()*+,-./0123456789;=<=>?@ABCDEFGHIJKLMNOPQRST`
- H: Helvetica: `!"#$%&'()*+,-./0123456789;=<=>?@ABC`
- I: Helvetica: `!"#$%&'()*+,-./0123456789@ABC`
- J: Helvetica: `!"#$%&'()*+,-./0123456789@ABC`
- K: Helvetica: `!"#$%&0123456789@ABCD`
- L: Helvetica: `!"#$%&'()*+,-./0123456789@ABC`
- M: Presentation: **`!"#$%&0123456789@`**
- N: Letter Gothic: `!"#$%&'()*+,-./0123456789;=<=>?@ABCDEFGHIJK`
- O: Prestige Elite: `!"#$%&'()*+,-./0123456789;=<=>?@ABCDEFGHIJK`
- P: Prestige Elite: **`!"#$%&'()*+,-./0123456789;=<=>?`**
- Q: Courier: `!"#$%&'()*+,-./0123456789;=<=>?`
- R: Courier: **`!"#$%&'()*+,-./0123456789@`**
- S: OCR-A: `"$+-./0123456789<>ABCDEFGHIJKLMN0PQRSTU`
- T: OCR-B: `"$+-./0123456789<>ABCDEFGHIJKLMN0PQRSTU`

(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 a black character or reverse character

A B

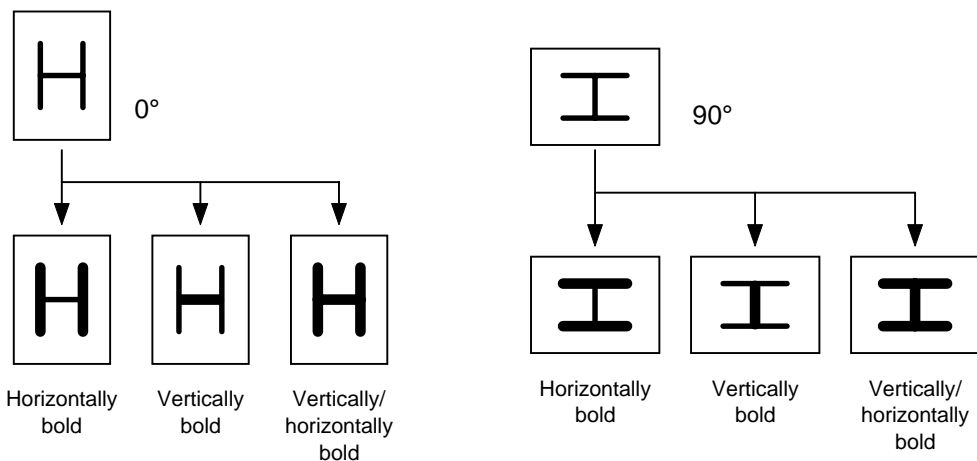
Black characters

A B

Reverse characters

A reverse character is (6 × magnifications) dots wider and longer than a black character. In this case, the magnification is the horizontal magnification or vertical magnification whichever is larger.

(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. When Modulus 10 is designated and the data includes any data other than the numerals, the data row will not be drawn. When Modulus 43 is designated and the data includes any character other than CODE39, no drawing will take place.

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 the numerals, drawing is not performed.

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

(10) Increment/decrement

[The following applies to the B-472-QP/QQ (up to V2.3).]

Printing is performed while the data is incremented or decremented each time a label is issued. Where the data row includes any data other than numerals, the data row will not be drawn. 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

[The following applies to the B-472-QP/QQ (V2.4 or after).]

Letters and numerals for increment/decrement

- Bit map font, outline font

For the data string, up to 40 digits (including letters, numerals and symbols) are possible.

Example of increment/decrement calculation

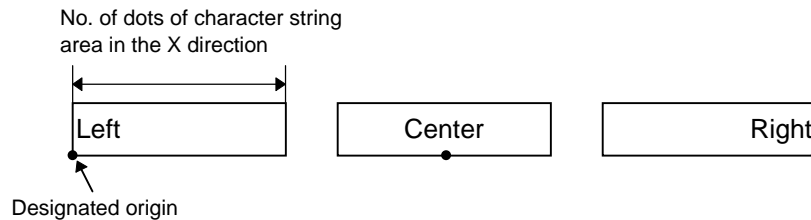
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(11) Zero suppression

No. of zeros to be suppressed	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	▯▯▯0	▯▯00	▯A12	▯123	0123	0123

The leading zero(s) in a data row is replaced by a space(s) according to the designated number of digits. However, if the number of digits to be suppressed is greater than the data row, the data row will be drawn without zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

(12) Alignment



(13) 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 255, exceeding 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.

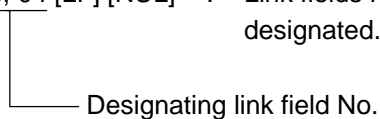
Up to 20 fields can be linked.

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

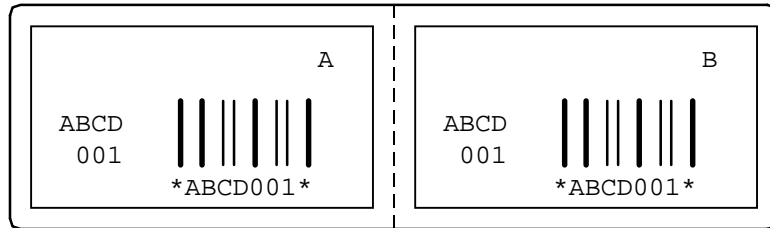
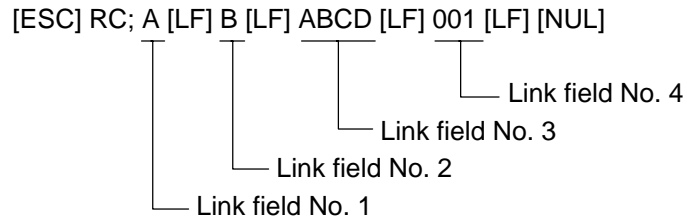
[Format Command]

```
[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]



Notes

- (1) The check digit attach, increment/decrement, and zero suppress processes 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 incrementing/decrementing has been designated can be drawn. If a total of bit map font, outline font or bar code 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 (Increment character string No. 001 (+1))
- 2) Format Command (No incrementing for character string No. 002)
- 3) Format Command (Increment 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. 002 "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.

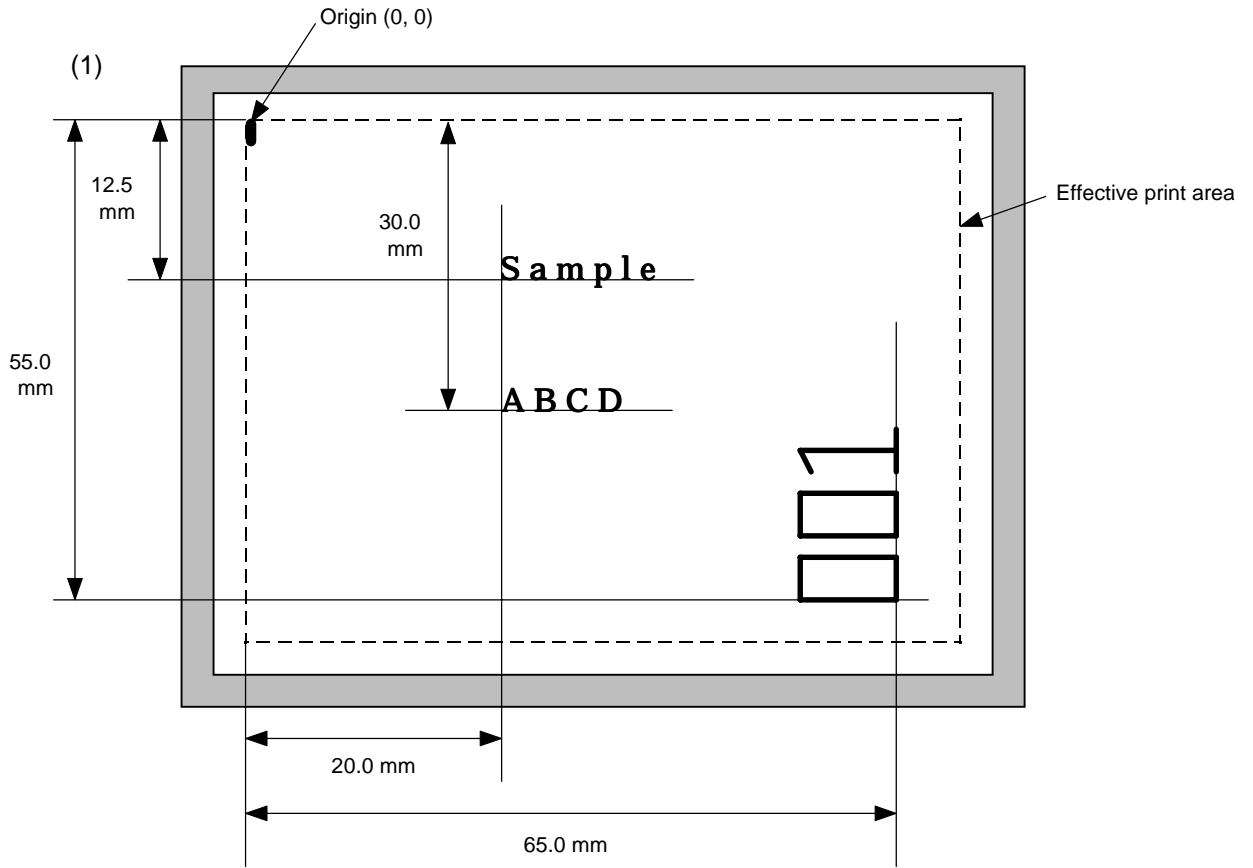
```
[ESC] P C001; 0100, 0150, 1, 1, A, 00, B [LF]  
C002; 0350, 0180, 1, 1, A, 00, B [LF]  
C005; 0200, 0300, 25, 2, C, +05, 00, B, +0000000001 [LF]  
V01; 0500, 0400, 0100, 0100, A, 00, B [LF] [NUL]
```

- (4) When the drawing data is changed per label issue during printing, 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 which differs according to the drawing fields should be designated. 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.

Refer to

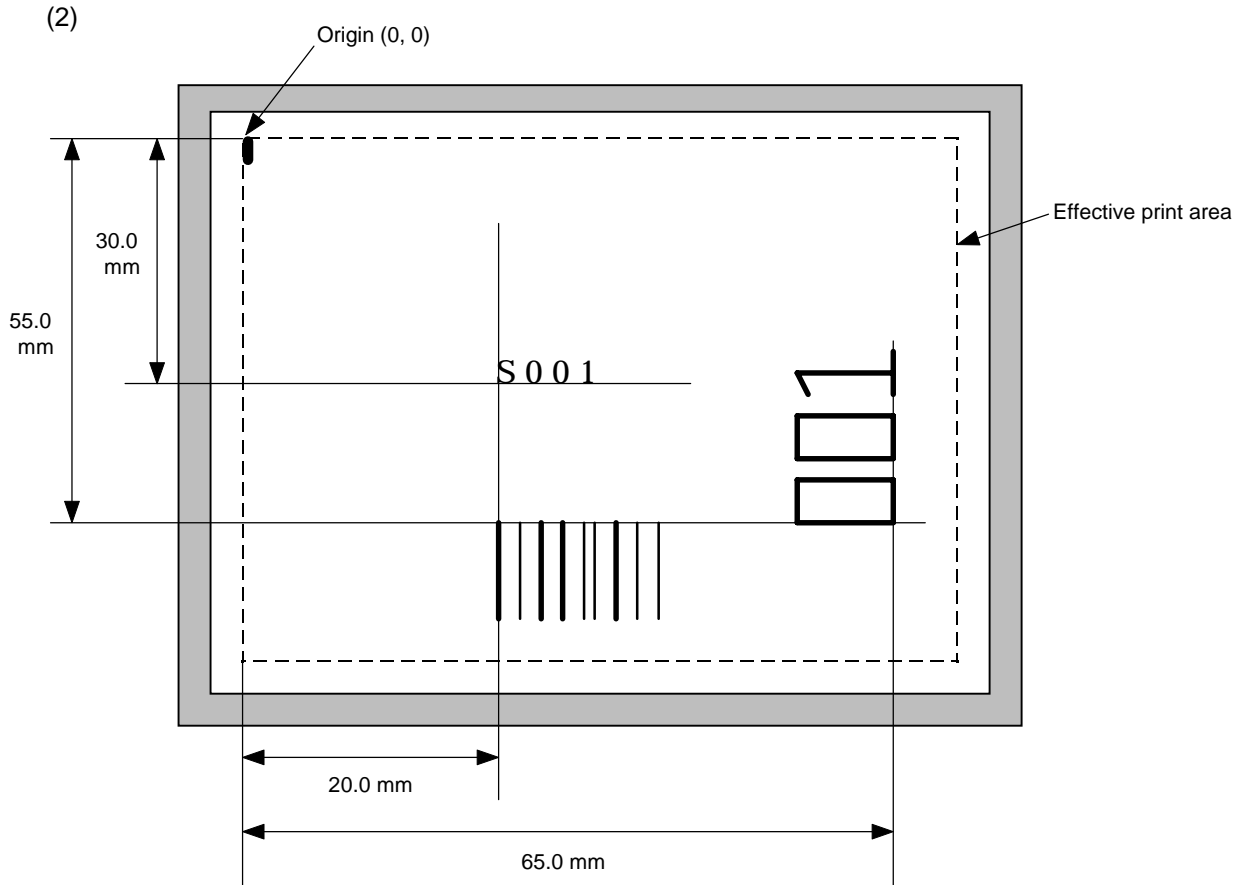
Bit Map Font Data Command ([ESC] RC)
Outline Font Format Command ([ESC] PV)
Bar Code Format Command ([ESC] XB)

Examples



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC000; 0200, 0300, 1, 1, A, 00, B=ABCD"; LF$; NUL$;
30 PRINT #1, ESC$; "PC001; 0200, 0125, 1, 1, C, 00, B"; LF$; NUL$;
40 PRINT #1, ESC$; "PC002; 0650, 0550, 2, 2, G, 33, B, +00000000001"; LF$; NUL$;
50 PRINT #1, ESC$; "RC001; Sample"; LF$; NUL$;
60 PRINT #1, ESC$; "RC002; 001"; LF$; NUL$;
70 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;
    
```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0650, 0550, 0200, 0150, B, 33, B; 02" ; LF$; NUL$;
40 PRINT #1, ESC$; "XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02"; LF$;
NUL$;
50 PRINT #1, ESC$; "RC; S"; LF$; "001"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```

6.11 OUTLINE FONT FORMAT 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	<p>① [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (=ppp-----ppp) [LF] [NUL]</p> <p>② [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (; qq₁, qq₂, qq₃, -----, qq₂₀) [LF] [NUL]</p>
Term	<p>aa: Character string number 00 to 99</p> <p>bbbb: Print origin of X-coordinate of the character string Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of the character string Fixed as 4 digits (in 0.1 mm units)</p> <p>dddd: Character width 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)</p> <p>ghhh: Fine adjustment of character-to-character space (omissible) g: Designates whether to increase or decrease the character-to-character space. +: Increase -: Decrease hhh: No. of space dots between characters 000 to 512 (in 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> <p>j: Selection of a black character or reverse character. B: Black character W: Reverse character</p> <p>Mk: Type of the check digit to be attached (omissible) 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)</p>

Term

Immmmmmmmm: Increment and decrement (omissible)
 I: Designates whether to increment or decrement.
 +: Increment
 -: Decrement
 mmmmmmmmm: Skip value
 000000000 to 9999999999

Znn: Zero suppression (omissible)
 nn: No. of zeros to be suppressed
 00 to 20

Po: Alignment (omissible)
 q: Designates the character position
 1: Left
 2: Center
 3: Right
 * If omitted, the alignment is set to left.

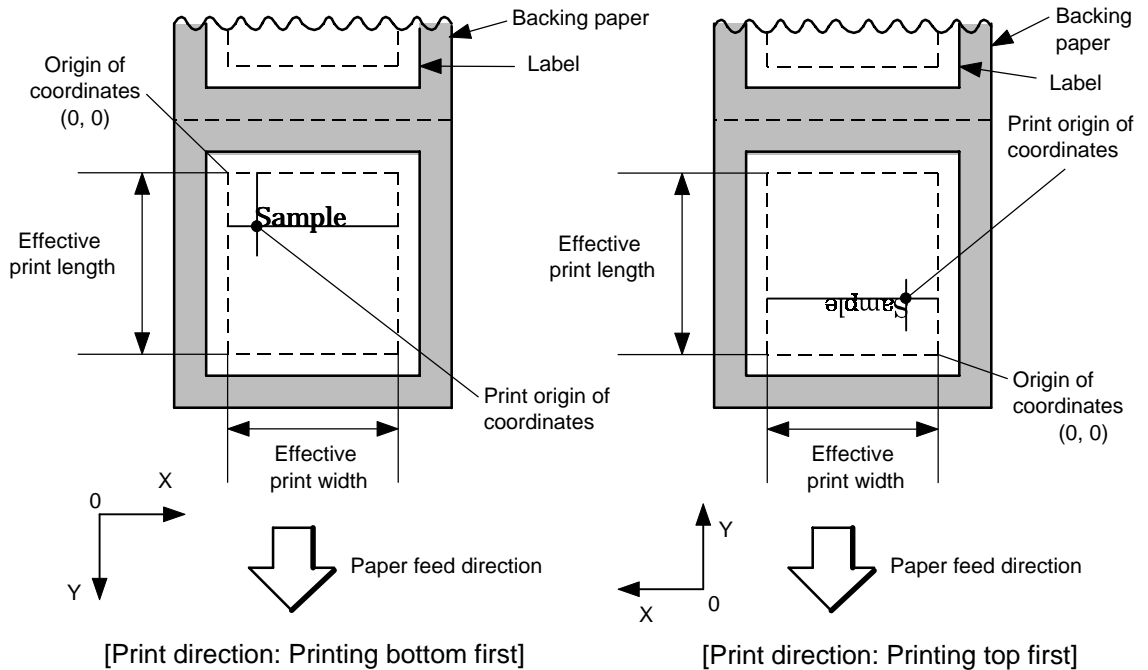
ppp-----ppp: Data string to be printed (omissible)
 Max. 255 digits

qq₁, qq₂, qq₃, -----, qq₂₀: Link field No. (omissible)
 01 to 99 (1 to 99 can be also 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



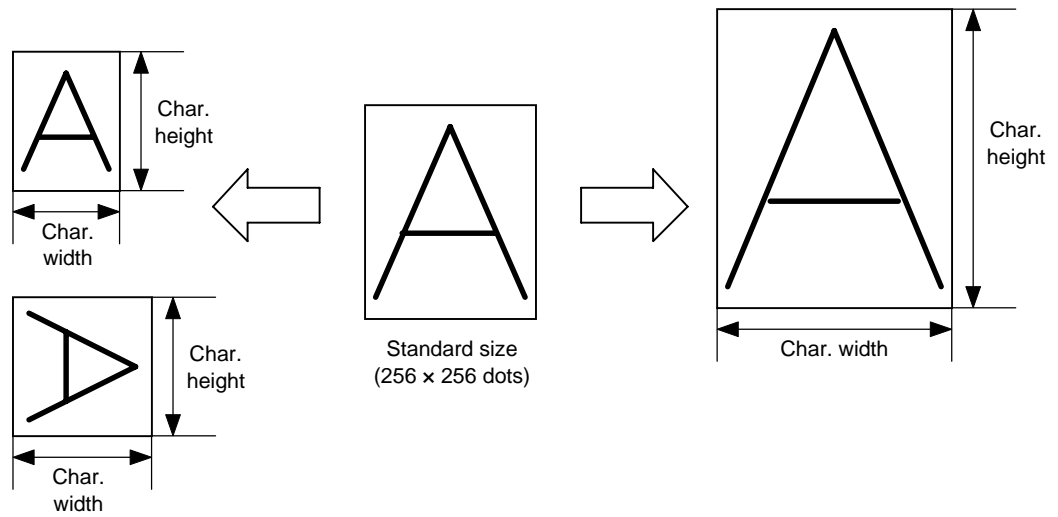
- The print origin of coordinates must be set so that the result of character drawing will be within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area]

[mm]

Item		Model		B-472		
		Method	Batch	Strip	Cut	
Effective print width		Min.		10.0		
		Max.		104.0		
Effective print length	Label	Min.		6.0	21.4	23.0
		Max.	W/o expansion memory	384.0		
	W/expansion memory		896.0			
	Tag	Min.		8.0	23.4	
		Max.	W/o expansion memory	384.0		
			W/expansion memory	896.0		

(3) Character width and character height



(4) Type of font

A: TEC FONT1 (Helvetica [bold])

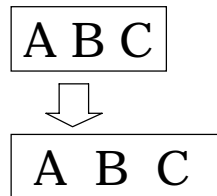
**! " # \$ % & ' () * + ,
0 1 2 3 4 5 6 7 8 9 : ; <
@ A B C D E F G H I J K L
' a b c d e f g h i j k l
Ç ü é â ä à å ç ê ë è ì î**

B: TEC FONT1 (Helvetica [bold] proportional)

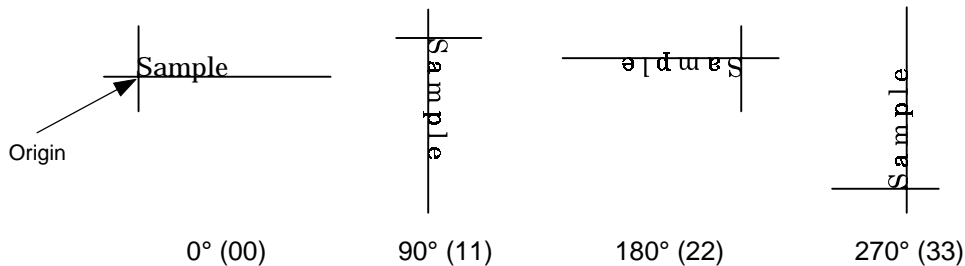
**!"#\$%&'()*+,-./
0123456789:;<=>?
@ABCDEFGHIJKLMNO
'abcdefghijklmno
ÇüéâäàåçêëèìîÄÅ**

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



(6) Rotational angles of a character and character string



(7) Selection of a black character or reverse character

A B

Black characters

A B

Reverse characters

A reverse character is wider and longer than a black character. In this case, the number of dots to be increased varies according to the character size.

(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. When modulus 10 is designated and the data includes any data other than the numerals the data row will not be drawn. When modulus 43 is designated and the data includes any character other than CODE39, no drawing will take place.

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 the numerals, drawing is not performed.

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

(9) Increment/decrement

[The following applies to the B-472-QP/QQ (up to V2.3).]

Printing is performed while the data is incremented or decremented each time a label is issued. Where the data row includes any data other than numerals, the data row will not be drawn. 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

[The following applies to the B-472-QP/QQ (V2.4 or after).]

Letters and numerals for increment/decrement

- Bit map font, outline font

For the data string, up to 40 digits (including letters, numerals and symbols) are possible.

Example of increment/decrement calculation

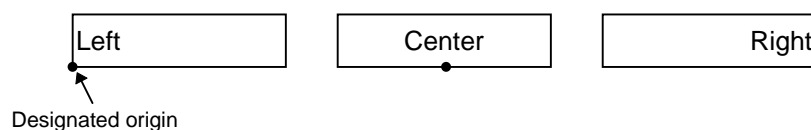
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(10) Zero suppression

No. of zeros to be suppressed	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	└└└0	└└00	└A12	└123	0123	0123

The leading zero(s) in a data row is replaced by a space(s) according to the designated number of digits. However, if the number of digits to be suppressed is greater than the data row, the data row will be drawn without zero suppression. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn.

(11) Alignment



(12) 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 255, exceeding data will be discarded.)

For the character code table, refer to the character code 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]

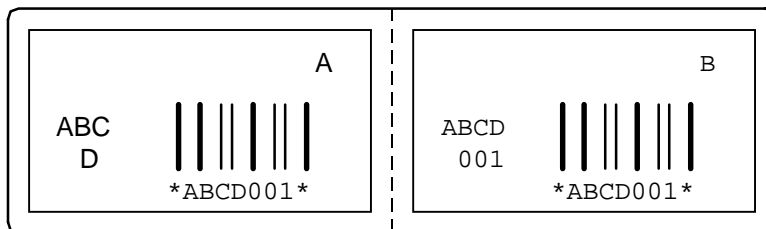
[ESC] PV01; ; 01 [LF] [NUL] : Link field No. 1 is designated.
[ESC] PV02; ; 03 [LF] [NUL] : Link field No. 3 is designated.
[ESC] PV03; ; 04 [LF] [NUL] : Link field No. 4 is designated.
[ESC] XB01; ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[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 link field No.

[Data Command]

[ESC] RV; A [LF] B [LF] ABCD [LF] 001 [LF] [NUL]
Link field No. 1 (A)
Link field No. 2 (B)
Link field No. 3 (ABCD)
Link field No. 4 (001)



Notes

- (1) The check digit attach, increment/decrement, and zero suppress processes 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 incrementing/decrementing has been designated can be drawn. If a total of bit map font, outline font, or bar code 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 (Increment character string No. 01 (+1))
- 2) Format Command (No incrementing for character No. 02)
- 3) Format Command (Increment 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 is changed per label issue during printing, 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 which differs according to the drawing fields should be designated. 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) When characters overlap due to the character-to-character space fine adjustment, the outline font is not painted properly. Program the fine adjust value so that characters will not overlap. Also, when drawings such as lines or characters are on the outline font drawing position, the outline font is not painted properly. Program the fine adjust value so that the drawing will not overlap.
- (6) 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.
- (7) A print data string and link field No. cannot be programmed at the same time.

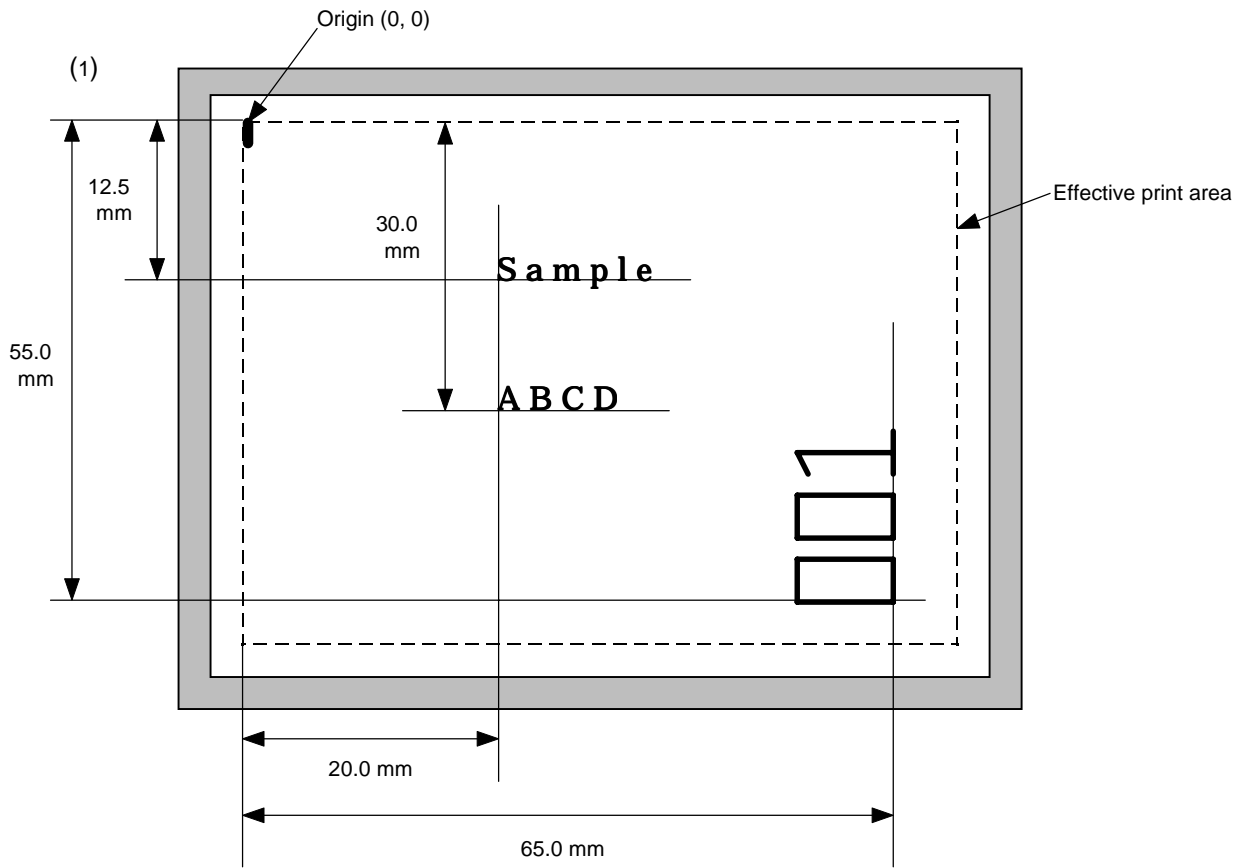
Refer to

Outline Font Data Command ([ESC] RV)

Bit Map Font Format Command ([ESC] PC)

Bar Code Format Command ([ESC] XB)

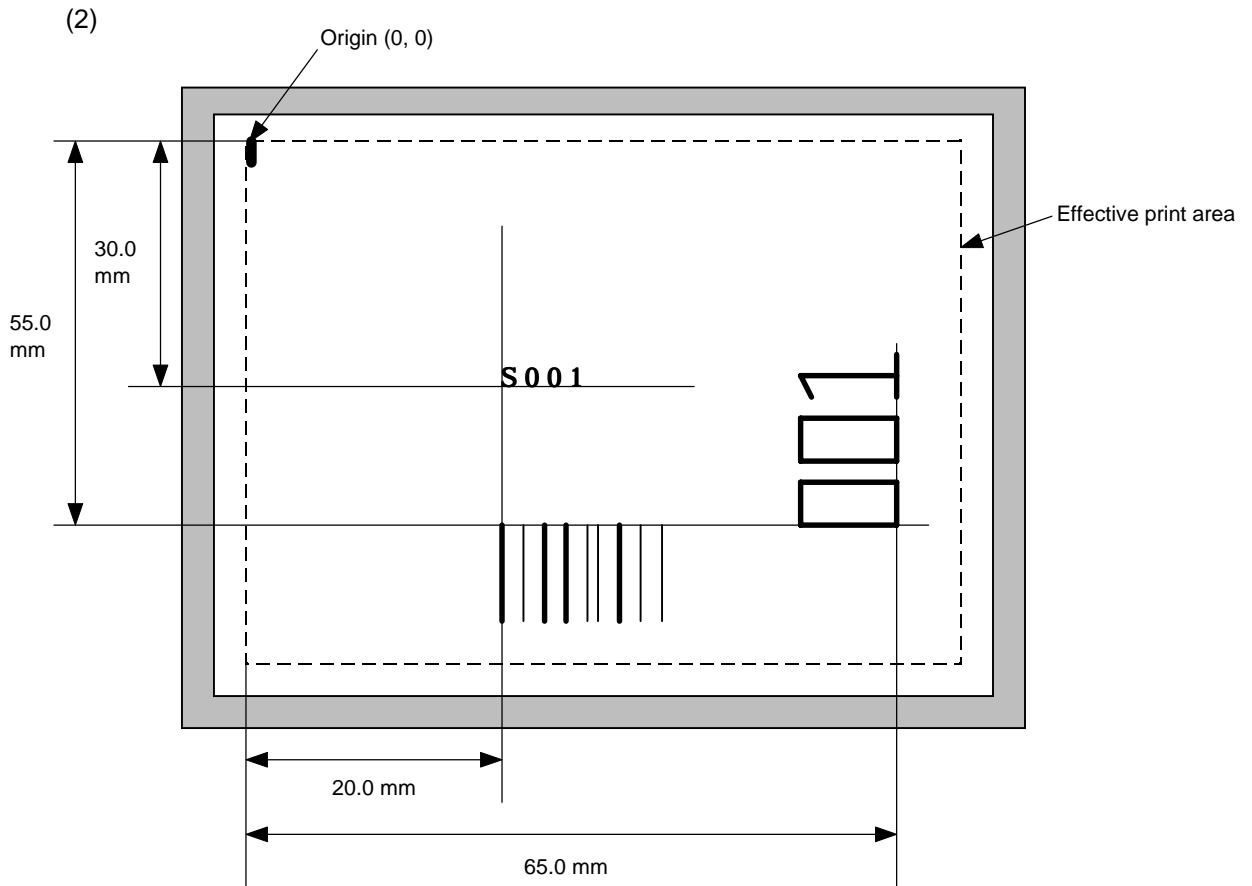
Examples



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PV00; 0200, 0300, 0080, 0080, B, 00, B=ABCD"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0200, 0125, 0100, 0100, B, 00, B"; LF$; NUL$;
40 PRINT #1, ESC$; "PV02; 0650, 0550, 0200, 0150, B, 33, B, +0000000001";
LF$; NUL$;
50 PRINT #1, ESC$; "RV01; Sample"; LF$; NUL$;
60 PRINT #1, ESC$; "RV02; 001"; LF$; NUL$;
70 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0650, 0550, 0200, 0150, B, 33, B; 02" ; LF$; NUL$;
40 PRINT #1, ESC$; "XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02";
LF$; NUL$;
50 PRINT #1, ESC$; "RV; S"; LF$; "001"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```

6.12 BAR CODE FORMAT COMMAND

[ESC] XB

Function	Sets the format to indicate the position on the label, at which the bar code is to be printed and how it is to be printed.
----------	--

⊙ In the case of WPC, CODE93, CODE128, UCC/EAN128 and various postal codes

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

Term	aa: Bar code number 00 to 31 bbbb: Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units) cccc: Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units) d: Type of bar code 0: JAN8, EAN8 5: JAN13, EAN13 6: UPC-E 7: EAN13 + 2 digits 8: EAN13 + 5 digits 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: EAN8 + 2 digits J: EAN8 + 5 digits K: UPC-A L: UPC-A + 2 digits M: UPC-A + 5 digits N: UCC/EAN128 R: Customer bar code (for Japan) S: Highest priority customer bar code (for Japan) U: POSTNET (for U.S) V: RM4SCC (ROYAL MAIL 4 STATE CUSTOMER CODE) (for U.K) W: KIX 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	Modulus 10 + Modulus 103
Customer code	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
-----	---------------------------------
- ff: 1-module width
01 to 15 (in dots)
- k: Rotational angle of bar code
- 0: 0°
 - 1: 90°
 - 2: 180°
 - 3: 270°
- llll: Height of the bar code
0000 to 1000 (in 0.1 mm units)
- mnnnnnnnnn: Increment/decrement (omissible)
- m: Indicates whether to increment or decrement
- +: Increment
- : Decrement
- nnnnnnnnnn: Skip value
0000000000 to 9999999999
- ooo: Length of the WPC guard bar (omissible)
000 to 100 (in 0.1 mm units)
- p: Selection of print or non-print of numerals under bars (omissible)
- 0: Non-print
- 1: Print
- qq: No. of zeros to be suppressed (omissible)
00 to 20
- sss ----- sss: Data string to be printed (omissible)
Max. 126 digits. However, it varies according to the type of bar code.
- tt₁, tt₂, tt₃, -----, tt₂₀: Link field No. (omissible)
01 to 99 (1 to 99 can be also 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 zeros to be suppressed") cannot be set when the postal code (Type of bar code: R, S, U, V, or W) is used.

⊙ In the case of MSI, Interleaved 2 of 5, CODE39, NW7, and Industrial 2 of 5

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

Term	
aa:	Bar code number 00 to 31
bbbb:	Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)
cccc:	Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)
d:	Type of bar code 1: MSI 2: Interleaved 2 of 5 3: CODE39 (standard) 4: NW7 B: CODE39 (full ASCII) O: Industrial 2 of 5
e:	Type of check digit 1: Without attaching check digit 2: Check digit check CODE39 Modulus 43 MSI IBM modulus 10 ITF Modulus 10 Industrial 2 of 5 Modulus check character 3: Check digit auto attachment (1) CODE39 Modulus 43 MSI IBM modulus 10 ITF Modulus 10 Industrial 2 of 5 Modulus check character 4: Check digit auto attachment (2) MSI IBM modulus 10 + IBM modulus 10 ITF DBP Modulus 10 5: Check digit auto attachment (3) MSI IBM modulus 11 + IBM modulus 10
ff:	Narrow bar width 01 to 99 (in dots)
gg:	Narrow space width 01 to 99 (in dots) * In the case of Industrial 2 of 5, an element-to-element space is designated.
hh:	Wide bar width 01 to 99 (in dots)

- ii: Wide space width
01 to 99 (in dots)
* In the case of Industrial 2 of 5, the value is fixed to 00.
- jj: Character-to-character space width
01 to 99 (in dots)
* In the case of MSI and ITF, character-to-character space width is set to 00.
- k: Rotational angle of bar code
0: 0°
1: 90°
2: 180°
3: 270°
- lll: Height of the bar code
0000 to 1000 (in 0.1 mm units)
- mnnnnnnnnn: Increment/decrement (omissible)
 - m: Indicates whether to increment or decrement
 - +: Increment
 - : Decrement
 - nnnnnnnnn: Skip value
0000000000 to 9999999999
- p: Selection of print or non-print of numerals under bars (omissible)
 - 0: Non-print
 - 1: Print
- qq: No. of zeros to be suppressed (omissible)
00 to 20
- r: Designates the attachment of start/stop code (omissible)
 - 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 bar code.
- tt₁, tt₂, tt₃, -----, tt₂₀: Link field No. (omissible)
01 to 99 (1 to 99 can be also used.)
Up to 20 fields can be designated using commas.

⊙ In the case of Data Matrix (two-dimensional code)

- | | |
|--------|---|
| Format | <p>① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijjj) (, Jkklmmnnn) (= ooo -----ooo)
[LF] [NUL]</p> <p>② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijjj) (, Jkklmmnnn)
(= pp₁, pp₂, pp₃, -----, pp₂₀) [LF] [NUL]</p> |
|--------|---|

Term	<p>aa: Bar code number 00 to 31</p> <p>bbbb: Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)</p> <p>d: Type of bar code Q: Data Matrix (two-dimensional code)</p> <p>ee: ECC type</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 45%; text-align: center;">[Before ECC200 was available]</th> <th style="width: 40%; text-align: center;">[After ECC200 became available]</th> </tr> </thead> <tbody> <tr><td>00:</td><td>ECC0</td><td>ECC0</td></tr> <tr><td>01:</td><td>ECC10</td><td>ECC50</td></tr> <tr><td>04:</td><td>ECC40</td><td>ECC50</td></tr> <tr><td>05:</td><td>ECC50</td><td>ECC80</td></tr> <tr><td>06:</td><td>ECC60</td><td>ECC80</td></tr> <tr><td>07:</td><td>ECC70</td><td>ECC80</td></tr> <tr><td>08:</td><td>ECC80</td><td>ECC80</td></tr> <tr><td>09:</td><td>ECC90</td><td>ECC100</td></tr> <tr><td>10:</td><td>ECC100</td><td>ECC100</td></tr> <tr><td>11:</td><td>ECC110</td><td>ECC140</td></tr> <tr><td>12:</td><td>ECC120</td><td>ECC140</td></tr> <tr><td>13:</td><td>ECC130</td><td>ECC140</td></tr> <tr><td>14:</td><td>ECC140</td><td>ECC140</td></tr> <tr><td>20:</td><td>Cannot be set</td><td>ECC200</td></tr> </tbody> </table> <p>ff: 1-cell width 00 to 99 (in dots)</p> <p>gg: Format ID</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;"></th> <th style="width: 45%; text-align: center;">[Before ECC200 was available]</th> <th style="width: 40%; text-align: center;">[After ECC200 became available]</th> </tr> </thead> <tbody> <tr><td>01:</td><td>Format ID 1</td><td>Format ID 1</td></tr> <tr><td>02:</td><td>Format ID 2</td><td>Format ID 2</td></tr> <tr><td>03:</td><td>Format ID 3</td><td>Format ID 3</td></tr> <tr><td>04:</td><td>Format ID 4</td><td>Format ID 4</td></tr> <tr><td>05:</td><td>Format ID 5</td><td>Format ID 5</td></tr> <tr><td>06:</td><td>Format ID 6</td><td>Format ID 6</td></tr> <tr><td>11:</td><td>Format ID 11</td><td>—</td></tr> <tr><td>12:</td><td>Format ID 12</td><td>—</td></tr> <tr><td>13:</td><td>Format ID 13</td><td>—</td></tr> <tr><td>14:</td><td>Format ID 14</td><td>—</td></tr> <tr><td>15:</td><td>Format ID 15</td><td>—</td></tr> <tr><td>16:</td><td>Format ID 16</td><td>—</td></tr> </tbody> </table>		[Before ECC200 was available]	[After ECC200 became available]	00:	ECC0	ECC0	01:	ECC10	ECC50	04:	ECC40	ECC50	05:	ECC50	ECC80	06:	ECC60	ECC80	07:	ECC70	ECC80	08:	ECC80	ECC80	09:	ECC90	ECC100	10:	ECC100	ECC100	11:	ECC110	ECC140	12:	ECC120	ECC140	13:	ECC130	ECC140	14:	ECC140	ECC140	20:	Cannot be set	ECC200		[Before ECC200 was available]	[After ECC200 became available]	01:	Format ID 1	Format ID 1	02:	Format ID 2	Format ID 2	03:	Format ID 3	Format ID 3	04:	Format ID 4	Format ID 4	05:	Format ID 5	Format ID 5	06:	Format ID 6	Format ID 6	11:	Format ID 11	—	12:	Format ID 12	—	13:	Format ID 13	—	14:	Format ID 14	—	15:	Format ID 15	—	16:	Format ID 16	—
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16:	Format ID 16	—																																																																																			

* When ECC200 is designated as ECC type, the format ID designation is ignored. When format ID of 11 through 16 is designated in a version applicable to ECC200, the selection of ECC200 is compulsory.

h: Rotational angle of bar code

- 0: 0°
- 1: 90°
- 2: 180°
- 3: 270°

Ciiijj: No. of cells (When this parameter is omitted, it is automatically set.)

..... It can be set in a version applicable to ECC200.

iii: No. of cells in X direction 000 to 144

jjj: No. of cells in Y direction 000 to 144

* Cell setting varies according to the ECC type.

	ECC0 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 32×8 26×12 36×12 36×16 48×16

- When this parameter is omitted, the number of cells is automatically set. Also, when data except for the above values is designated in X and Y directions, the number of cells is automatically set.

Jkklmmnn: Connection setting (No connection when this parameter is omitted.)

.....It can be set in the version applicable to ECC200, or when ECC200 is selected.

kk: Code number 01 to 16

ll: No. of divided codes 01 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.

pp₁, pp₂, pp₃, -----, pp₂₀: Link field No. (omissible)

01 to 99 (1 to 99 can also be used.)

Up to 20 fields can be designated using commas.

⊙ In the case of PDF417 (two-dimensional code)

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 ₁ , kk ₂ , kk ₃ , -----, kk ₂₀) [LF] [NUL]
Term	
aa:	Bar code number 00 to 31
bbbb:	Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)
cccc:	Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)
d:	Type of bar code P: PDF417 (two-dimensional code)
ee:	Security level 00: Level 0 01: Level 1 02: Level 2 03: Level 3 04: Level 4 05: Level 5 06: Level 6 07: Level 7 08: Level 8
ff:	1-module width 01 to 10 (in dots)
gg:	No. of columns (strings) 01 to 30
h:	Rotational angle of bar code 0: 0° 1: 90° 2: 180° 3: 270°
iiii:	Bar height 0000 to 0100 (in 0.1 mm units)
jjj-----jjj:	Data string to be printed (omissible) Max. 2,000 digits
kk ₁ , kk ₂ , kk ₃ , -----, kk ₂₀ :	Link field No. (omissible) 01 to 99 (1 to 99 can be also used.) Up to 20 fields can be designated using commas.

Ⓞ In the case of MicroPDF417 (two-dimensional code)

Format	① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iii (=jjj-----jjj) [LF] [NUL]
	② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iii (; kk ₁ , kk ₂ , kk ₃ , -----, kk ₂₀) [LF] [NUL]
Term	
aa:	Bar code number 00 to 31
bbbb:	Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)
cccc:	Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)
d:	Type of bar code X: MicroPDF417 (two-dimensional code)
ee:	Security level 00: Fixed
ff:	1-module width 01 to 10 (in dots)
gg:	No. of columns/rows 00 to 38
h:	Rotational angle of bar code 0: 0° 1: 90° 2: 180° 3: 270°
iii:	Bar height 0000 to 0100 (in 0.1 mm units)
jjj-----jjj:	Data string to be printed (omissible) Max. 366 digits
kk ₁ , kk ₂ , kk ₃ , -----, kk ₂₀ :	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 numbers 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

“–” for parameter 00 to 04 indicates that the numbers of columns/rows 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.

⊙ In the case of QR code (two-dimensional code)

Format	<p>① [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkklmm) (= nnn --- nnn) [LF] [NUL]</p> <p>② [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkklmm) (= oo₁, oo₂, oo₃ ----- oo₂₀) [LF] [NUL]</p>
--------	---

Term	<p>aa: Bar code number 00 to 31</p> <p>bbbb: Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)</p> <p>d: Type of bar code T: QR code (two-dimensional code)</p> <p>e: Designation of error correction level L: High density level M: Standard level Q: Reliability level H: High reliability level</p> <p>ff: 1-cell width 00 to 52 (in dots)</p> <p>g: Selection of mode M: Manual mode A: Automatic mode</p> <p>h: Rotational angle of the bar code 0: 0° 1: 90° 2: 180° 3: 270°</p> <p>Mi: Selection of model (When this parameter is omitted, Model 1 is automatically selected.) i = 1: Model 1 2: Model 2</p> <p>Kj: Mask number (When this parameter is omitted, the number is automatically set.) j = 0 to 7: Mask number 0 to 7 8: No mask</p> <p>Jkklmm: Connection setting (No connection when this parameter is omitted.) kk = 01 to 16: Value indicating which divided code is connected. ll = 01 to 16: Number of divided codes mm = 00 to FF: EX-ORed value for all data to be printed (not divided) in units of bytes</p> <p>nnn --- nnn: Data string to be printed (omissible) Max. 2000 digits</p> <p>oo₁ --- oo₂₀: Link field No. (omissible) 01 to 99 (1 to 99 can also be used.) Up to 20 digits can be designated using commas.</p>
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⊙ In the case of MaxiCode (two-dimensional code)

Format ① [ESC] XBaa; bbbb, cccc, d (, e) (, Jffgg) (, Zh) [LF] [NUL]

Term

aa: Bar code number
 00 to 31

bbbb: Print origin of X-coordinate of the bar code
 Fixed as 4 digits (in 0.1 mm units)

cccc: Print origin of Y-coordinate of the bar code
 Fixed as 4 digits (in 0.1 mm units)

d: Type of bar code
 Z: MaxiCode (two-dimensional code)

e: Mode selection (omissible)
 0 to 9

* However, only modes 2, 3, 4 and 6 are supported.
(When a mode other than the above is designated, the designation is corrected according to the below table.)

Mode	Mode actually processed
Omitted	Mode 2
Mode 0	Mode 2
Mode 1	Mode 4
Mode 2	Mode 2
Mode 3	Mode 3
Mode 4	Mode 4
Mode 5	Mode 2
Mode 6	Mode 6
Mode 7	Mode 2
Mode 8	Mode 2
Mode 9	Mode 2

Jffgg: Connection setting
 ff: Code number 01 to 08
 gg: No. of divided codes 01 to 08

Zh: Attachment of Zipper block and Contrast block
 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

⊙ In the case of CP code (two-dimensional code)

Format	<p>① [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Cijj) (= kkkk --- kkk) [LF] [NUL]</p> <p>② [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Cijj) (; ll₁, ll₂, ll₃, --- ll₂₀) [LF] [NUL]</p>
Term	<p>aa: Bar code number 00 to 31</p> <p>bbbb: Print origin of X-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: Print origin of Y-coordinate of the bar code Fixed as 4 digits (in 0.1 mm units)</p> <p>d: Type of bar code Y: CP code (two-dimensional code)</p> <p>e: Designation of ECC (Error Correction Code) level 0: No designation 1: 10% 2: 20% 3: 30% 4: 40% 5: 50%</p> <p>When the number of code characters is specified, the designation of ECC level is invalid. When the number of code characters is not specified, a value from "1" to "5" should be set. If "0" (No designation) is specified, the CP code is not printed.</p> <p>ff: 1-cell width 00 to 99 (in dots)</p> <p>g: No. of character bits 0: Set automatically A: 8 bits</p> <p>Designates how many bits are used for representing a character. When "0" is designated, the optimal value is automatically set.</p> <p>h: Rotational angle of the bar code 0: 0° 1: 90° 2: 180° 3: 270°</p> <p>Cijj: No. of code characters (Set automatically when the designation is omitted.) ii = No. of characters in the X direction: 03 to 22 jj = No. of characters in the Y direction: 02 to 22</p> <p>"Character" is a unit for code for encoding the CP code. 1 character occupies a 3×3 square block. When a value for "jj" larger than "ii" is set, an error occurs. The number of cells for the code is as follows. (No. of characters × 3 + 2)</p> <p>When the number of code characters is specified, ECCs (Error Correction Code) are automatically attached to the remaining areas after the characters are encoded.</p>

kkkk --- kkk: Data string to be printed (omissible)
Max. 473 digits

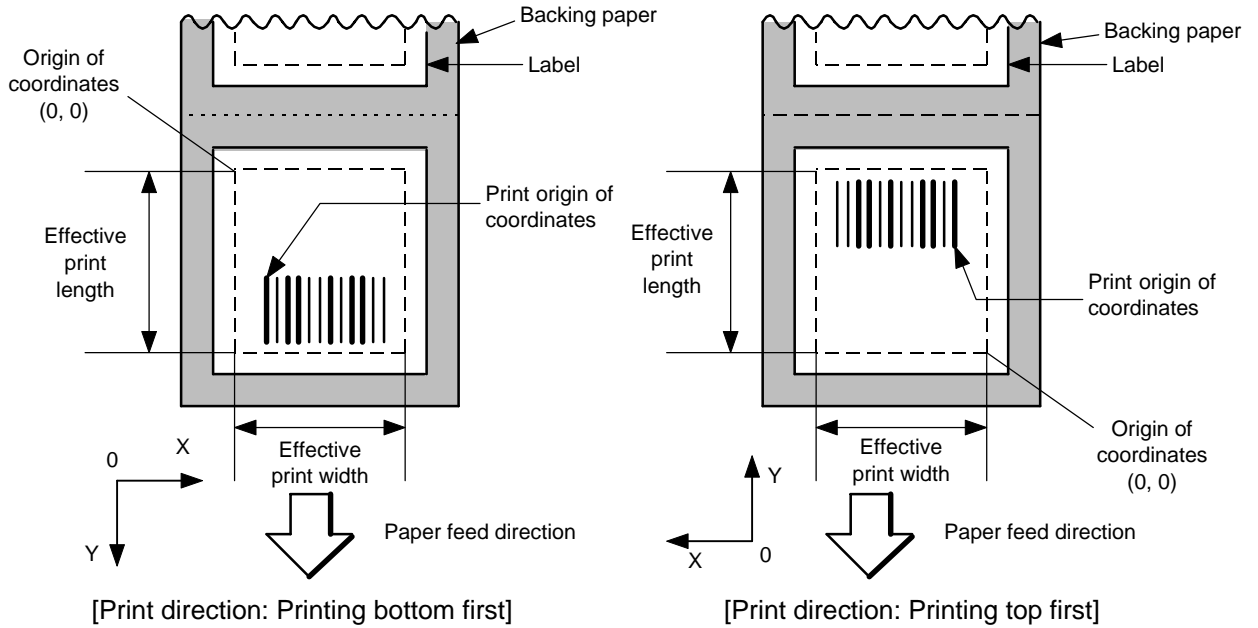
ll₁, ll₂, ll₃, --- ll₂₀: Link field No. (omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 digits can be designated using commas.

Explanation

(1) Bar code number

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

(2) Print origin of coordinates



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

[Effective print area]

[mm]

Item		Model		B-472			
		Method		Batch	Strip	Cut	
Effective print width		Min.		10.0			
		Max.		104.0			
Effective print length	Label	Min.		6.0	21.4	23.0	
		Max.	W/o expansion memory		384.0		
	W/expansion memory		896.0				
	Tag	Min.		8.0	23.4		
		Max.	W/o expansion memory		384.0		
			W/expansion memory		896.0		

(3) Type of bar code

0: JAN8, EAN8



2: Interleaved 2 of 5



4: NW7



6: UPC-E



8: EAN13 +5 digits



B: CODE39 (Full ASCII)



G: UPC-E + 2 digits



I: EAN8 + 2 digits



K: UPC-A



1: MSI



3: CODE39 (Standard)



5: JAN13, EAN13



7: EAN13 + 2 digits



9: A: CODE128



C: CODE93



H: UPC-E + 5 digits



J: EAN8 + 5 digits



L: UPC-A + 2 digits



M: UPC-A + 5 digits



N: UCC/EAN128



O: Industrial 2 of 5



P: PDF417



Q: Data Matrix



R: Customer bar code (for Japan)



S: Highest priority customer bar code (for Japan)



T: QR code



U: POSTNET (for U.S)



V: RM4SCC (for U.K)
(ROYAL MAIL 4 STATE CUSTOMER CODE)



W: KIX code (for Belgium)



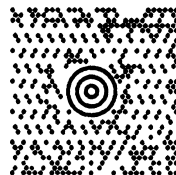
X: MicroPDF417



Y: CP Code



Z: MaxiCode



(4) Type of check digit

- ① Where no check digit is attached, the bar code of the data row will be drawn.
- ② In the case of the check digit check, if each check digit checked according to the type of bar code is normal, the bar code will be drawn. If the check digit not meeting the requirement is designated, the bar code will not be drawn.
- ③ In the case of the check digit auto attachment, each check digit is attached according to the type of bar code and the bar code is drawn.
- ④ If the type of bar code is CODE93, CODE128 (with auto code selection), or UCC/EAN128, the check digit will always be attached regardless of the designation of the type of check digit.
- ⑤ If the type of bar code is JAN, EAN, or UPC, the designation of no check digit attachment automatically assume the check digit check.
- ⑥ DBP Modulus 10 is Modulus 10 for Deutsche Bundespost Postdienst only.

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

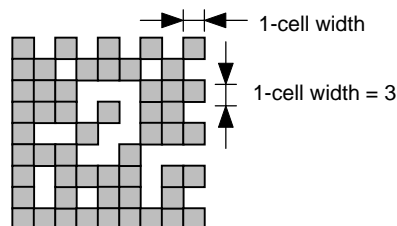
Designate the bar, space, and character-to-character space widths according to the type of bar code. Note that the designated proper value differs according to the rotational angle of bar code, type, number of digits, print speed, paper and ribbon used, etc. Examples of such designations are listed below. (1 dot = 1/8 mm)

In the case of JAN, EAN, UPC, CODE93, CODE128, UCC/EAN128, PDF417, or MicroPDF417, a 2 to 6-module width is calculated automatically when a 1-module width is designated.

Type of bar code	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, EAN128	2		4		6		8		-		-	
PDF417	2		4		6		8		10		12	
MicroPDF417	2		4		6		8		10		12	

Type of bar code	Narrow		Wide		Character-to-character
	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

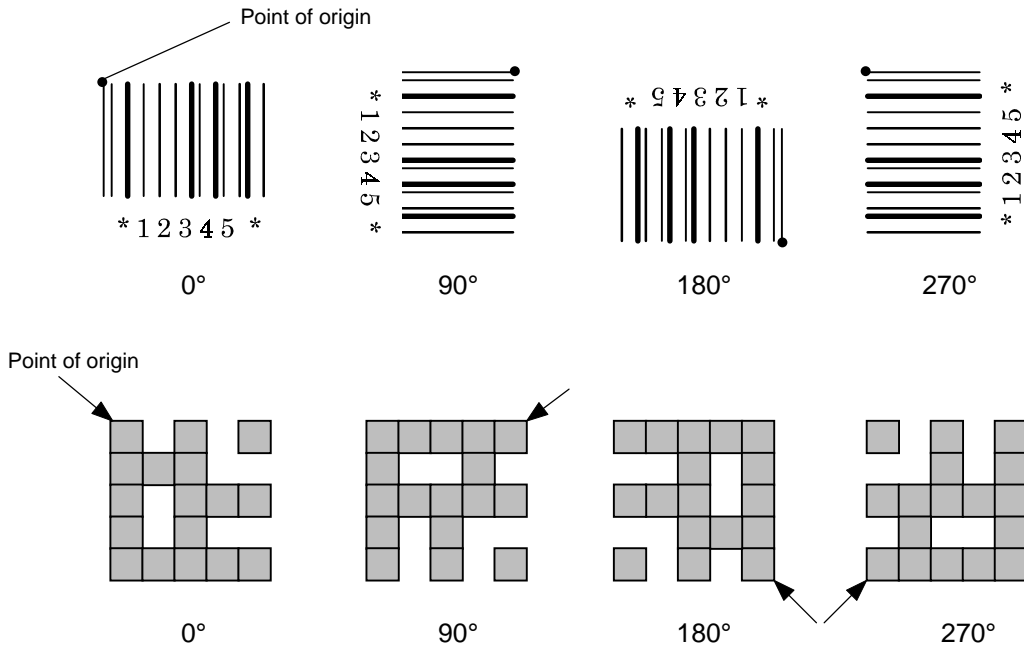
In the case of Data Matrix or CP code



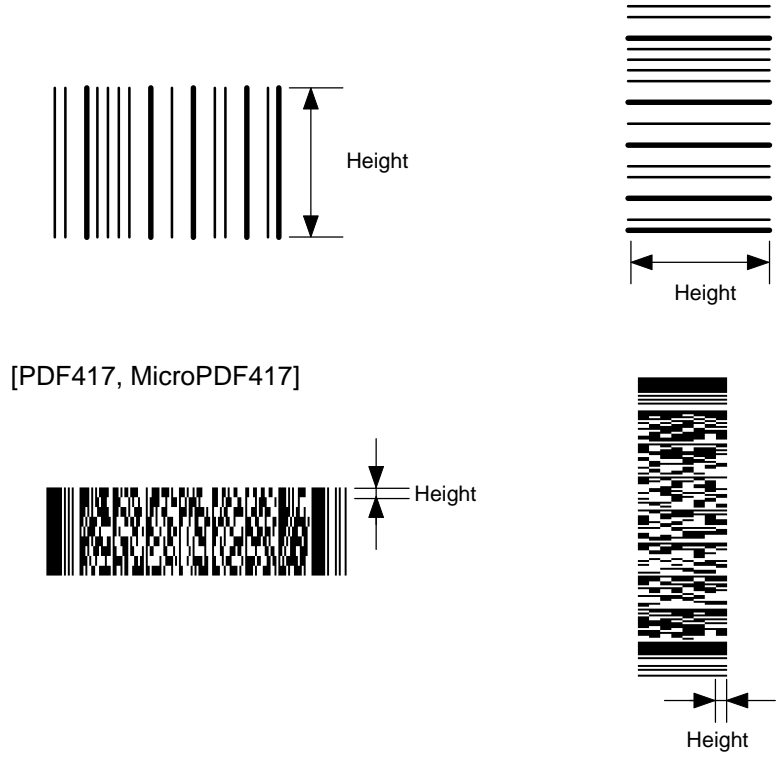
When 1-cell width is 00 for the Data Matrix or CP code, a two-dimensional code is not drawn. However, the two-dimensional code printed on the previous label is cleared.

When NW7 is used, transmission of the space character assumes the space of (narrow space x 12) dots. In this case, the space is max. 255 dots.

(6) Rotational angle of bar code



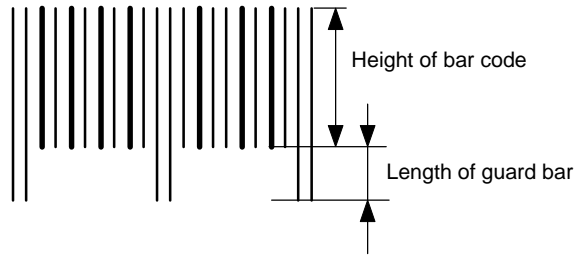
(7) Bar code height



When the bar code height is 0000, bar code (including guard bar) and numerals under bars are not drawn. However, the bar code printed on the previous label is cleared.

(8) Length of guard bar

The length of guard bar is valid only when the type of bar code is WPC. It is ignored in any other cases.



(9) Numerals under bars

Numerals are not or provided under bars according the parameter for the presence or absence of numerals under bars. The contents of numerals under bars to be printed vary according to the type of bar code. The character set of numerals under bars is OCR-B or Prestige Elite. Such numerals are enlarged or reduced only horizontally according to the width of the bar code. They are drawn vertically in the fixed one magnification.

[Drawing positions of numerals under bars]

① In the case of JAN and EAN

(Example) EAN13 + 2 digits



(Example) EAN8



② In the case of UPC

(Example) UPC-A + 2 digits

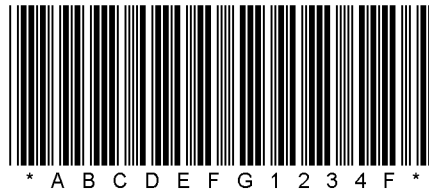


(Example) UPC-E

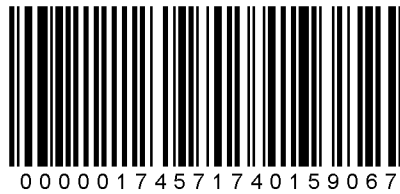


③ In the case of other than JAN, EAN, and UPC

(Example) CODE39



(Example) UCC/EAN128



(10) Start/Stop Code

- This parameter is valid only when the type of bar code is CODE39 and NW7.
- Where the parameter is designated, the program will not check if the transmit print data is with a start code and stop code.
- 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 "Auto Attachment of Start/Stop Code" to be discussed later in this specification.

(11) Increment/decrement

[The following applies to the B-472-QP/QQ (up to V2.3).]

Printing is performed while the data is incremented or decremented each time a label is issued. Where the data row includes any data other than numerals, the data row will not be drawn. 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

[The following applies to the B-472-QP/QQ (V2.4 or after).]

Letters and numerals for increment/decrement

For CODE39 (standard), CODE39 (full ASCII), NW-7, CODE93, CODE128, if a data string other than numerals is included in the data, increment/decrement designation is performed. If any code which does not exist in each bar code table is contained in the data, increment/decrement designation is not performed.

Up to 40 digits (including letters, numerals and symbols) are possible.

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

Example of increment/decrement of data including the special codes of CODE128

Increment/decrement calculation starts from the last digit in the data strings. When the data string to be calculated is numeric, and the next (upper) digit is ">", that is a special code (shown with underline below). The next digit is calculated without incrementing/decrementing these two digits.

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

(12) Zero suppression

No. of zeros to be suppressed	0	1	2	2	3	4	5
Data	0000	0000	0000	0A12	0123	0123	0123
Print	0000	▯▯▯0	▯▯00	▯A12	▯123	0123	0123

The leading zero(s) in a data row is replaced by a space(s) according to the designated number of digits. However, if the number of digits to be suppressed is greater than the data row, the data row will be drawn without 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 code is sent to sending print data, the start/stop code is also counted as a digit. When the bar code type is JAN, EAN, UPC or UCC/EAN 128, the data will be drawn without zero suppression.

(13) 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 types of bar codes. For codes, refer to the bar 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 string are linked by the Link Field Data Command to draw an image.

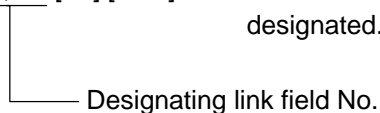
Up to 20 fields can be linked.

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

[Format Command]

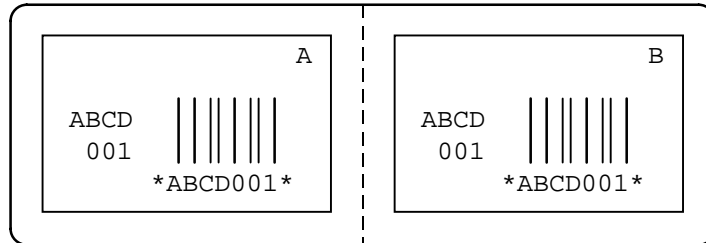
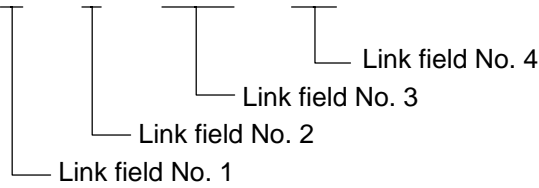
[ESC] PC01; ; 01 [LF] [NUL] : Link field No. 1 is designated.
 [ESC] PC02; ; 03 [LF] [NUL] : Link field No. 3 is designated.
 [ESC] PC03; ; 04 [LF] [NUL] : Link field No. 4 is designated.
 [ESC] XB01; ; 03, 04 [LF] [NUL] : Link fields No. 3 and No. 4 are designated.

[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]



(15) Explanation for Data Matrix

① ECC type

Data Matrix contains a function to correct a code reading error using an error correction code (ECC) and restore normal data. There are several ECCs and ECC is designated 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
ECC0	<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="border-left: 1px solid black; border-right: 1px solid black; height: 100px; position: relative;"> <div style="position: absolute; top: 0; left: 50%; transform: translate(-50%, -50%);">↑</div> <div style="position: absolute; bottom: 0; left: 50%; transform: translate(-50%, 50%);">↓</div> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">High</div> </div>	0%
ECC10		25%
ECC40		33%
ECC50		25%
ECC60		50%
ECC70		33%
ECC80		33%
ECC90		67%
ECC100		50%
ECC110		75%
ECC120		50%
ECC130		67%
ECC140		75%
ECC200			Approx. 30%

② Format ID

Data Matrix can handle all codes including alphanumerics, symbols and Kanji. Since data compression rate varies according to codes, 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)
11	Numerics	0 to 9 space
12	Letters	A to Z space
13	Alphanumerics, symbols	0 to 9 A to Z space . , - /
14	Alphanumerics	0 to 9 A to Z space
15	ASCII (7-bit)	00H to 7FH
16	ISO (8-bit)	00H to FFH (Kanji)

③ Maximum number of digits

The maximum number of digits varies according to the ECC type or format ID. Since each Kanji character uses 2 bytes, the maximum number of digits for it becomes half of the following values.

[Before ECC200 was available]

ECC ID \	0	10	40	50	60	70	80	90	100	110	120	130	140
1 to 6	500 digits												
11	2000 digits												
12	2000 digits							2000	2000	1692	2000	2000	1691
13								1973		1476		1972	1475
14								2000		1547		2000	1546
15								1550		1160		1549	1159
16								1356		1015		1355	1014

[After ECC200 became available]

ECC ID \	0	50	80	100	140
1	500	457	402	300	144
2	452	333	293	218	105
3	394	291	256	190	91
4	413	305	268	200	96
5	310	228	201	150	72
6	271	200	176	131	63

	Numeric	Alphanumeric	8 bits
ECC200	2000	2000	1556

For the maximum number of digits in cell units, see the next page.

④ Connection setting

The connection setting is used to comprise data with a set of two-dimensional codes when the data cannot be expressed with a two-dimensional code. When three two-dimensional codes are used to comprise data, identification information of 1/3, 2/3, and 3/3 is inserted into each two-dimensional code. The ID number is programmed to include a proper combination of two-dimensional codes when one label contains plural connecting symbols. 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 clear.

Cell size and the effective data capacity

[After ECC200 became available]

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

(16) Explanation for the PDF417 and MicroPDF417

① 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 is designated according to usage to perform the error correction function.

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: 0 10px;">↑</div> <div style="margin: 0 10px;">↓</div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">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

② 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 to 30.

If the number of columns is small when data amount is large and security level is also high, drawing may not be performed. This is because the number of lines exceeds 90 when the number of columns becomes small. (When the PDF417 is used, the number of lines of symbols is limited from 3 to 90.)

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 on page 66. 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 bar code is not printed. The number of columns (data strings) is variable from 1 to 4.

However, the max. number of lines, which is 44, depends on the number of columns.

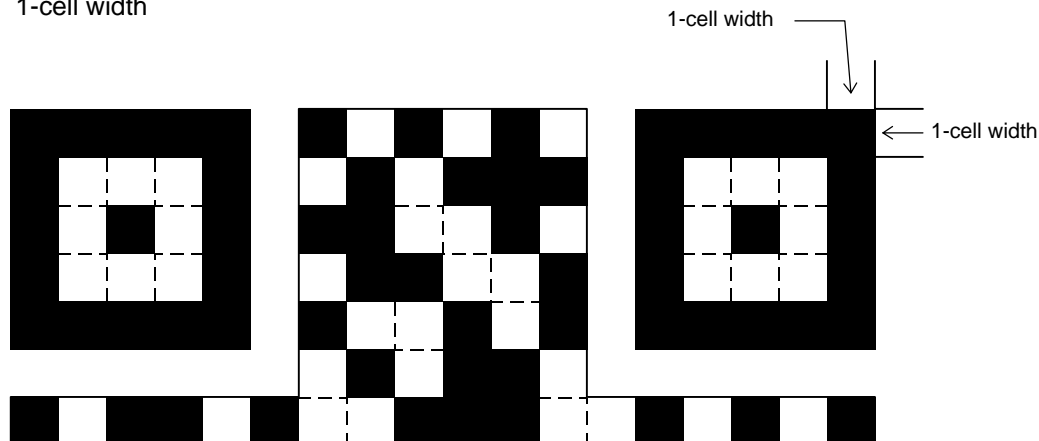
(17) Explanation for QR code

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 general correction ability is as follows.

Level	Error correction ability	Overhead by correcting an error
High density level	<div style="display: flex; flex-direction: column; align-items: center;"> <div style="margin-bottom: 10px;">Low</div> <div style="margin: 0 10px;">↑</div> <div style="margin: 0 10px;">↓</div> <div style="margin-top: 10px;">High</div> </div>	7%
Standard level		15%
Reliability level		25%
High reliability level		30%

② 1-cell width



When the 1-cell width is 0, a two-dimensional code is not drawn. However, the two-dimensional code printed on the previous label is cleared.

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.

④ Selection of model

Model 1: Original specification

Model 2: Extended specification which enhances the function of position correction and contains a large amount of data.

⑤ Mask number

To be sure to read the QR code, 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 EX-ORing 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:

"012345678日本" is divided into "0123," "4567" and "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 EX-ORed value for "0123456789日本".

$$30\ 31\ 32\ 33\ 34\ 35\ 36\ 37\ 38\ 39\ 93\ FA\ 96\ 7B = 84$$

(18) Explanation for MaxiCode

① Connection setting

For MaxiCode, data can be divided into a max. of 8 codes.

(19) Explanation for CP code

① ECC (Error Correction Code) level

The CP code contains a function to correct a code reading error using an error correcting code word and restore normal data. The error correction level is selected according to usage to perform the error correction function.

The higher the percentage of the error correcting code word is, the higher the error correcting ability is.

For the CP code, the program is designed so that all remaining areas are used for correcting errors when the number of code characters is specified by a user. When the number of code characters is specified, "0" (No designation) can be used.

When the number of code characters is not specified by the user, a value from 10 to 50% must be selected. The printer automatically determines the number of code characters so that the error correcting code word exceeds the percentage specified by the user.

② The number of bits per character

Data is compressed by using the 8-bit compaction method. If "0" is specified, the data is compressed in the same way.

Character set for 8 bits

8 bits: ISO 00H to FFH (for Kanji)

③ The number of code characters

For the CP code, a 3×3 cell is used for one block, and the block set forms the CP code.

The numbers of characters in X and Y directions can be set by the user.

When "0" is specified, the printer automatically sets the smallest code size in which data set by the user can be contained.

The rectangular code can be specified. The value for the Y direction must be smaller than the X direction.

The number of cells for the code is as follows.

(No. of code characters) × 3 + 2

Notes

(1) The check digit attach, increment/decrement, and zero suppress processes 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 incrementing/decrementing has been designated can be drawn. If a total of bit map font, outline font or bar code 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]

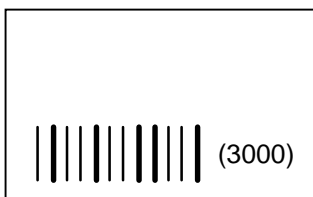
- ① Format Command (Increment bar code No. 01 (+1))
- ② Format Command (Increment bar code No. 02 (+2))
- ③ Image Buffer Clear Command
- ④ Data Command (Bar code No. 01 "0001")
- ⑤ Data Command (Bar code No. 02 "0100")
- ⑥ Issue Command (2 labels)



- ⑦ Issue Command (1 label)



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



- (3) More than one Bar 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]

- (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 bar code number, then the next drawing data is printed. Therefore, the bar code number which differs according to the drawing fields should be designated. 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 bar 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 bar code 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 bar code 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.

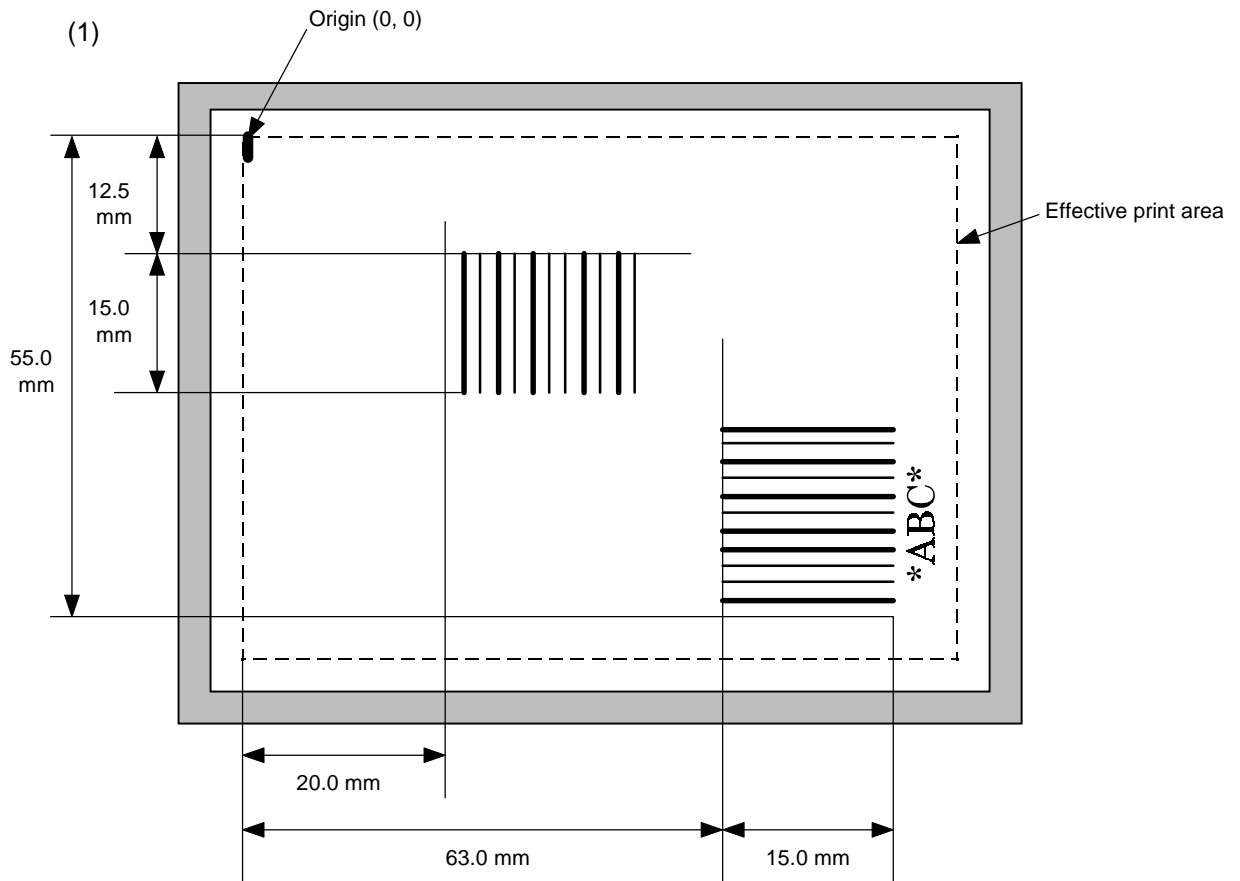
Refer to

Bit Map Font Format Command ([ESC] PC)

Outline Font Format Command ([ESC] PV)

Bar Code Data Command ([ESC] RB)

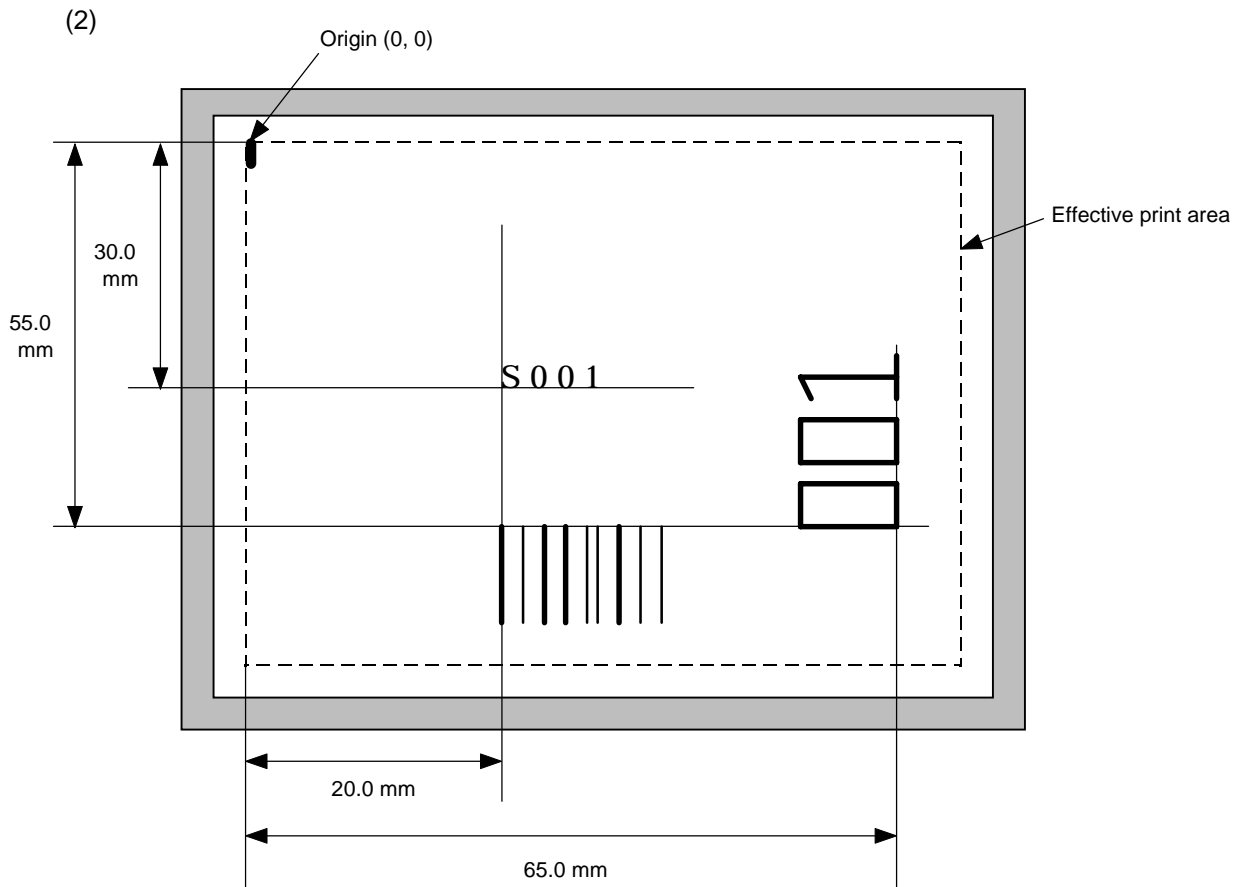
Examples



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "XB01; 0200, 0125, 3, 1, 02, 02, 06, 06, 02, 0, 0150=12345"; LF$;
NUL$;
30 PRINT #1, ESC$; "XB02; 0630, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150,";
40 PRINT #1, "+0000000000, 1, 00, N"; LF$; NUL$;
50 PRINT #1, ESC$; "RB02; * ABC *"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

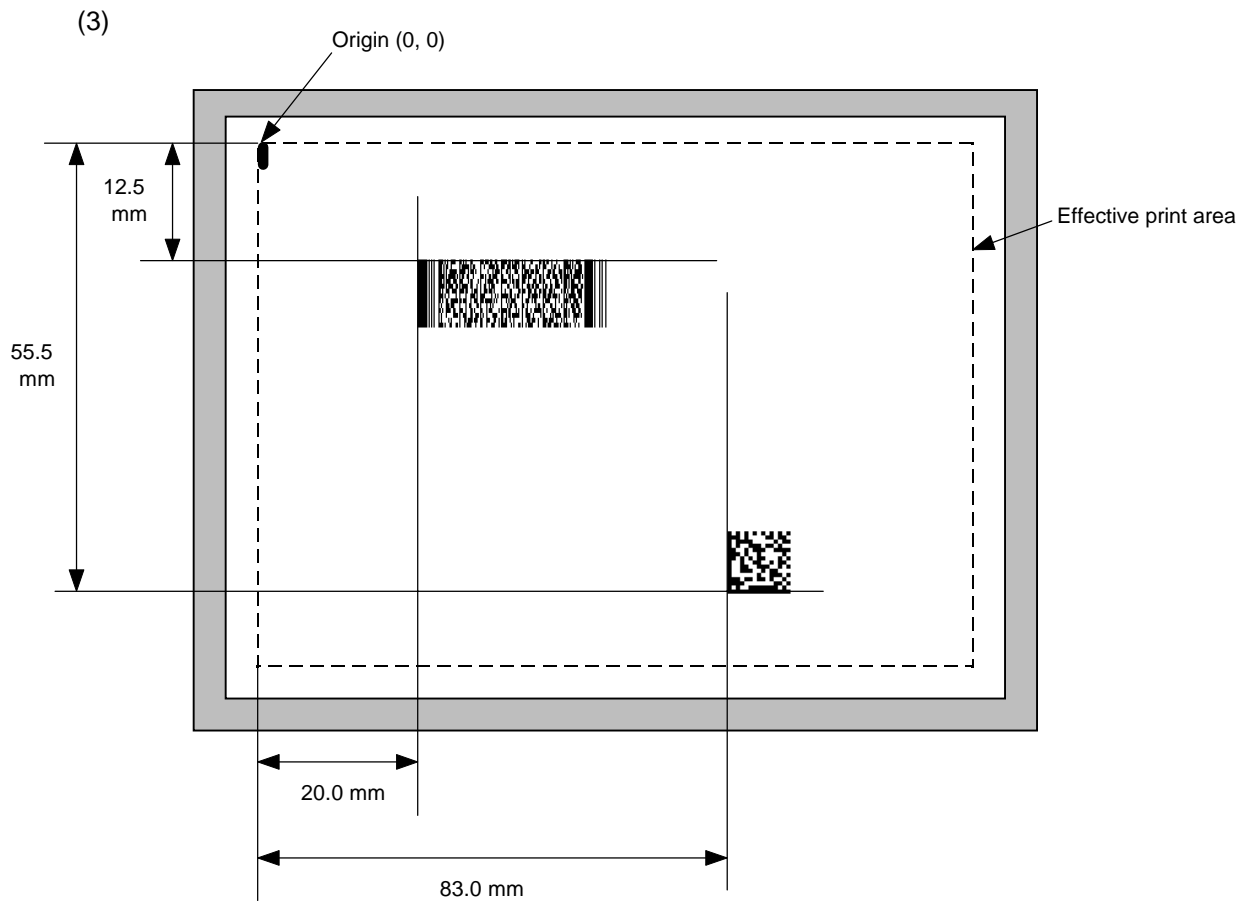
```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0650, 0550, 0200, 0150, B, 33, B; 02" ; LF$; NUL$;
40 PRINT #1, ESC$; "XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02"; LF$;
NUL$;
50 PRINT #1, ESC$; "RB; S"; LF$; "001"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "XB01; 0200, 0125, P, 04, 02, 03, 0, 0010"; LF$; NUL$;
30 PRINT #1, ESC$; "XB02; 0830, 0550, Q, 08, 03, 05, 3"; LF$; NUL$;
40 PRINT #1, ESC$; "RB01; PDF417"; LF$; NUL$;
50 PRINT #1, ESC$; "RB02; Data Matrix"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;
  
```

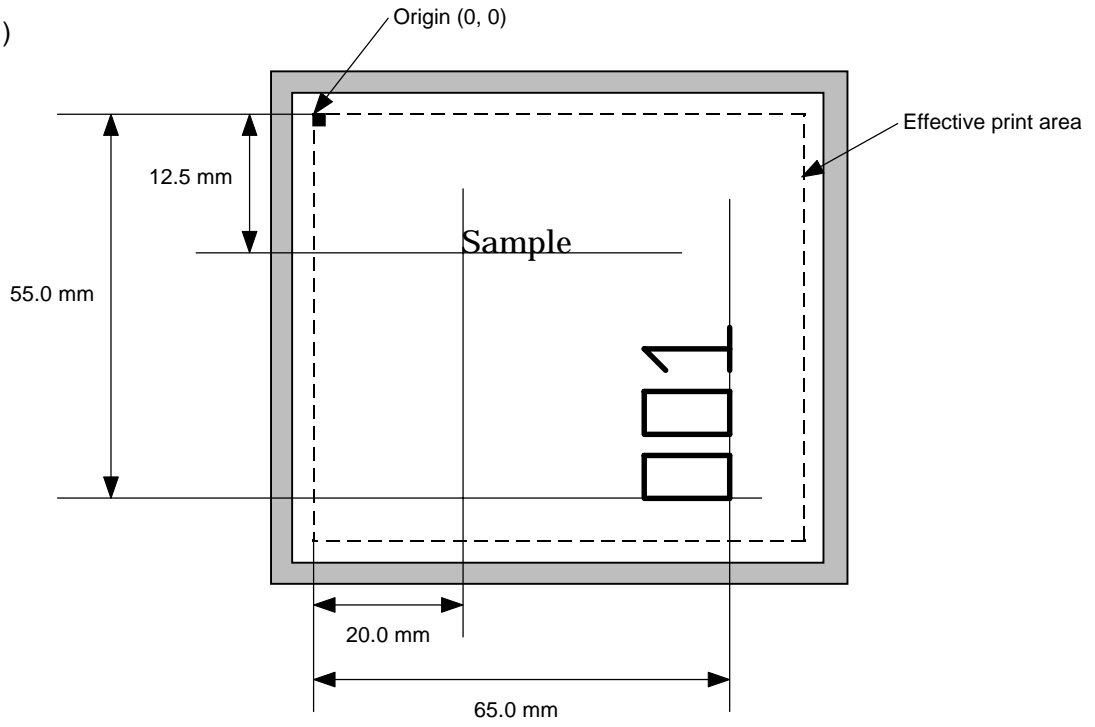
6.13 BIT MAP FONT DATA COMMAND

[ESC] RC

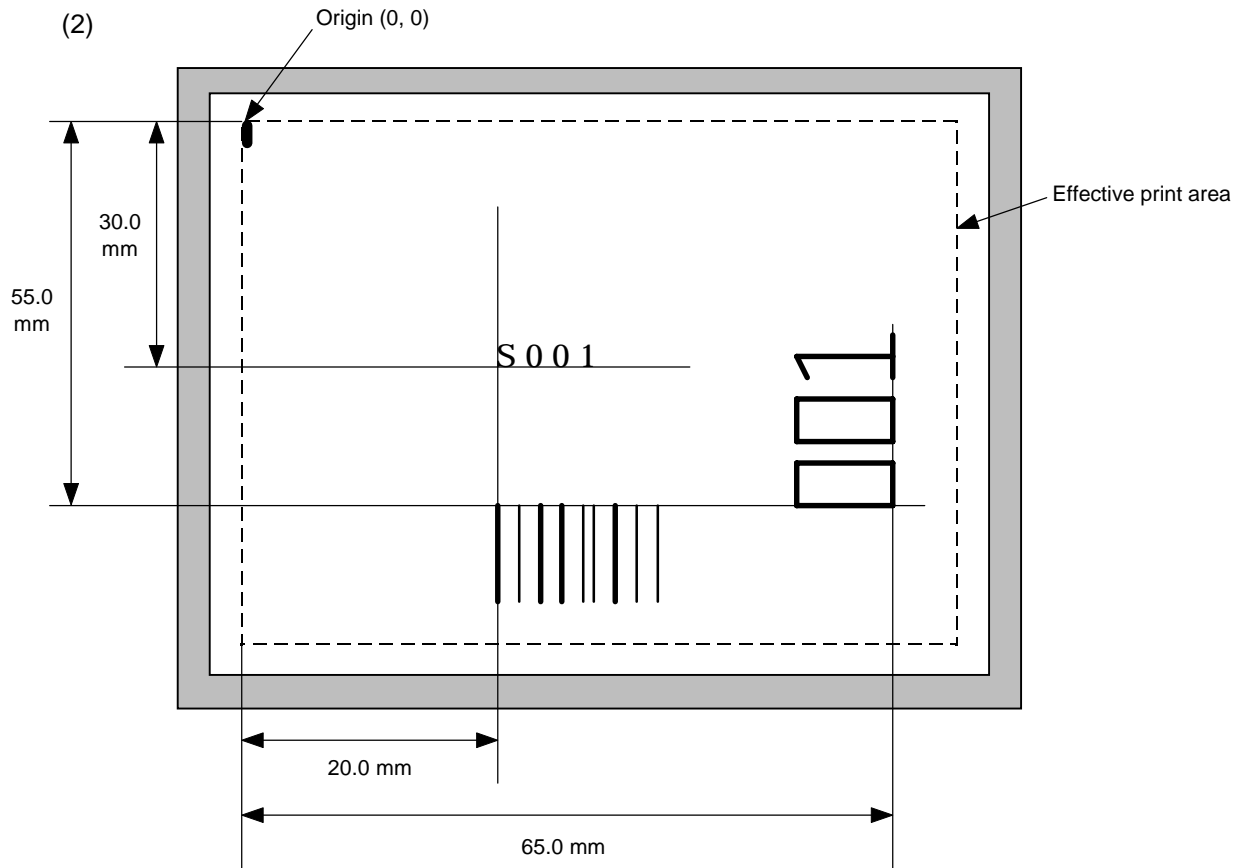
Function	Provides data for the bit map font row.
Format	① [ESC] RCaaa; bbb ----- bbb [LF] [NUL] ② Link Field Data Command [ESC] RC; ccc ----- ccc [LF] ddd ----- ddd [LF] ----- [LF] xxx ----- xxx [LF] [NUL]
Term	aaa: Character string number 000 to 199 (Two digits, 00 to 99, also acceptable) bbb ----- bbb: Data string to be printed Max. 255 digits (Any excess data will be discarded.) For the character codes, refer to the character code table to be given later in this specification. ccc ----- ccc: Data string of link field No. 1 ddd ----- ddd: Data string of link field No. 2 to xxx ----- xxx: Data string of link field No. 99
Explanation	(1) Link field data string <ul style="list-style-type: none">• After the link field No. is designated in the Format Command, data strings are linked using the Link Field Data Command to draw an image.• Up to 255 digits of data strings can be linked. (Exceeding 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 in the Link Field Data Command, the following processing is performed:<ul style="list-style-type: none">① No processing 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 bar code fields. (The same result is obtained when any of the "RC," "RV" or "RB" command code is designated.)
Refer to	Bit Map Font Format Command ([ESC] PC)

Examples

(1)



```
10 PRINT #1, ESC$; "C"; LF$; NUL$;  
20 PRINT #1, ESC$; "PC001; 0200, 0125, 1, 1, A, 00, B"; LF$; NUL$;  
30 PRINT #1, ESC$; "PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001"; LF$; NUL$;  
40 PRINT #1, ESC$; "RC001; Sample"; LF$; NUL$;  
50 PRINT #1, ESC$; "RC002; 001"; LF$; NUL$;  
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;
```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0650, 0550, 0200, 0150, B, 33, B; 02" ; LF$; NUL$;
40 PRINT #1, ESC$; "XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02"; LF$;
NUL$;
50 PRINT #1, ESC$; "RC; S"; LF$; "001"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```

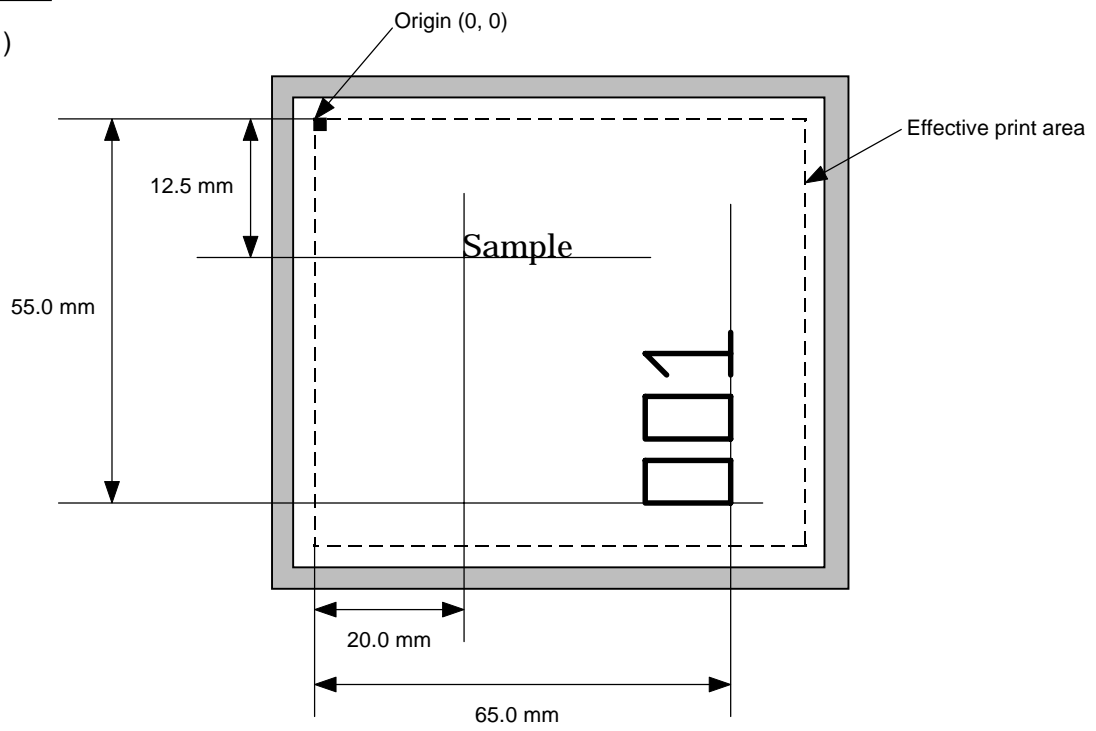
6.14 OUTLINE FONT DATA COMMAND

[ESC] RV

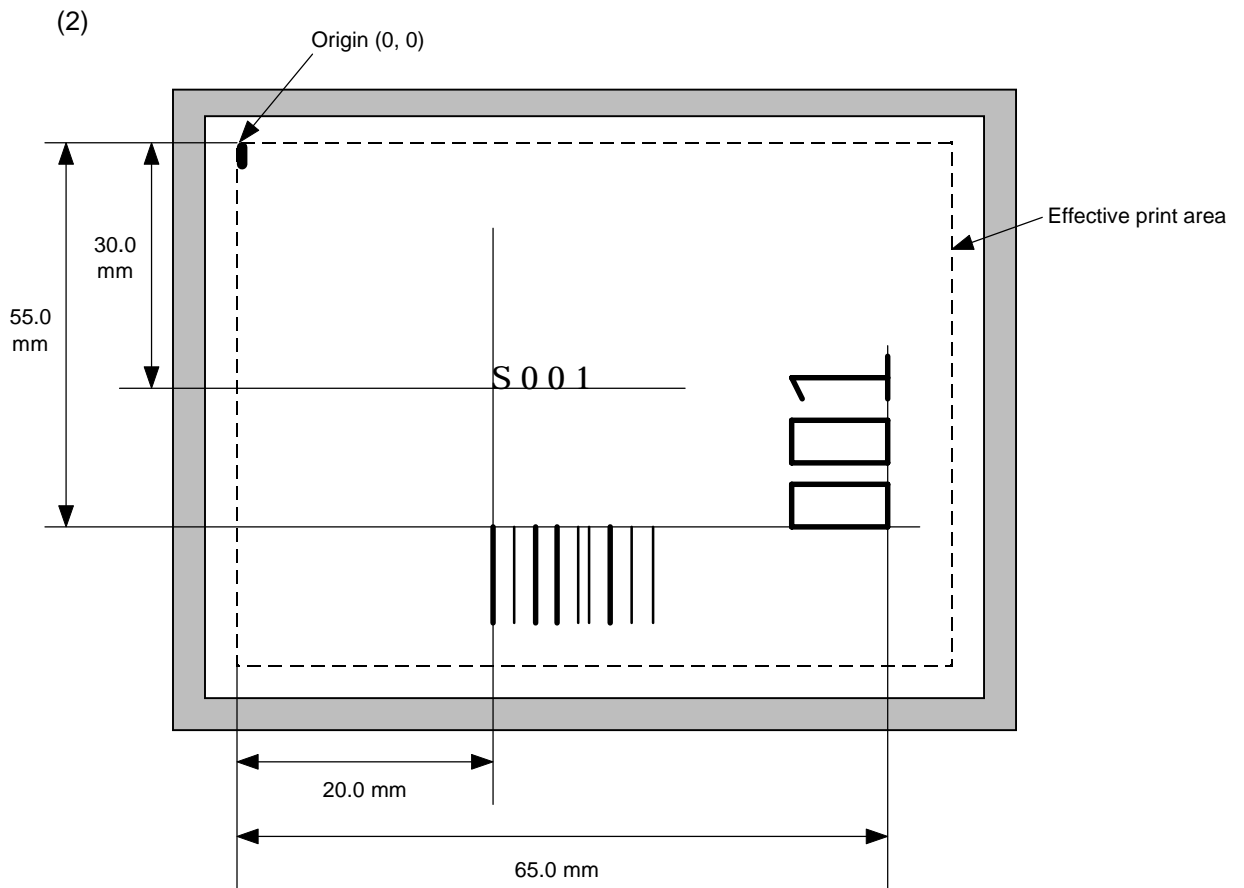
Function	Provides data for the outline font row.
Format	① [ESC] RVaa; bbb ----- bbb [LF] [NUL] ② Link Field Data Command [ESC] RV; ccc ----- ccc [LF] ddd ----- ddd [LF] ----- [LF] xxx ----- xxx [LF] [NUL]
Term	aa: Character string number 00 to 99 bbb ----- bbb: Data string to be printed Max. 255 digits (Any excess data will be discarded.) For the character codes, refer to the character code table to be given later in this specification. ccc ----- ccc: Data string of link field No. 1 ddd ----- ddd: Data string of link field No. 2 to xxx ----- xxx: Data string of link field No. 99
Explanation	(1) Link field data string <ul style="list-style-type: none">• After the link field No. is designated in the Format Command, data strings are linked using the Link Field Data Command to draw an image.• Up to 255 digits of data strings can be linked. (Exceeding 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 in the Link Field Data Command, the following processing is performed:<ul style="list-style-type: none">① No processing 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 bar code fields. (The same result is obtained when any of the "RC," "RV" or "RB" command code is designated.)
Refer to	Outline Font Format Command ([ESC] PV)

Examples

(1)



```
10 PRINT #1, ESC$; "C"; LF$; NUL$;  
20 PRINT #1, ESC$; "PV01; 0200, 0125, 0100, 0100, B, 00, B"; LF$; NUL$;  
30 PRINT #1, ESC$; "PV02; 0650, 0550, 0200, 0150, B, 33, B, +0000000001"; LF$;  
NUL$;  
40 PRINT #1, ESC$; "RV01; Sample"; LF$; NUL$;  
50 PRINT #1, ESC$; "RV02; 001"; LF$; N6000"; LF$; NUL$;  
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;
```

```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0650, 0550, 0200, 0150, B, 33, B; 02"; LF$; NUL$;
40 PRINT #1, ESC$; "XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02"; LF$;
NUL$;
50 PRINT #1, ESC$; "RV; S"; LF$; "001"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```

6.15 BAR CODE DATA COMMAND

[ESC] RB

Function	Provides data for the bar code.
Format	<p>① [ESC] RBaa; bbb ----- bbb [LF] [NUL]</p> <p>② Link Field Data Command [ESC] RB; ccc ----- ccc [LF] ddd ----- ddd [LF] ----- [LF] xxx ----- xxx [LF] [NUL]</p>
Term	<p>aa: Bar code number 00 to 31</p> <p>bbb ----- bbb: Data string to be printed The maximum number of digits varies according to the type of bar code.</p> <p>ccc ----- ccc: Data string of link field No. 1</p> <p>ddd ----- ddd: Data string of link field No. 2 to</p> <p>xxx ----- xxx: Data string of link field No. 99</p>

Explanation	<p>(1) Data check</p> <p>If there is data in the data row, which does not meet the type of bar code, the bar code will not be drawn. If wrong code selection takes place in the data row of CODE128 (no auto code selection), the bar code will not be drawn.</p> <p>If there is data different from the one designated using the format ID when Data Matrix is used, the symbol is not drawn.</p> <p>(2) No. of digits of data</p> <p>When data exceeding the maximum number of digits is sent, the excessive data will be discarded. For the maximum number of digits for each bar code, see below.</p> <table style="margin-left: 40px;"> <tr> <td>Data Matrix, PDF417, QR code:</td> <td>2000 digits</td> </tr> <tr> <td>CP code:</td> <td>473 digits</td> </tr> <tr> <td>MicroPDF417:</td> <td>366 digits</td> </tr> <tr> <td>MaxiCode:</td> <td>93 digits</td> </tr> <tr> <td>Customer bar code:</td> <td>20 digits</td> </tr> <tr> <td>Highest priority customer bar code:</td> <td>19 digits</td> </tr> <tr> <td>POSTNET:</td> <td>5, 9, 11 digits</td> </tr> <tr> <td>ROYAL MAIL 4 STATE CUSTOMER CODE:</td> <td>12 digits</td> </tr> <tr> <td>KIX CODE:</td> <td>18 digits</td> </tr> <tr> <td>Bar code other than the above</td> <td>126 digits</td> </tr> </table> <p>When the number of digits does not correspond to the bar code type, the bar code is not be drawn. (For details, refer to "14. DRAWING OF BAR CODE DATA".)</p> <p>For the MaxiCode, the maximum number of digits varies according to the mode. In mode 2 or 3 and mode 4 or 6, it is 84 digits and 93 digits, respectively.</p> <p>The maximum number of digits for Data Matrix varies according to the ECC type and format ID. Since ECC 200 has become available, it also varies according to the cell size. In the case of Kanji, the maximum number of digits is half those of the values described below since a Kanji character occupies 2 bytes.</p>	Data Matrix, PDF417, QR code:	2000 digits	CP code:	473 digits	MicroPDF417:	366 digits	MaxiCode:	93 digits	Customer bar code:	20 digits	Highest priority customer bar code:	19 digits	POSTNET:	5, 9, 11 digits	ROYAL MAIL 4 STATE CUSTOMER CODE:	12 digits	KIX CODE:	18 digits	Bar code other than the above	126 digits
Data Matrix, PDF417, QR code:	2000 digits																				
CP code:	473 digits																				
MicroPDF417:	366 digits																				
MaxiCode:	93 digits																				
Customer bar code:	20 digits																				
Highest priority customer bar code:	19 digits																				
POSTNET:	5, 9, 11 digits																				
ROYAL MAIL 4 STATE CUSTOMER CODE:	12 digits																				
KIX CODE:	18 digits																				
Bar code other than the above	126 digits																				

[Before ECC200 was available]

ID \ ECC	0	10	40	50	60	70	80	90	100	110	120	130	140
1 to 6	500												
11	2000												
12	2000							2000	2000	1692	2000	2000	1691
13								1973		1476		1972	1475
14								2000		1547		2000	1546
15								1550		1160		1549	1159
16								1356		1015		1355	1014

[After ECC200 became available]

ID \ ECC	0	50	80	100	140
1	500	457	402	300	144
2	452	333	293	218	105
3	394	291	256	190	91
4	413	305	268	200	96
5	310	228	201	150	72
6	271	200	176	131	63

	Numeric	Alphanumeric	8 bits
ECC200	2000	2000	1556

For the maximum number of digits in cell units, see the next page.

Cell Size and Effective Data Capacity

[After ECC200 became available]

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

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 contents of data. Therefore, the maximum number of digits according to modes is as follows.

When letters and numerics are mixed in data in EXC mode, for example, the maximum values become smaller than the following values, since the internal mode switching code is used.

To correct a reading error by designating the security level, the maximum value becomes smaller, since the following error correction code words are used.

When the number of digits of the code word exceeds 928, or when the number of lines exceeds 90 (for PDF417 only), the symbols are not drawn.

For the MicroPDF417, the numbers of lines and digits can be specified.

The maximum number of digits varies according to the setting.

In the case of PDF417

- Extended Alphanumeric Compaction (EXC) mode: 1850 digits
- Binary/ASCII Plus mode: 1108 digits
- Numeric compaction mode: 2000 digits

In the case of 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="border: 1px solid black; padding: 5px; margin-bottom: 10px;">↑</div> <div style="border: 1px solid black; padding: 5px; 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 numbers 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

(3) CODE128 code selection

If 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 (CODE B) 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.

(4) 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 bar code 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).

(5) Kanji code selection

- In the case of Data Matrix and PDF417, Kanji codes can be printed. Shift JIS, JIS hexadecimal, JIS 8 codes can be mixed.

(6) Link field data string

- After the link field No. is designated in the Format Command, data strings are linked using the Link Field Data Command to draw an image.
- Up to 2000 digits of data strings of Data Matrix and PDF417 can be linked. For other bar codes, up to 126 digits can be linked. (The value varies according to the type of bar code.)
When the number of digits exceeds the maximum value, exceeding 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 in the Link Field Data Command, the following processing is performed:
 - ① No processing 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 bar code fields.
(The same result is obtained when any of the "RC," "RV" or "RB" command code is designated.)

(7) 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 (4 digits)	Data to be printed
----------------	-----------------------------------	--------------------

③ 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 \$ % * + - . / :
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.

(8) When the automatic mode is selected in the Format Command for a QR code.

Data to be printed

(9) 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)

* How to transmit the special codes

> (3EH)	=	> 0 (3EH, 30H)
---------	---	----------------

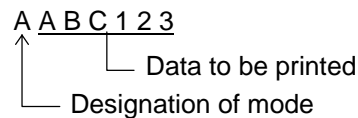
(10) Transfer code for QR code

	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								

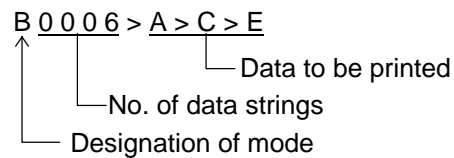
* The shaded parts are Japanese. They are omitted here.

(11) Examples of data designation

① Alphanumeric mode: ABC123

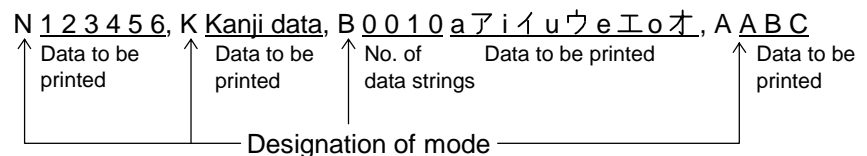


② Binary mode: 01h, 03h, 05h



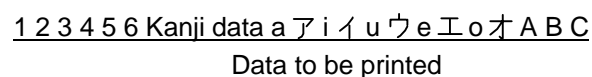
③ Mixed mode

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:



(12) MaxiCode data

For mode 2 or 3:

[ESC] RBaa; bbbbbbccccdddeeee --- eeee [LF] [NUL]

For mode 4 or 6:

[ESC] RBaa; ffffffffggggg --- ggggg [LF] [NUL]

① bbbbbb: Postal code Fixed as 9 digits

• Mode 2:

b1b2b3b4b5: Zip code Fixed as 5 digits (Numerics)

b6b7b8b9: Zip code extension Fixed as 4 digits (Numerics)

• Mode 3:

b1b2b3b4b5b6: Zip code Fixed as 6 digits (Character "A" of code set)

b7b8b9: Vacant Fixed as 3 digits (20H)

② ccc: Class of service Fixed as 3 digits (Numerics)

③ ddd: Country code Fixed as 3 digits (Numerics)

④ eee --- eee: Message data strings 84 digits

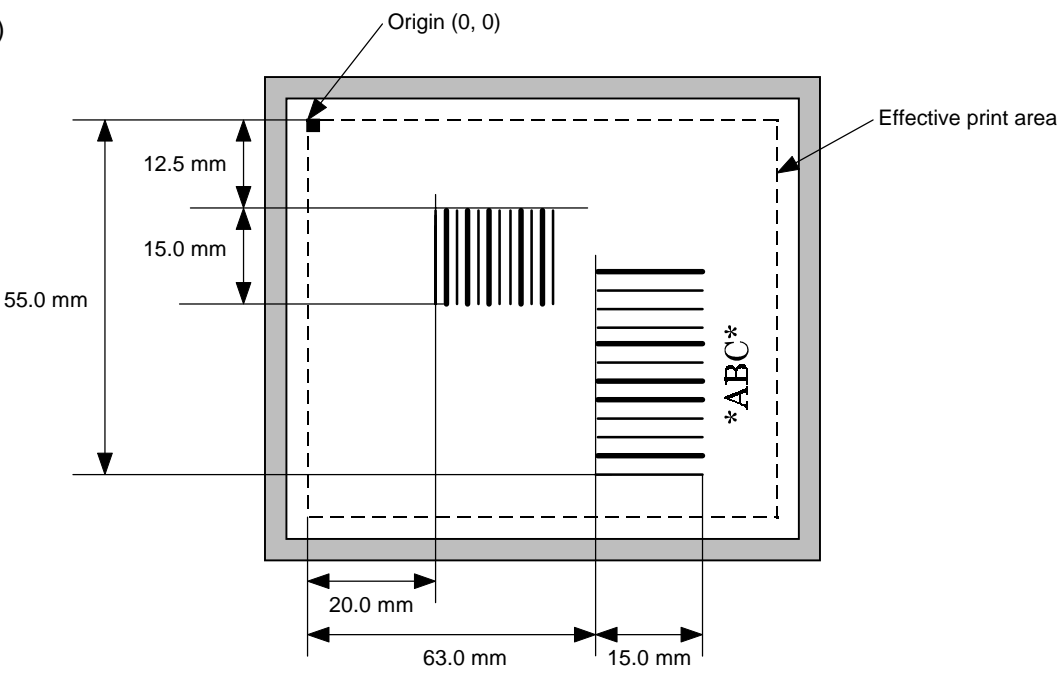
⑤ fffffff: Primary message data strings 9 digits

⑥ ggg --- ggg: Secondary message data strings 84 digits

- NOTES:**
1. When 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 a CR (000000) at the end of the data, and the remaining digits will be padded 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 a CR (000000) at the end of the data, and the remaining digits will be padded 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.

Examples

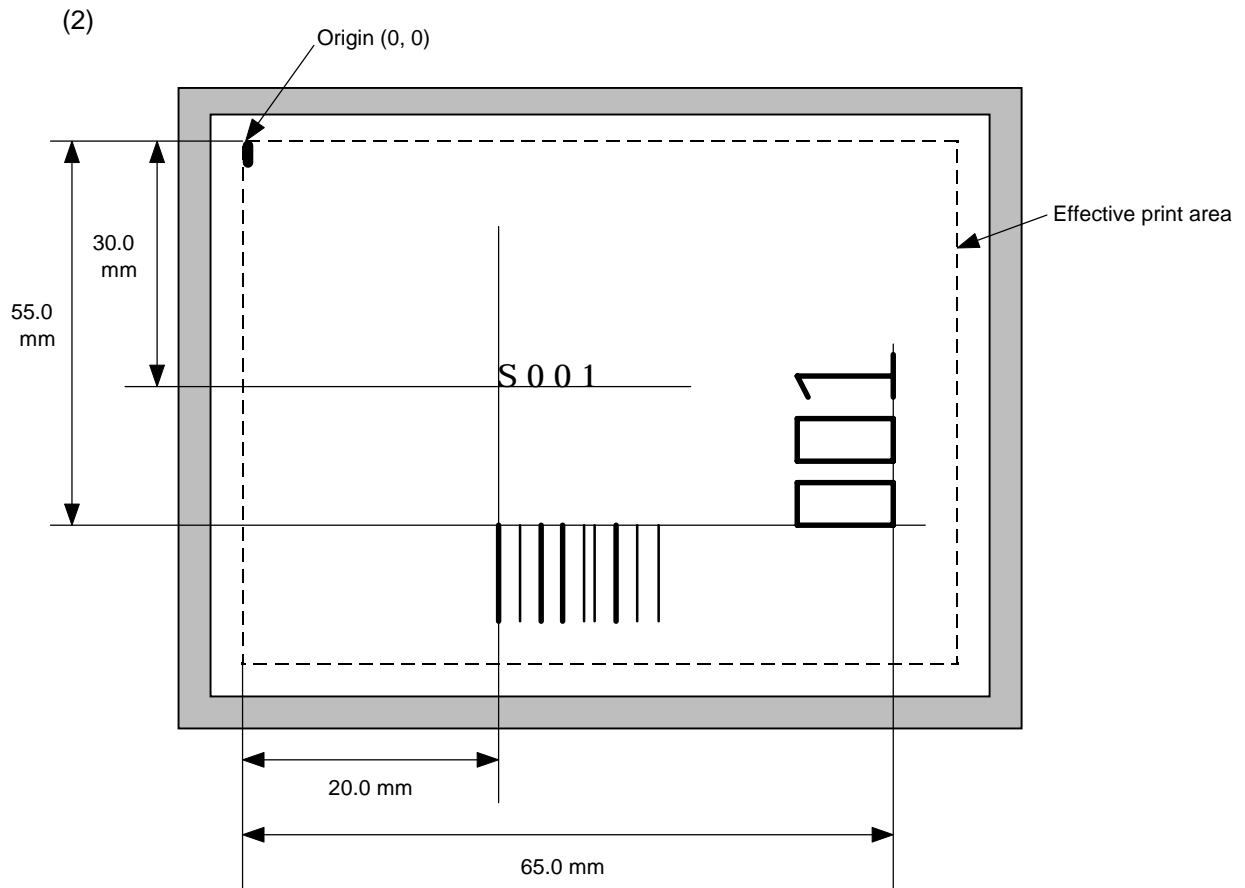
(1)



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "XB01; 0200, 0125, 3, 1, 02, 02, 06, 08, 02, 0, 0150"; LF$; NUL$;
30 PRINT #1, ESC$; "XB02; 0630, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150,";
40 PRINT #1, ESC$; "+0000000000, 1, 00, N"; LF$; NUL$;
50 PRINT #1, ESC$; "RB01; 12345"; LF$; NUL$;
60 PRINT #1, ESC$; "RB02; *ABC*"; LF$; NUL$;
70 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

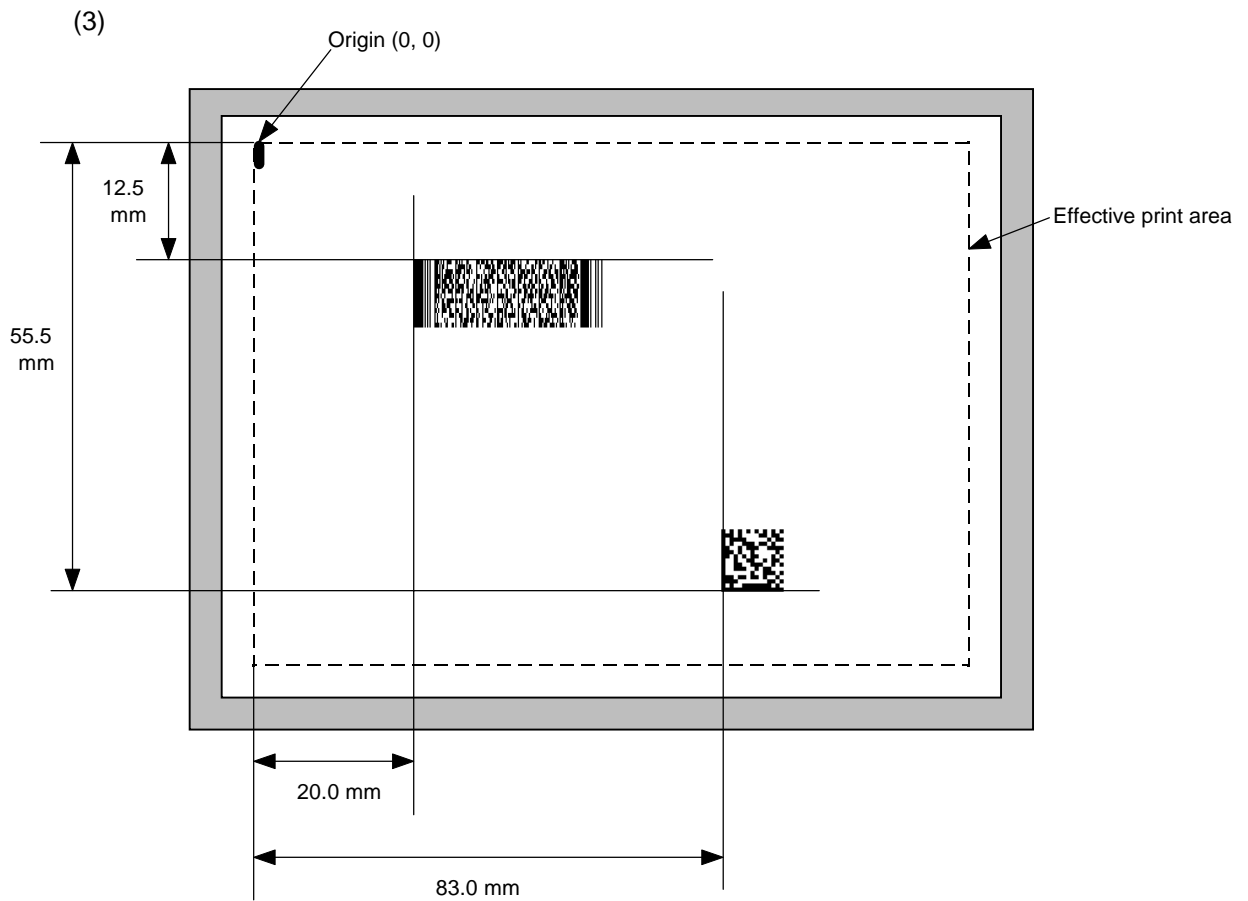
```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02"; LF$; NUL$;
30 PRINT #1, ESC$; "PV01; 0650, 0550, 0200, 0150, B, 33, B; 02"; LF$; NUL$;
40 PRINT #1, ESC$; "XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02"; LF$;
NUL$;
50 PRINT #1, ESC$; "RB; S"; LF$; "001"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "XB01; 0200, 0125, P, 04, 02, 03, 0, 0010"; LF$; NUL$;
30 PRINT #1, ESC$; "XB02; 0830, 0550, Q, 08, 04, 05, 3"; LF$; NUL$;
40 PRINT #1, ESC$; "RB01; PDF417"; LF$; NUL$;
50 PRINT #1, ESC$; "RB02; Data Matrix"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0002, 0002C6000"; LF$; NUL$;

```

6.16 ISSUE COMMAND

[ESC] XS

Function	Issue labels according to the print conditions programmed.
Format	[ESC] XS; I, aaaa, bbbcdefgh [LF] [NUL]
Term	<p>aaaa: Number of labels to be issued 0001 to 9999</p> <p>bbb: Cut interval. Designates the number of pieces to be printed before the backing paper is cut. 000 to 100 (no cut when 000)</p> <p>c: Type of sensor 0: No sensor 1: Reflective sensor 2: Transmissive sensor (when using normal labels) 3: Transmissive sensor (when using preprinted labels) 4: Reflective sensor (when using a manual threshold value)</p> <p>d: Issue mode C: Batch mode (cut issue, stop and cut, with back feed) D: Strip mode (with back feed) E: Strip mode (with back feed, the strip sensor is ignored, the applicator supports this mode.)</p> <p>e: Issue speed 3: 3"/sec. (1, 2, 4: 3"/sec.) 6: 6"/sec. (5, 7: 6"/sec.) A: 10"/sec. (8, 9: 10"/sec.)</p> <p>f: With/without ribbon 0: Without ribbon 1: With ribbon (with ribbon saving function) 2: With ribbon (without ribbon saving function) * With ribbon, transmissive/non-transmissive conforms to the system mode.</p> <p>g: Designates tag rotation. 0: Printing bottom first 1: Printing top first 2: Mirror printing bottom first 3: Mirror printing top first</p> <p>h: Type of status response 0: No status response 1: Status response</p>

Explanation	<p>(1) Number of labels to be issued</p> <p>① If increment/decrement is not specified, the designated number of pieces with the same drawing dot will be issued.</p> <p>② If increment /decrement is specified, the designated number of pieces will be issued while incrementing/decrementing the piece of the designated drawing area.</p> <p>* The increment/decrement designation is valid until the Image Buffer Clear Command ([ESC] C) is transmitted.</p>
-------------	---

(2) Cut interval

The cut interval is valid only when the cutter has been installed and the issue mode is "C". If an error occurs during an issue after the cut interval is designated, and then printing is restarted, the printer ejects the printed paper then resumes printing on the paper where the error occurred.

If no subsequent command is received from the PC for 3 seconds after cut-issuing the last label, when the cut interval is valid and DIP SW 1-5 is set to ON (with the automatic forward feed standby), the printer automatically performs a 10-mm forward feed.

When the Issue Command is received during the automatic forward feed standby, an issue is started after a reverse feed to the original position.

The power should not be turned off then on, or the printer should not be placed in a pause/reset state before the automatic forward feed, since the automatic forward feed is not performed when the paper is fed by turning the power off then on, or by pressing the [FEED] key of the printer in the pause/reset state.

If the paper is fed by pressing the [FEED] key of the printer during the forward feed standby, the printer feeds one label, cuts, performs the automatic forward feed then stops.

* For cutting the label having label pitch of 38 mm or less, refer to the section regarding the position fine adjustment.

(3) 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 every piece.

③ Transmissive sensor (when using normal labels):

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 reflective sensor and the paper position is finely adjusted every piece.

④ Transmissive sensor (when using preprinted labels):

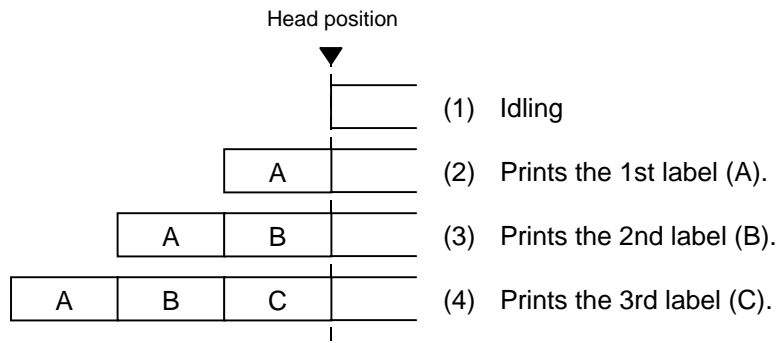
Printing takes place according to the parameter designated by the Label Size Set Command. However, the label-to-label gap is automatically sensed by the transmissive sensor and the paper position is finely adjusted every piece according to the value set by the threshold set operation (key operation).

⑤ Reflective sensor (when using a manual threshold value)

Printing takes place according to the parameters designated by the Label Size Set Command. However, the black mark provided on the back of the tag paper is automatically sensed by the reflective sensor and the paper position is finely adjusted every piece, according to the set threshold setting value (set using keys).

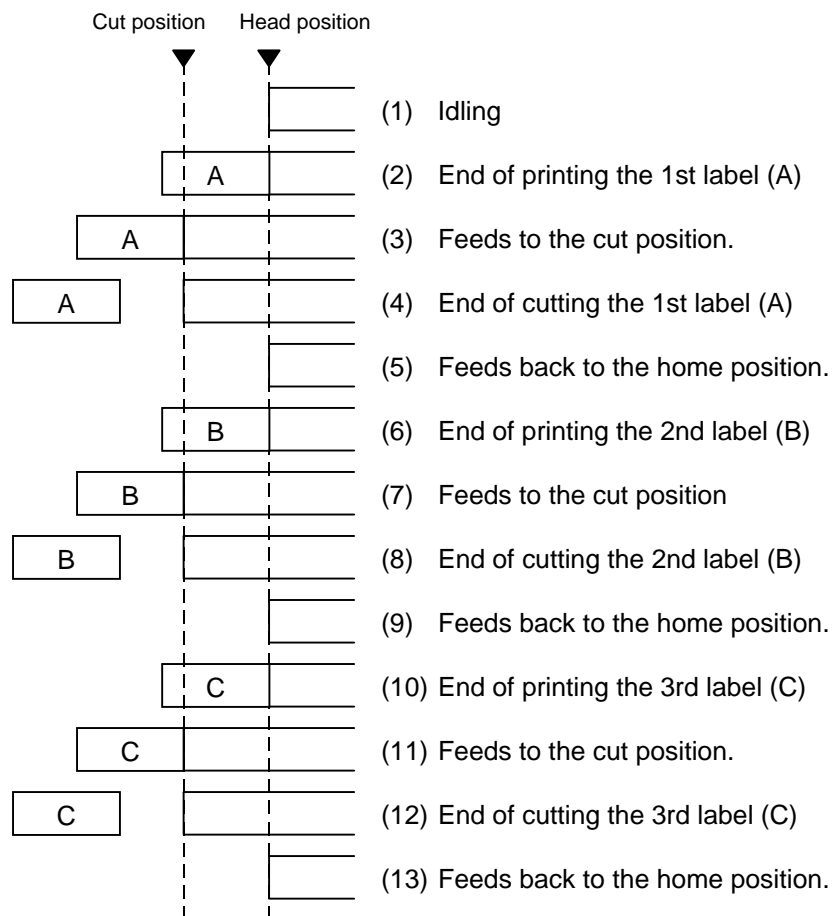
(4) Issue mode

[Batch mode (cut interval 0)]



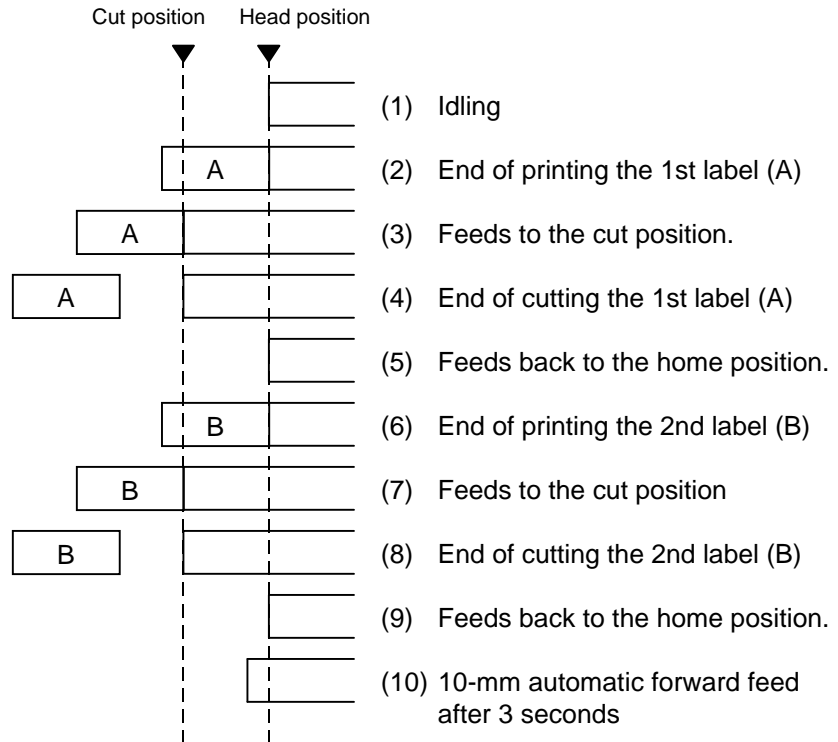
[Batch mode (other than cut interval 0)]

- When DIP SW1-5 is turned off (without the automatic forward feed standby):



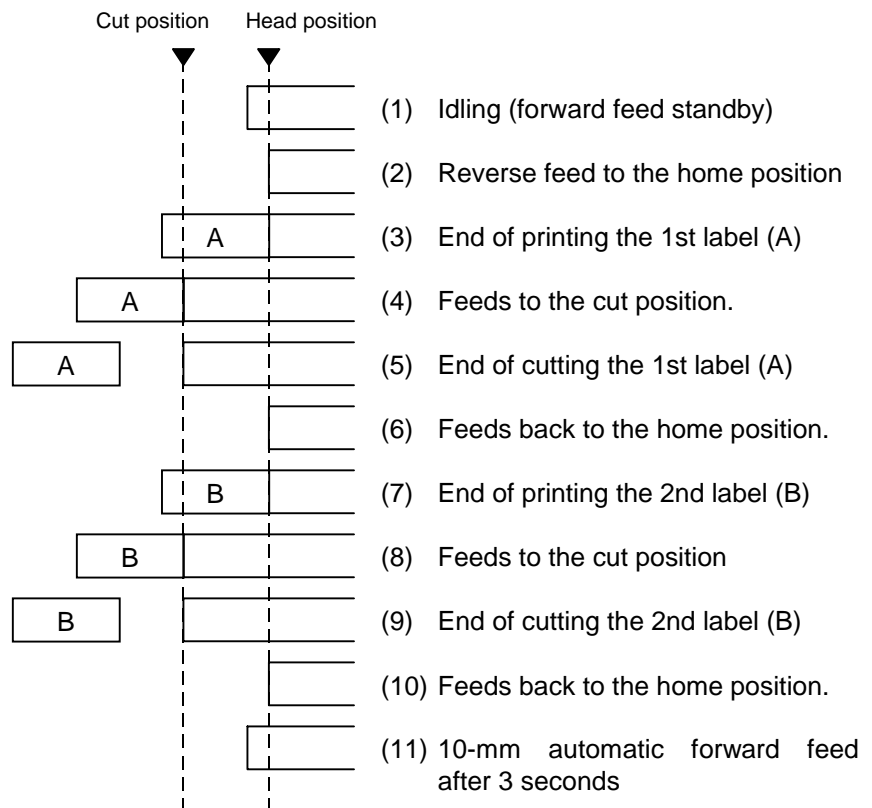
[Batch mode (cut interval 1, 2 labels to be issued)]

- When DIP SW1-5 is turned on (with the automatic forward feed standby):

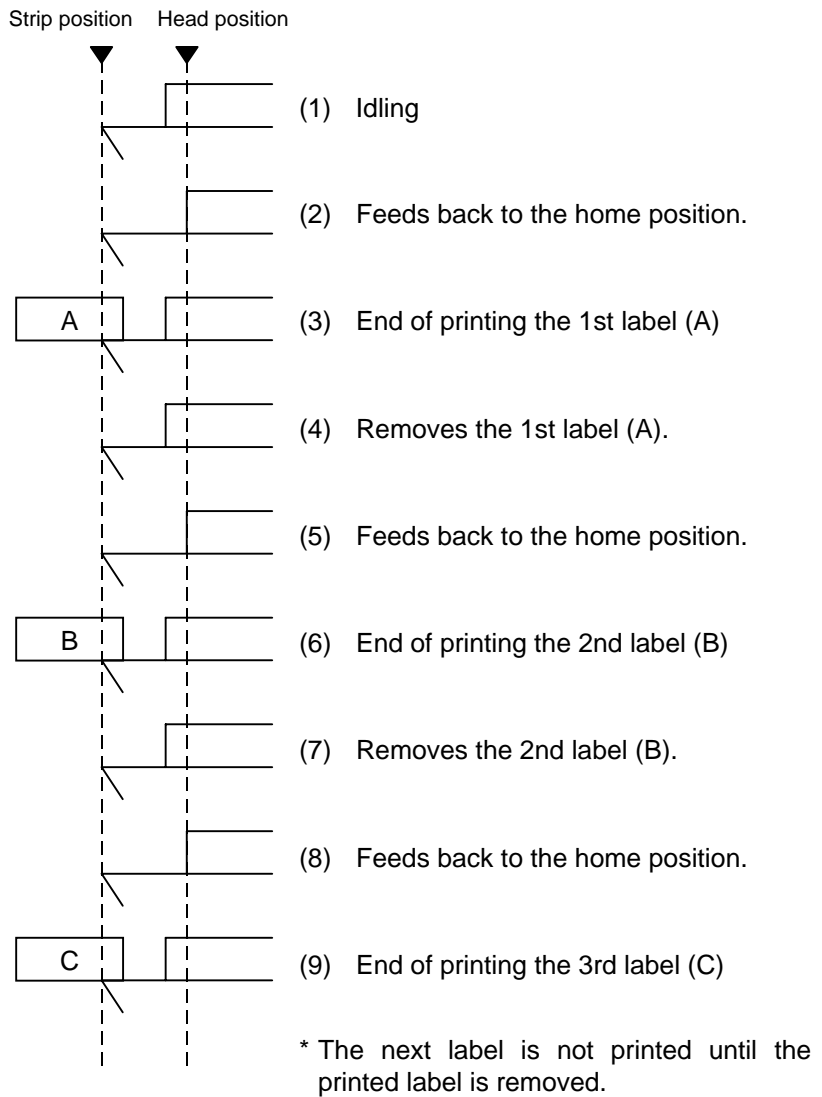


[Batch mode (cut interval 1, 2 labels to be issued) During forward feed standby]

- When DIP SW1-5 is turned on (with the automatic forward feed standby):



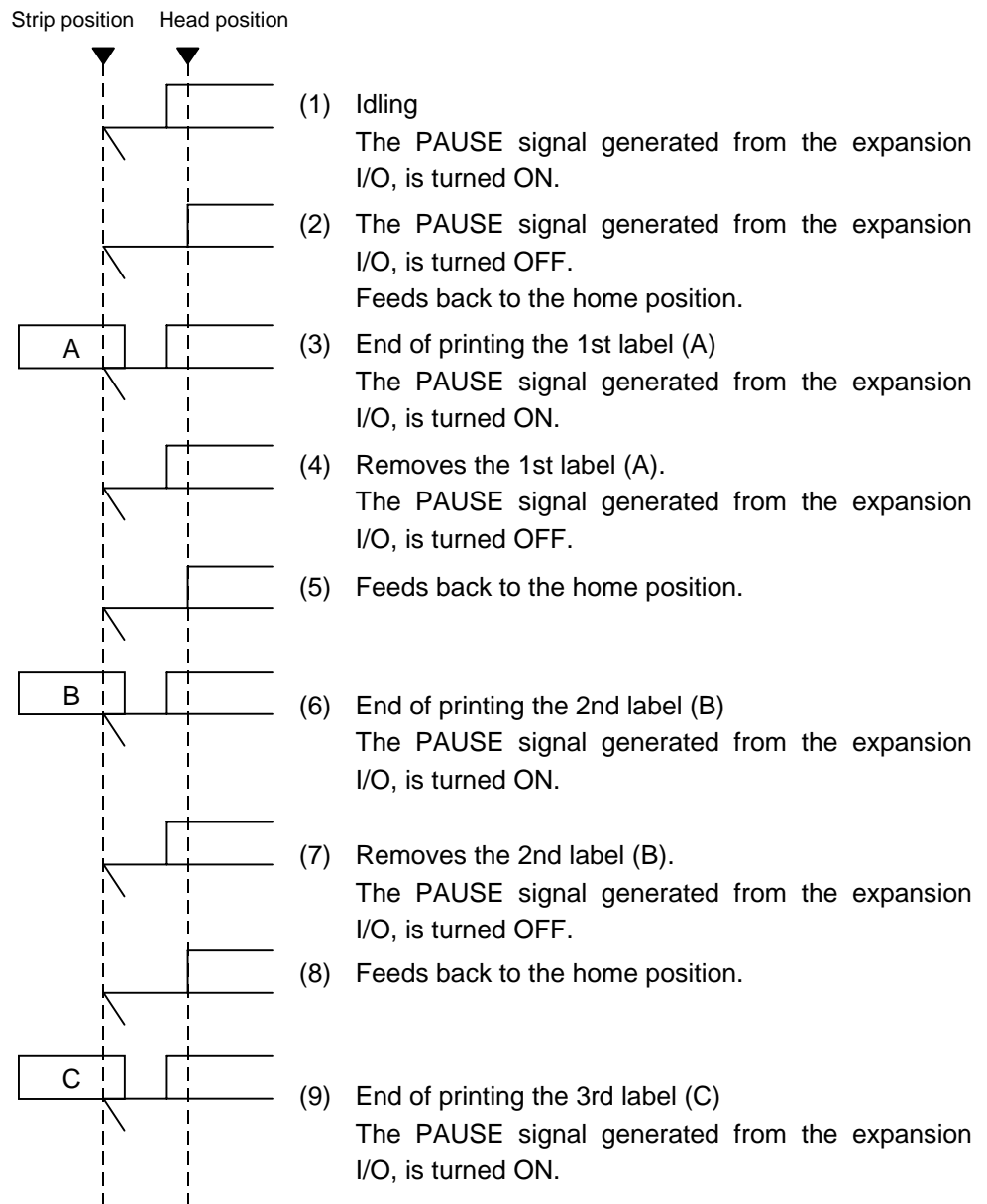
[Strip mode (Issue mode: D)]



[Strip mode (Issue mode: E)]

The expansion I/O is installed:

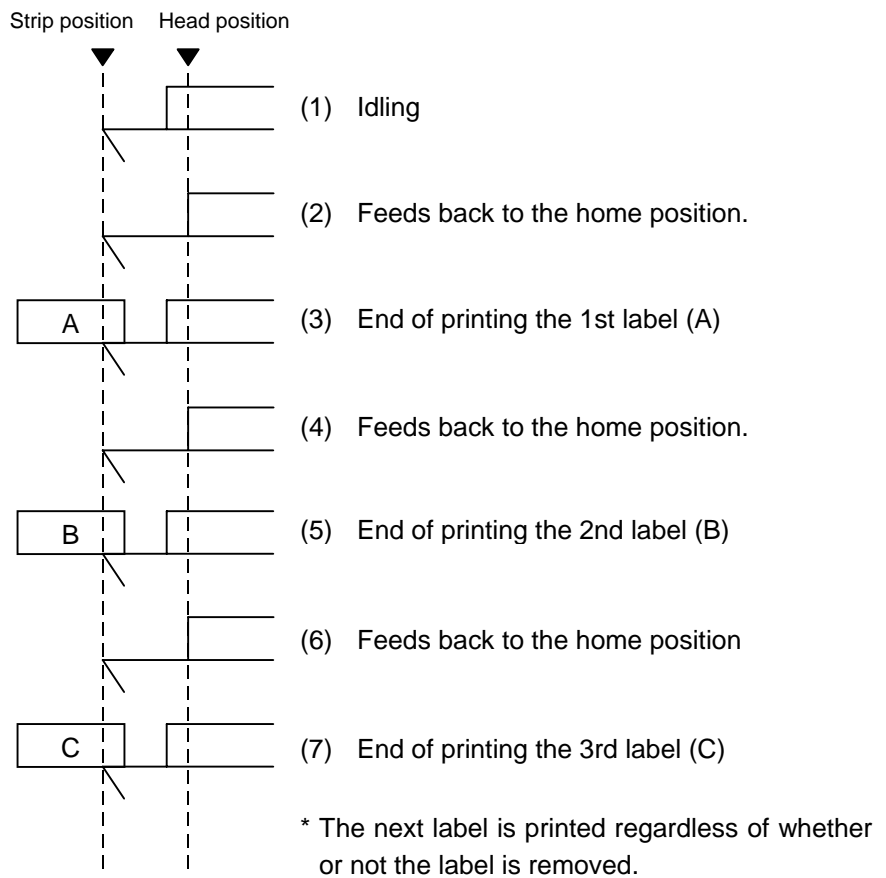
The strip sensor is ignored. An issue is performed by checking a PAUSE signal generated from the expansion I/O.



* When the PAUSE signal generated from the expansion I/O is on, a label is not printed.

The expansion I/O is not installed:

The strip sensor is ignored, an issue is performed.



- *1 Issue mode E is different from issue mode D. In issue mode E, a label is issued regardless of the strip sensor, and whether or not a label to be stripped, is placed.
- *2 The peripheral device such as an applicator, must control the PAUSE signal generated from the expansion I/O.
- *3 If the issue count is set to 2 or more to issue labels when the expansion I/O has been installed, the printer issues the specified number of labels while the PAUSE signal generated from the expansion I/O is off.
- *4 If the issue count is set to 2 or more to issue labels when the expansion I/O has not been installed, the specified number of labels is issued.

(5) Issue speed

Printing takes place at the designated speed. Ribbon saving and back feed also take place at the same designated speed. However, the back feed speed in cut mode and strip mode is 3"/sec.

Model Parameter	B-472
1	3"/sec
2	
3	
4	
5	6"/sec
6	
7	
8	10"/sec
9	
A	

(6) With/without ribbon

Without ribbon: Use direct thermal paper.

With ribbon: Use thermal transfer ribbon.

With ribbon saving:

- When there is the following non-print area (in the feed direction) in batch mode, cut mode or strip mode, ribbon saving is performed automatically.

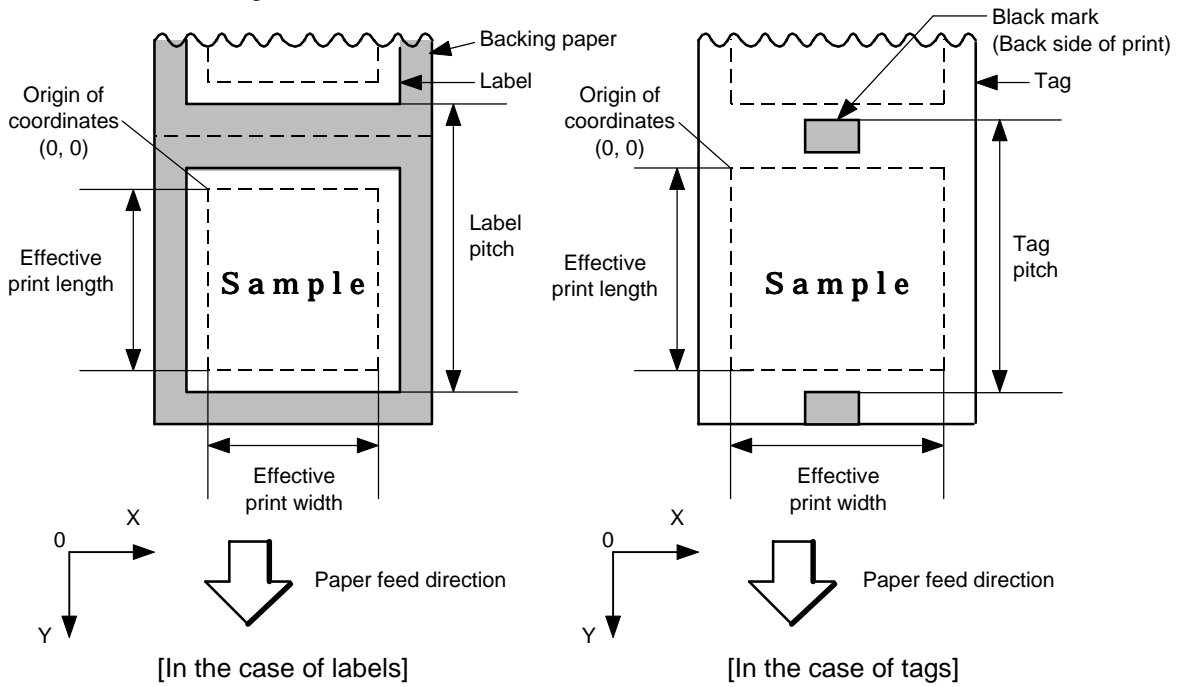
3"/sec., 6"/sec.:	20 mm or more
10"/sec.:	30 mm or more

- The minimum print area (in the feed direction) in ribbon saving issue is 8 mm. When the print area is less than 8 mm, printing is performed by automatically assuming the minimum print area of 8 mm.
- Ribbon saving is performed for up to 4 fields (4 printing fields + 4 ribbon saving fields).
- When the ribbon saving issue is performed, on-the-fly issue is not performed regardless of data quantity or print length.
- "Without ribbon saving function" is selected in the Issue Command parameter setting or in DIP switch setting, no ribbon saving will take place.

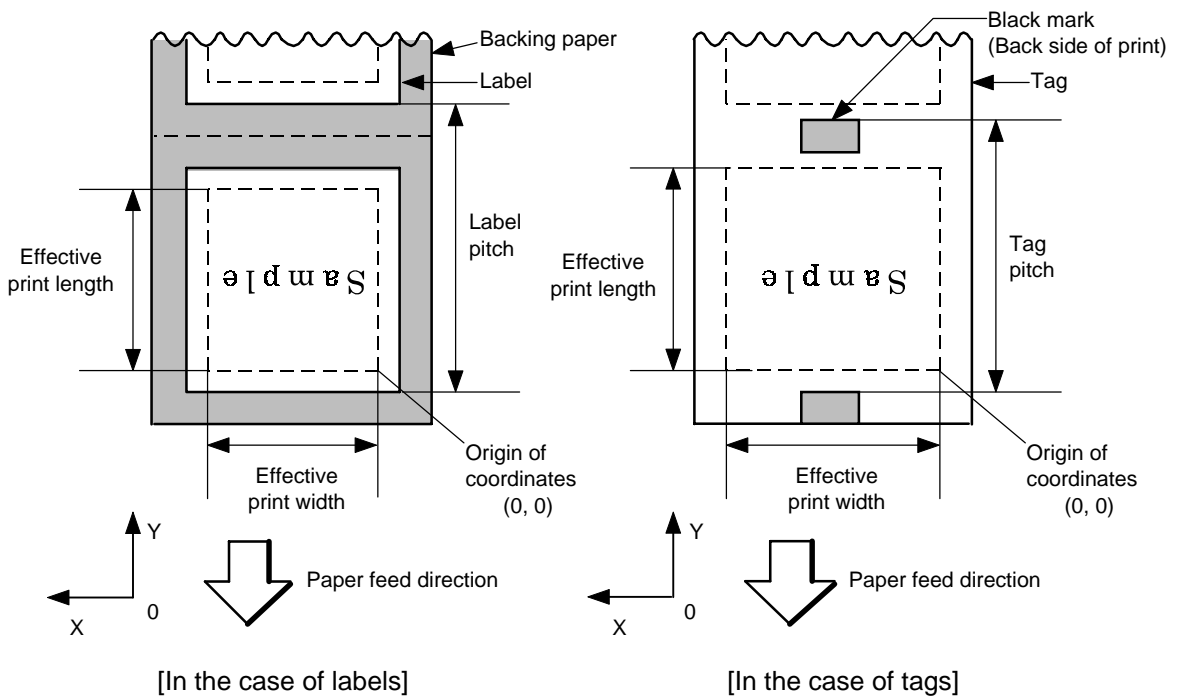
(7) Tag rotation

The origin of coordinates and printing direction vary according to the designation of tag rotation.

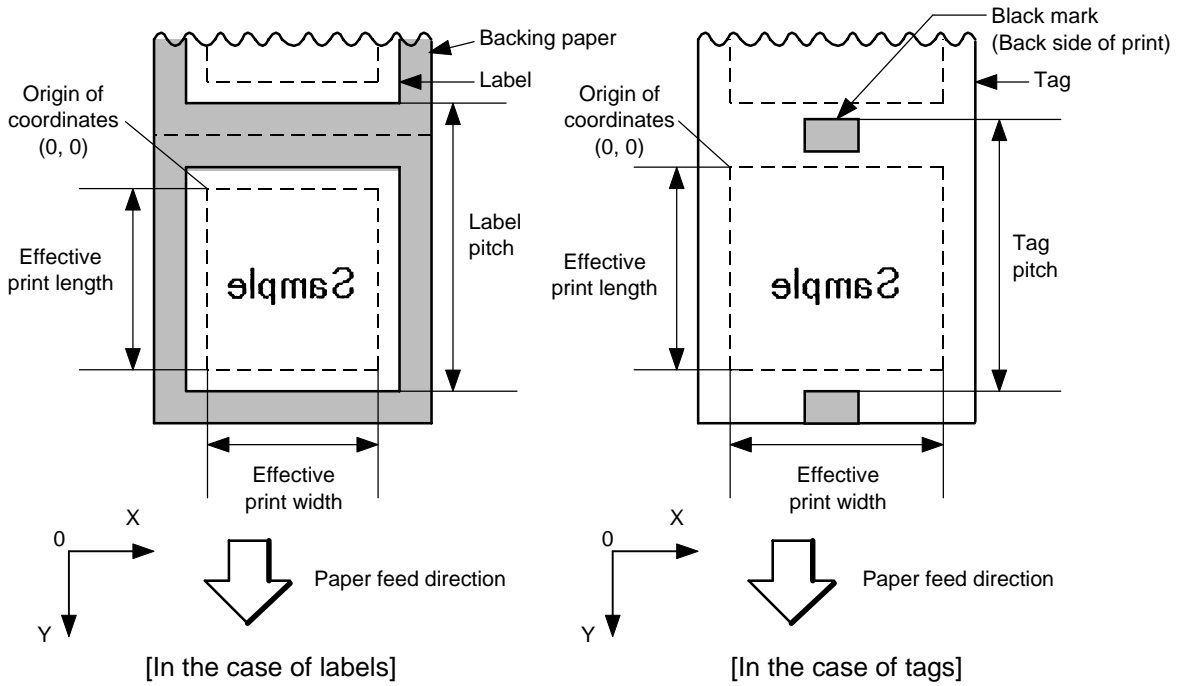
① Printing bottom first



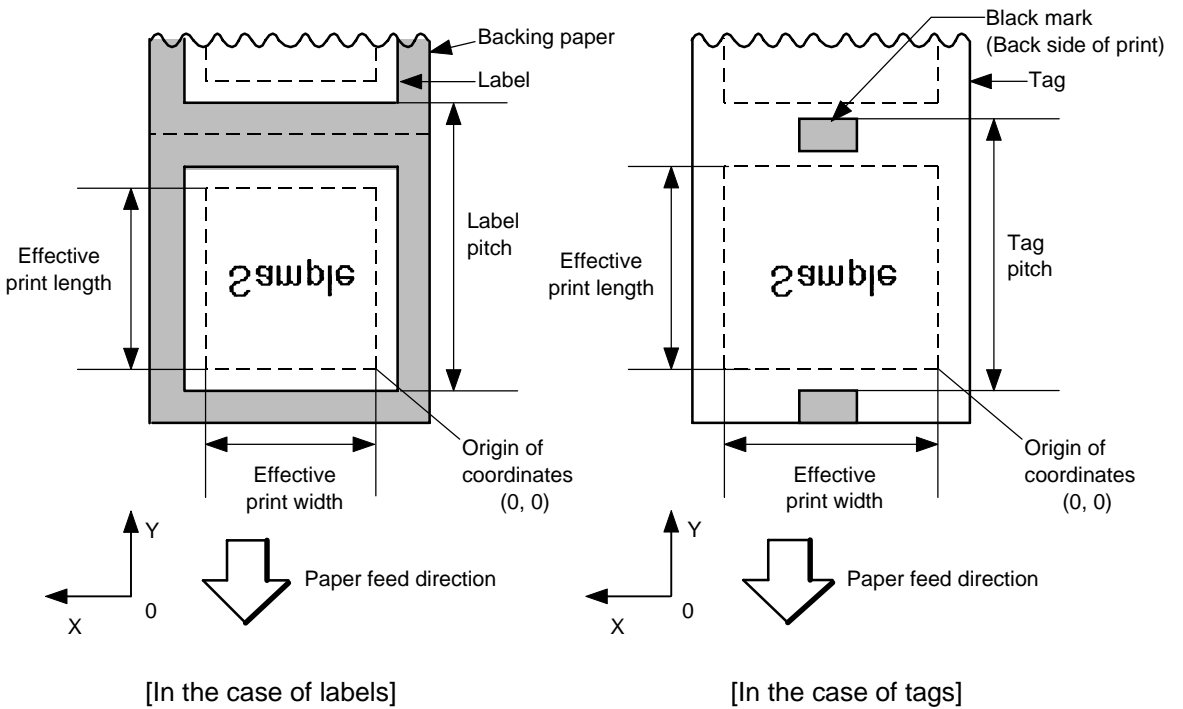
② Printing top first



③ Mirror printing bottom first



④ Mirror printing top first



(8) Status response

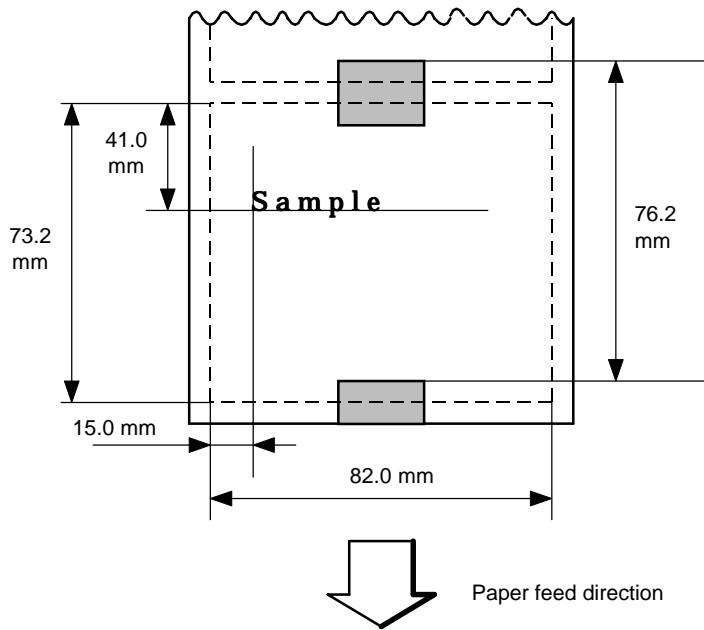
When the option with status response has been selected, a status response is made at the end of printing or if an error occurs.

In batch mode and cut mode, the print end status response is made after printing on the designated number of labels.

In strip mode, the status response is made after printing one label.

* Do not change the parameter for status response/no status response during printing. Otherwise the status response may not be performed properly.

Examples



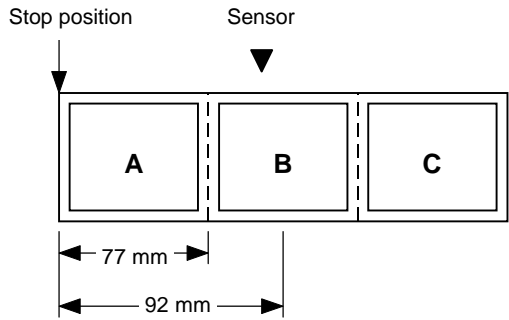
- Issue count: 4 pieces
- Cut interval: 1 piece
- Paper: Tag paper (Reflective sensor used)
- Issue mode: Cut issue
- Issue speed: 6"/sec.
- Ribbon: With
- Status response: On

```
10 PRINT #1, ESC$; "D0762, 0820, 0732"; LF$; NUL$;  
20 PRINT #1, ESC$; "T11C62"; LF$; NUL$;  
30 PRINT #1, ESC$; "C"; LF$; NUL$;  
40 PRINT #1, ESC$; "PC001; 0150, 0410, 1, 1, A, 00, B"; LF$; NUL$;  
50 PRINT #1, ESC$; "RC001; Sample"; LF$; NUL$;  
60 PRINT #1, ESC$; "XS; I, 0004, 0011C6201"; LF$; NUL$;
```

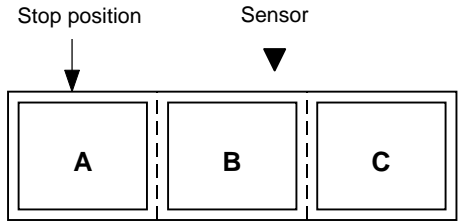
Notes

Improvement of the processing to stop the label at the home position:

When the gap between labels (black mark) is found after the head open state is detected, the value to stop at the home position of each label between the head and the sensor is set again.

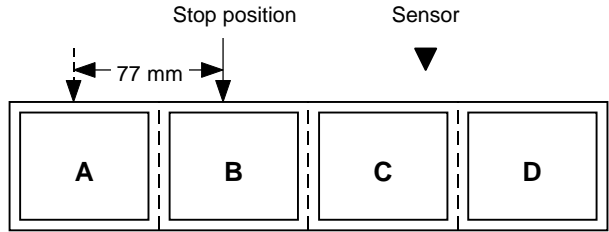


- The paper is moved in the above state.

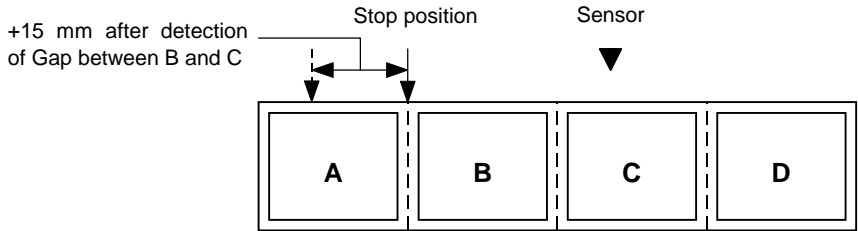


- Stop position after feeding one label

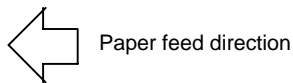
<< Before improvement >>



<< After improvement >>



* However, an error will result when feed jam conditions are met.



6.17 FEED COMMAND

[ESC] T

Function	Feeds the paper.
Format	[ESC] Tabcde [LF] [NUL]
Term	<p>a: Type of sensor</p> <ul style="list-style-type: none">0: No sensor1: Reflective sensor2: Transmissive sensor (when using normal labels)3: Transmissive sensor (when using preprinted labels)4: Reflective sensor (when using a manual threshold value) <p>b: Selects cut or non-cut</p> <ul style="list-style-type: none">0: Non-cut1: Cut <p>c: Feed mode</p> <ul style="list-style-type: none">C: Batch mode (cut issue, stop and cut, with back feed)D: Strip mode (with back feed)E: Strip mode (with back feed, the strip sensor is ignored, the applicator supports this mode.) <p>d: Feed speed</p> <ul style="list-style-type: none">3: 3"/sec. $\left(\begin{array}{l} 1, 2, 4: 3"/sec. \\ 5, 7: 6"/sec. \\ 8, 9: 10"/sec. \end{array} \right)$6: 6"/sec.A: 10"/sec. <p>e: With/without ribbon</p> <ul style="list-style-type: none">0: Without ribbon1: With ribbon (with ribbon saving function)2: With ribbon (without ribbon saving function) <p>* With ribbon, transmissive/non-transmissive conforms to the system mode.</p>

Explanation	<p>(1) Type of sensor</p> <ul style="list-style-type: none">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 (when using normal labels): 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 reflective sensor and the stop position is finely adjusted.④ Transmissive sensor (when using preprinted labels): 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 according to the value set by the threshold set operation (key operation).
-------------	---

⑤ Reflective sensor (when using a manual threshold value)

Feeding takes place according to the parameters designated by the Label Size Set Command. However, the black mark provided on the back of the tag paper is automatically sensed by the reflective sensor and the paper position is finely adjusted every piece, according to the set threshold setting value (set using keys).

(2) Cut/non-cut

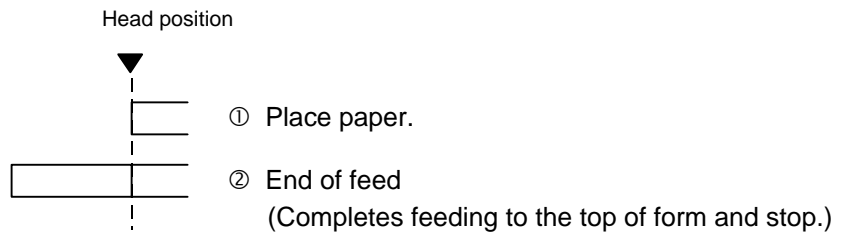
This option is valid in batch feed mode only. (Non-cut is selected in strip mode.)
 If no subsequent command is received from the PC for 3 seconds after cut-feeding when DIP SW1-5 is set to ON (with the automatic forward feed standby) in cut mode, the printer automatically performs a 10-mm forward feed.
 When the Feed Command is received in the forward feed standby state, the printer performs a reverse feed to the original position.

* For notes, refer to the section regarding the Issue Command.

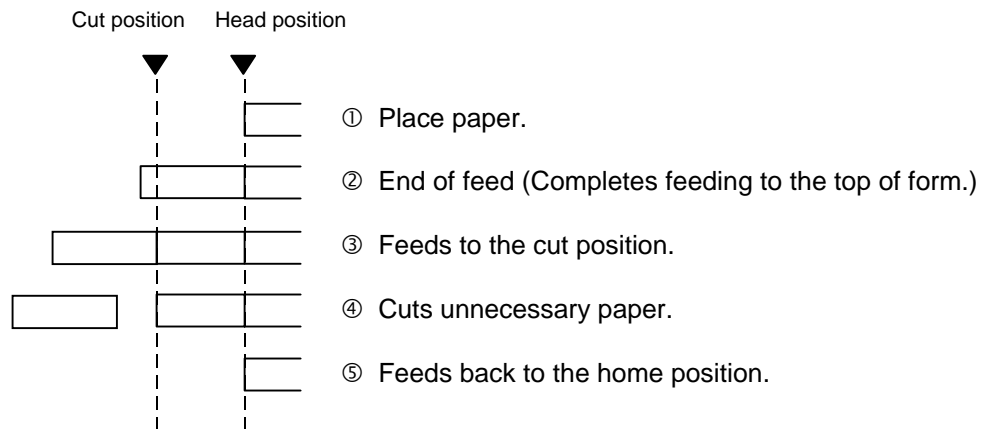
For cutting the label having label pitch of 38 mm or less, refer to the section regarding the Position Fine Adjustment Command.

(3) Feed mode

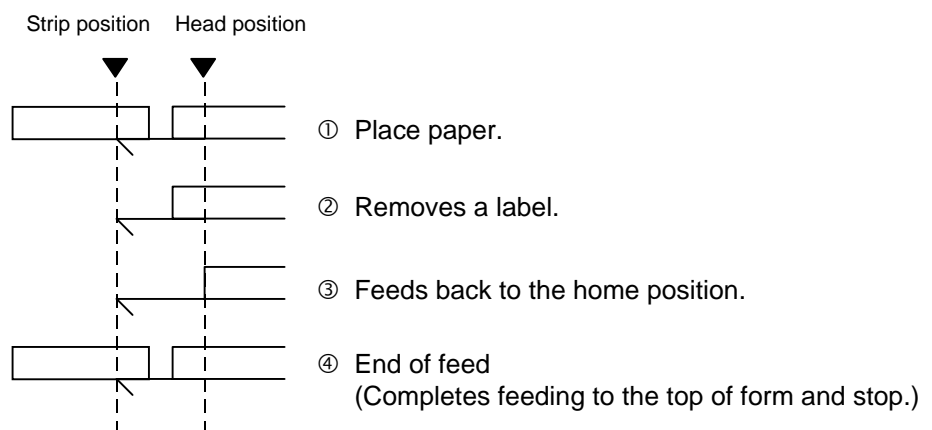
[Batch (non-cut)]



[Batch (cut)]



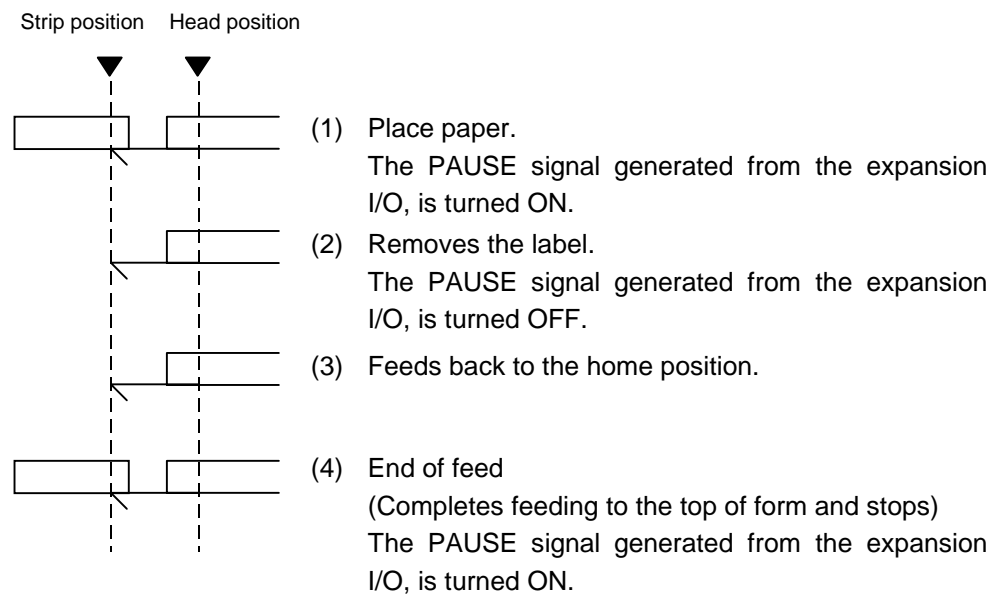
[Strip (Feed mode: D)]



[Strip (Feed mode: E)]

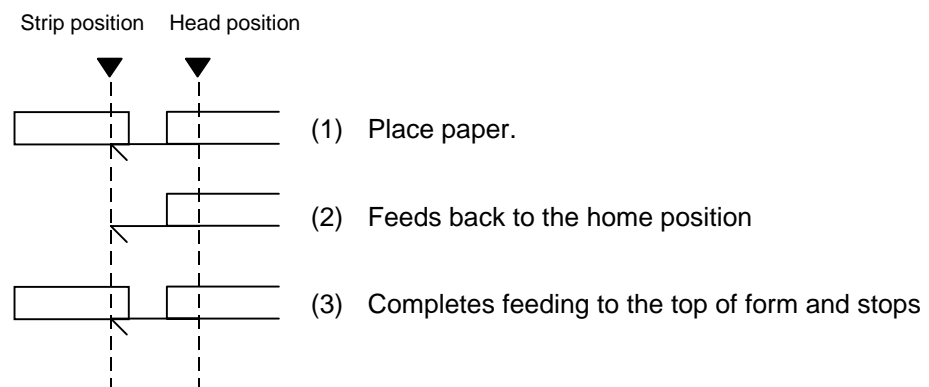
Expansion I/O is installed:

The strip sensor is ignored. A feed is performed by checking a PAUSE signal generated from the expansion I/O.



Expansion I/O is not installed:

The strip sensor is ignored. A feed is performed.



*1 Feed mode E is different from feed mode D. In feed mode E, a label is fed, regardless of the strip sensor, and whether or not a label to be stripped, is placed.

*2: The peripheral device such as an applicator, must control the PAUSE signal generated from the expansion I/O.

(4) Feed speed

- Feed the paper at the designated speed. Ribbon saving and back feed also take place at the same designated speed. However, the back feed speed in cut mode or strip mode is 3"/sec.

Parameter \ Model	B-472
1	3"/sec
2	
3	
4	
5	6"/sec
6	
7	
8	10"/sec
9	
A	

(5) With/without ribbon

Without ribbon: The ribbon motor is not operated at feed.

With ribbon: The ribbon motor is operated at feed.

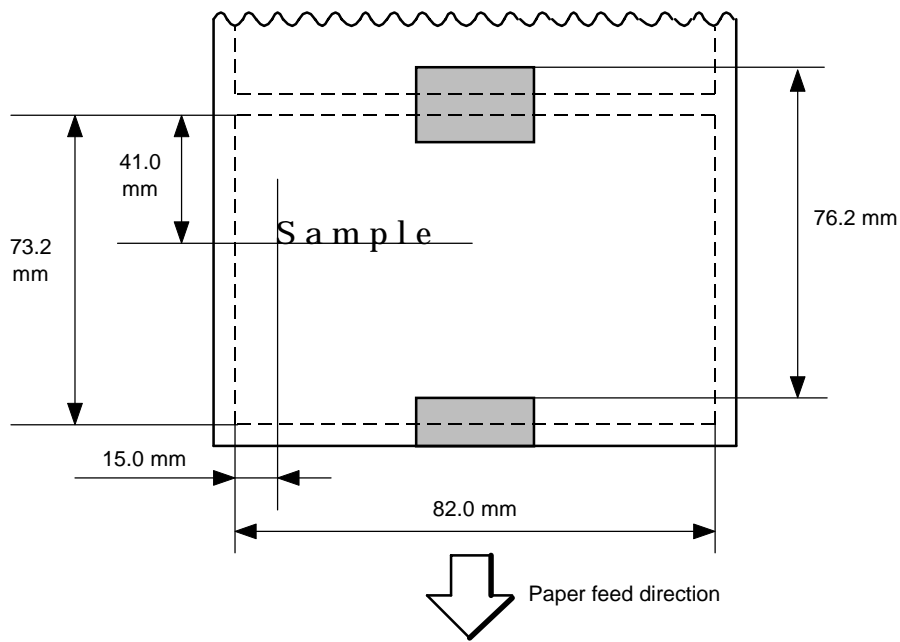
With ribbon saving: When the DIP switch is set to auto ribbon saving, ribbon saving will be performed automatically.

When the option for no ribbon saving has been selected or the DIP switch is set to no auto ribbon saving, no ribbon saving will take place.

Notes

- (1) If a change of label size or type of sensor, feed fine adjustment, cut position fine adjustment (or strip position fine adjustment) or back feed fine adjustment is made, one label must be fed to adjust the first printing position prior to printing.
- (2) The parameter of the Feed Command is protected in memory (protected even if the power is turned off).
- (3) When "status response" is selected in the Issue Command parameter setting, a status response is made after the end of feed or when an error occurs.
- (4) For explanation about the processing to stop the label at the home position, refer to the section regarding the Issue Command.

Examples



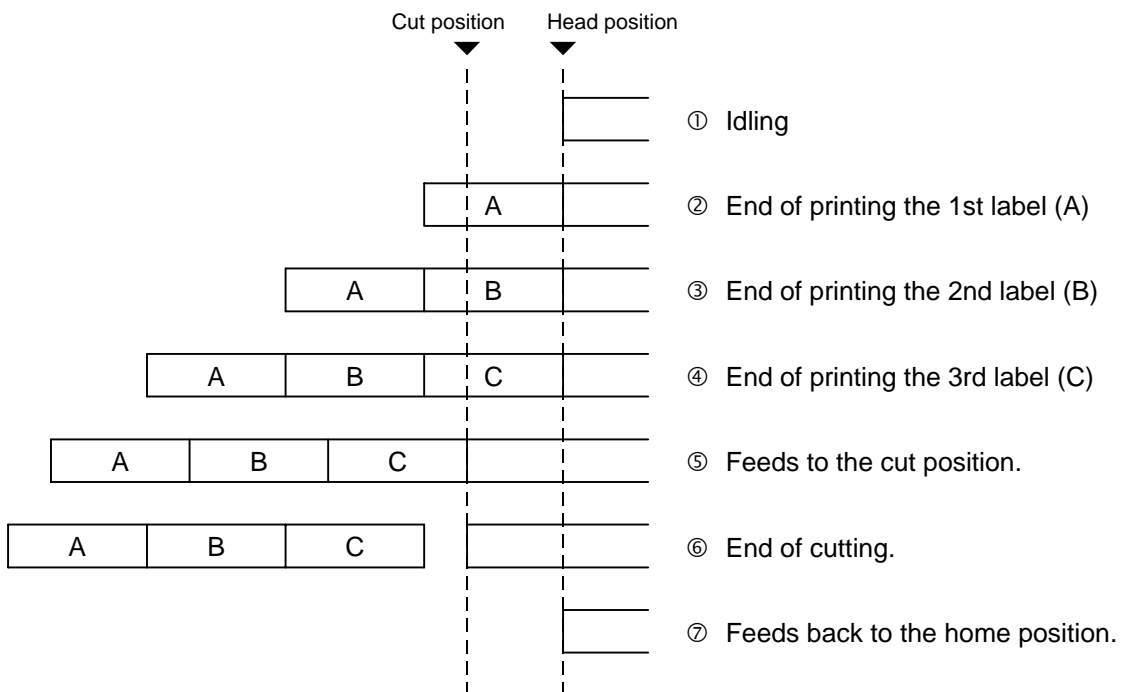
```
10 PRINT #1, ESC$; "D0762, 0820, 0732"; LF$; NUL$;  
20 PRINT #1, ESC$; "AX; +010, +000, +10"; LF$; NUL$;  
30 PRINT #1, ESC$; "T11C62"; LF$; NUL$;  
40 PRINT #1, ESC$; "C"; LF$; NUL$;  
50 PRINT #1, ESC$; "PC001; 0150, 0410, 1, 1, A, 00, B"; LF$; NUL$;  
60 PRINT #1, ESC$; "RC001; Sample"; LF$; NUL$;  
70 PRINT #1, ESC$; "XS; I, 0004, 0011C6201"; LF$; NUL$;
```


6.18 EJECT COMMAND

[ESC] IB

Function	Ejects (Cuts) the label presently remaining between the head and the cutter and returns to the original position.
Format	[ESC] IB [LF] [NUL]
Notes	<p>If no subsequent command is received from the PC for 3 seconds after ejection when DIP SW1-5 is set to ON (with the automatic forward feed standby), the printer automatically performs a 10-mm forward feed.</p> <p>When the Eject Command is received in the forward feed standby state, the printer feeds the label in reverse to the original position and ejects it.</p> <p>* For notes, refer to the section regarding the Issue Command. For ejecting the label having label pitch of 38 mm or less, refer to the section regarding the position fine adjustment.</p>

Examples



```

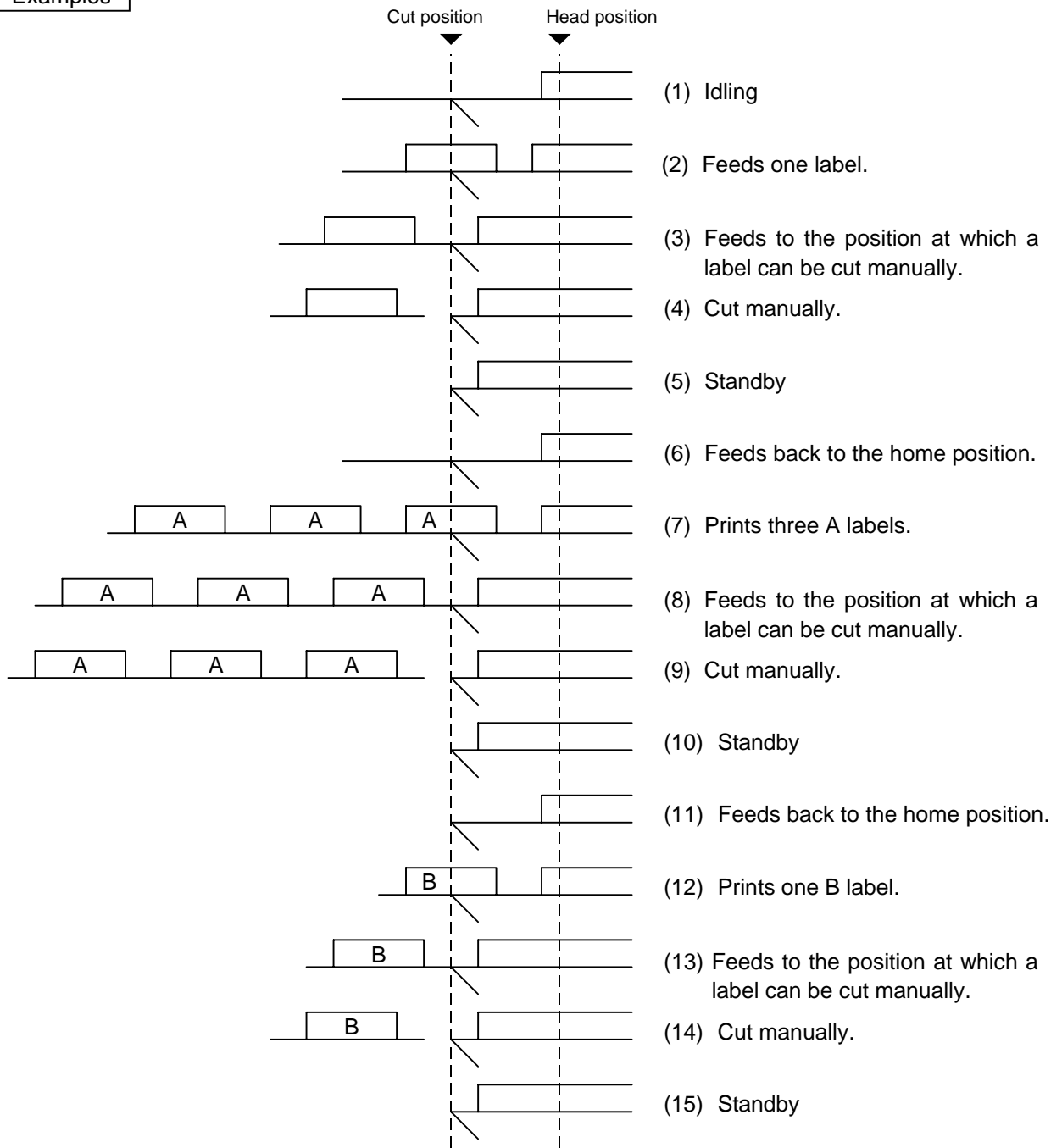
10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "PC001; 0200, 01250, 1, 1, A, 00, B"; LF$; NUL$;
30 PRINT #1, ESC$; "RC001; A"; LF$; NUL$;
40 PRINT #1, ESC$; "XS; I, 0001, 0001C6201"; LF$; NUL$;
50 PRINT #1, ESC$; "RC001; B"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0001, 0001C6201"; LF$; NUL$;
70 PRINT #1, ESC$; "RC001; C"; LF$; NUL$;
80 PRINT #1, ESC$; "XS; I, 0001, 0001C6201"; LF$; NUL$;
90 PRINT #1, ESC$; "IB"; LF$; NUL$;
    
```

6.19 FORWARD/REVERSE FEED COMMAND

[ESC] U1, [ESC] U2

Function	After printing or feeding the paper, feeds the paper to a manually cut position. When issuing the next label, feeds the paper back to the first printing position.
Format	Forward Feed [ESC] U1; aaaa [LF] [NUL] Reverse Feed [ESC] U2; aaaa [LF] [NUL]
Term	aaaa: Feed value by which the paper is fed forward or backward. 0030 to 2000 (in 0.1 mm units)
Notes	<ol style="list-style-type: none">(1) When the [FEED] key is pressed on the printer, one label is fed, and then fed by the forward feed value automatically if the Forward Feed Command has already been transmitted.(2) The Forward/Reverse Feed Command is protected in memory (protected even if the power is turned off).(3) The Forward/Reverse Feed Command is ignored in strip mode and cut issue mode.(4) The Forward/Reverse Feed Command feeds the label without ribbon saving even if the ribbon saving issue is designated.(5) The forward feed is performed at the speed designated in the Issue Command or Feed Command. The reverse feed is performed at the speed of 3"/sec.

Examples



```

10 PRINT #1, ESC$; "T20C62"; LF$; NUL$;
20 PRINT #1, ESC$; "U1; 0120"; LF$; NUL$;
   Cut manually.
30 PRINT #1, ESC$; "U2; 0120"; LF$; NUL$;
40 PRINT #1, ESC$; "RC001; A"; LF$; NUL$;
50 PRINT #1, ESC$; "XS; I, 0003, 0002C6201"; LF$; NUL$;
60 PRINT #1, ESC$; "U1; 0120"; LF$; NUL$;
   Cut manually.
70 PRINT #1, ESC$; "U2; 0120"; LF$; NUL$;
80 PRINT #1, ESC$; "RC001; B"; LF$; NUL$;
90 PRINT #1, ESC$; "XS; I, 0001, 0002C6201"; LF$; NUL$;
100 PRINT #1, ESC$; "U1; 0120"; LF$; NUL$;

```

6.20 FORMAT COMMAND

[ESC] J1

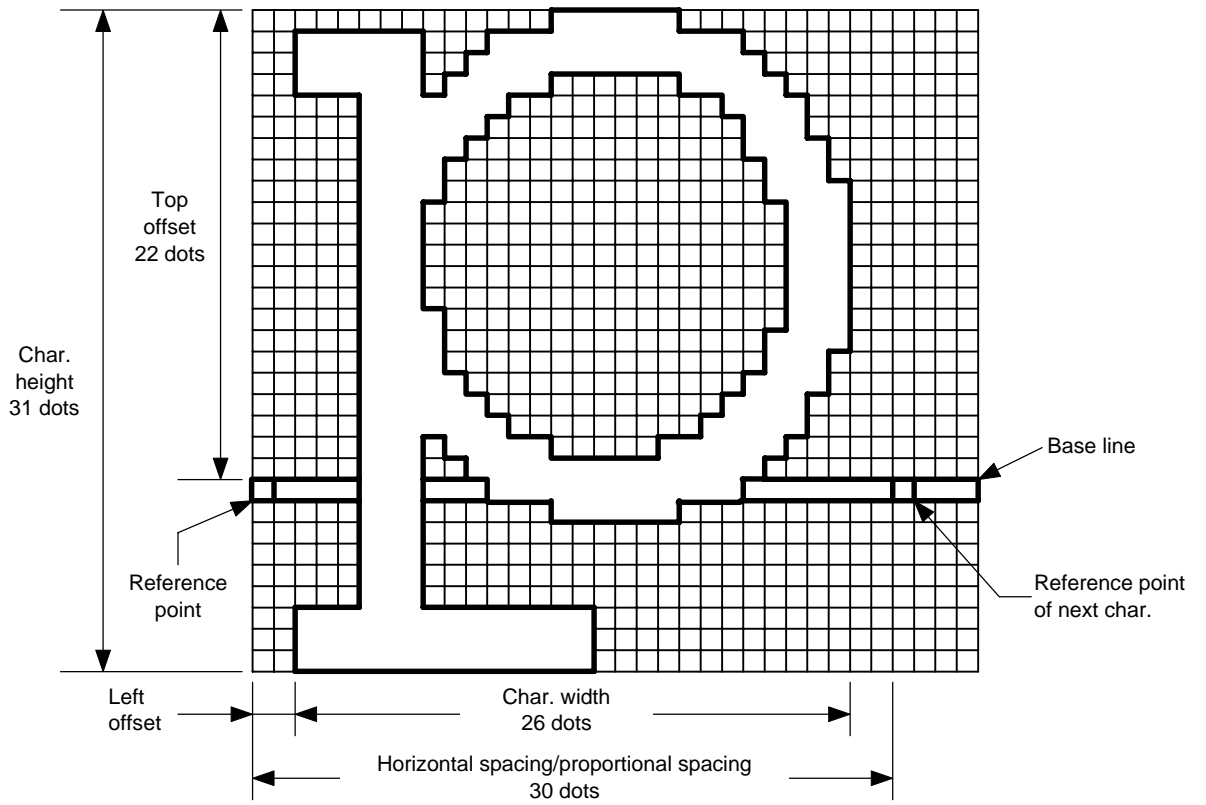
Function	Formats (Initializes) the flash memory card.
Format	[ESC] J1; a [LF] [NUL]
Term	a: Formatting (Initializing) range A: All area of flash memory card B: PC save area of flash memory card C: Writable character area of flash memory card
Explanation	<ol style="list-style-type: none">(1) The flash memory card can be roughly divided into the PC save area and writable character area. They can be formatted (initialized) either separately or at the same time.(2) When using a new flash memory card, the area to be used must be formatted (initialized) and then the PC save or writable characters must be stored.(3) After formatting, the remaining memory is the PC save area (255 Kbytes) and writable character area (715 Kbytes). However, when the 4-Mbyte flash memory card is used, the remaining memory is the PC save area (895 Kbytes) and writable character area (3147 Kbytes). The remaining memory is displayed on the LCD.(4) When storing already stored data (PC save, writable characters, logo) again, memory is consumed with every storing unless the Format Command ([ESC] J1) is transmitted.(5) When performing the label issue operation after sending the Format Command, the image buffer is automatically cleared.(6) When storing of writable characters, logos, or PC interface commands is not continued, the printer automatically enters the online mode (label issue operation) after about 10 seconds. In this case, the image buffer is automatically cleared.
Refer to	<ul style="list-style-type: none">• Bit Map Writable Character Command ([ESC] XD)• Save Start Command ([ESC] XO)• Save Terminate Command ([ESC] XP)
Example	10 PRINT #1, ESC\$; "J1; A"; LF\$; NUL\$;

6.21 BIT MAP WRITABLE CHARACTER COMMAND [ESC] XD

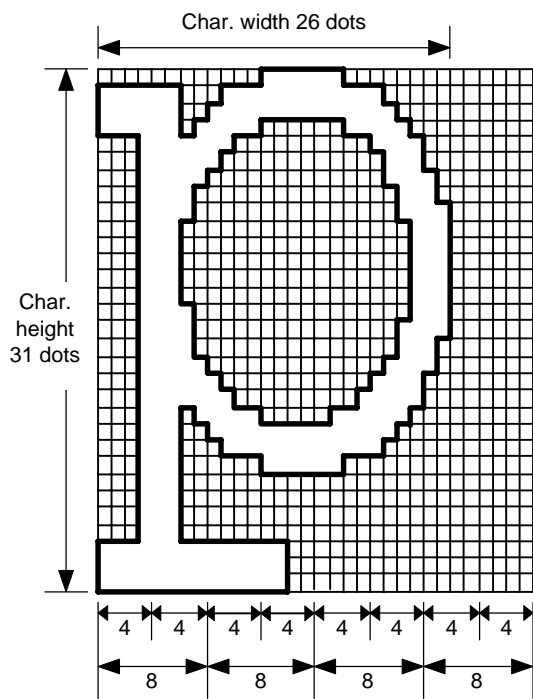
Function	Writes writable characters and logo on the flash memory card.
Format	[ESC] XD; aa, b, ccc, ddd, eee, fff, ggg, h, iii ----- iii [LF] [NUL]
Term	aa: Writable character set 01 to 40 b: Writable character code 20H to FFH (Set in hex.) ccc: Left offset 000 to 719 (in dots) ddd: Top offset 000 to 719 (in dots) eee: Character width 001 to 720 (in dots) fff: Character height 001 to 720 (in dots) ggg: Horizontal spacing/proportional spacing 000 to 999 (in dots) h: Type of writable character data 0: Nibble mode (4 bits/byte) 1: Hex. mode (8 bits/byte) iii --- iii: Writable character data to be stored

Explanation	(1) Type of writable character Up to 40 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. (2) Character code Up to 224 characters can be stored per character set. The maximum number of characters in 40 sets × 224 characters = 8960 characters. It varies depending on the writable character size and number of characters because of the limited memory capacity.
-------------	---

(3)



(4)



Nibble mode							
1	30H	2	30H	3	30H	4	3FH
5	3CH	6	30H	7	30H	8	30H
9	3FH	10	3CH	11	37H	.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
.		.		.		.	
							240 30H
241	3FH	242	3FH	243	3FH	244	3CH
245	30H	246	30H	247	30H	248	30H

Hex. mode			
1	00H	2	0FH
3	C0H	4	00H
5	FCH	6	7FH
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
.		.	
			120 00H
241	FFH	242	FCH
243	00H	244	00H

[Nibble mode]

- (1) The writable character data to be stored is separated into four dot units and sent in the following order (**1** → **248**). (high order digit: "3")
- (2) The data of writable characters to be stored is 30H to 3FH.
- (3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.
- (4) The data count of writable characters to be stored must be as follows:
Data count of writable characters to be stored =
 $\{(No. \text{ of char. width dots} + 7)/8\} \times No. \text{ of char. height dots} \times 2$
* The value in the brackets is rounded down to the nearest whole number.

[Hex. mode]

- (1) The writable character data to be stored is separated into eight dot units and sent in the following order (**1** → **124**).
- (2) The data of writable characters to be stored is 00H to FFH.
- (3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.
- (4) The data count of writable characters to be stored must be as follows:
Data count of writable characters to be stored =
 $\{(No. \text{ of char. width dots} + 7)/8\} \times No. \text{ of char. height dots}$
* The value in the brackets is rounded down to the nearest whole number.

Notes

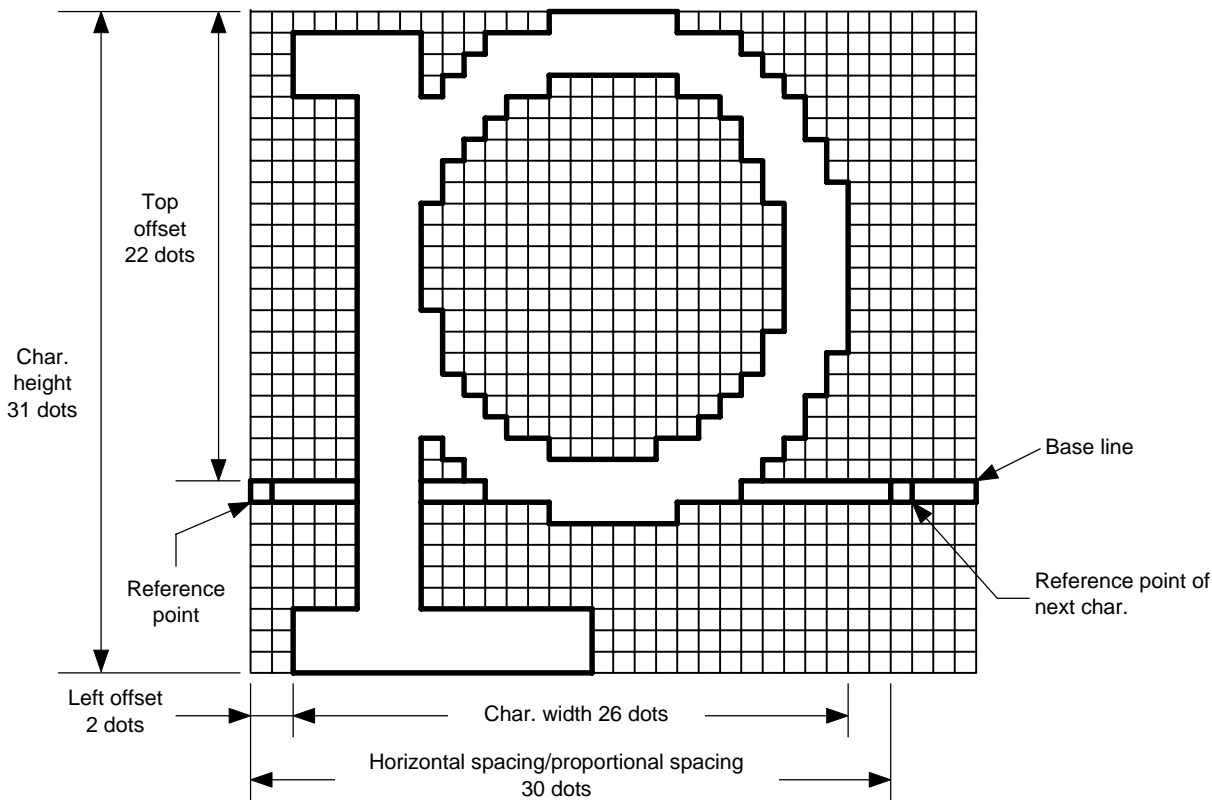
- (1) With the same writable character set designated, character width and character height can be designated for each writable character code. In other words, character size can be changed for each character, thus saving memory.
- (2) Proportional spacing and descending of characters are possible according to the parameters of horizontal spacing/proportional spacing, left offset, and top offset.
- (3) When top offset = 000, the reference coordinates are at the above left in drawing because the base line is at the top. (Coordinate setting is facilitated for logo.)
- (4) Even if any character set or character code is selected, no memory will be wasted.
- (5) When using a new flash memory card, the Format Command ([ESC] J1) must be transmitted. The remaining memory capacity after formatting is the writable character area (715K bytes). However, when the 4-Mbyte flash memory card is used, the remaining memory is 3147 Kbytes.
- (6) The already stored character code can be stored again if the Writable Character Command ([ESC] XD) is transmitted but memory will be consumed every storing again. Memory can be efficiently used by sending the Format Command ([ESC] J1) before storing.
- (7) When performing the label issue operation after sending the Bit Map Writable Character Command ([ESC] XD), the image buffer is cleared automatically.
- (8) When the storing operation is not continued after storing the writable character and logos, the printer automatically enters the online mode (label issue operation) after about 10 seconds. In this case, the image buffer will be cleared automatically.

Refer to

Format Command ([ESC] J1)

Examples

Writable character set: 03
 Writable character code: 70H



```

10 PRINT #1, ESC$; "J1; C"; LF$; NUL$;
20 PRINT #1, ESC$; "XD; 03, p, 002, 022, 026, 031, 030, 0,";
30 PRINT #1, "000? <000";
40 PRINT #1, "? <?? ? 800";
50 PRINT #1, "? <??? ? <00";
60 PRINT #1, "? =? 03>00";
70 PRINT #1, "1? <00? 00";
80 PRINT #1, "1? 800700";
90 PRINT #1, "1? 000780";
100 PRINT #1, "1>000380";
110 PRINT #1, "1>0003<0";
120 PRINT #1, "1<0001<0";
130 PRINT #1, "1<0001<0";
140 PRINT #1, "1<0001<0";
150 PRINT #1, "1<0001<0";
160 PRINT #1, "1<0001<0";
170 PRINT #1, "1>0001<0";
180 PRINT #1, "1>0003<0";
190 PRINT #1, "1>000380";
200 PRINT #1, "1? 000780";
210 PRINT #1, "1? 800? 00";
220 PRINT #1, "1? <01? 00";
230 PRINT #1, "1=? 07>00";
240 PRINT #1, "1<? ? ? <00";
250 PRINT #1, "1<?? ? 800";
260 PRINT #1, "1<0? <000";
270 PRINT #1, "1<000000";
280 PRINT #1, "1<000000";
290 PRINT #1, "1<000000";
300 PRINT #1, "1<000000";
310 PRINT #1, "?? ? <0000";
320 PRINT #1, "?? ? <0000";
330 PRINT #1, "?? ? <0000";
340 PRINT #1, LF$; NUL$;
* 30H = "0"
31H = "1"
32H = "2"
33H = "3"
34H = "4"
35H = "5"
36H = "6"
37H = "7"
38H = "8"
39H = "9"
3AH = ":"
3BH = ","
3CH = "<"
3DH = "="
3EH = ">"
3FH = "? "
    
```

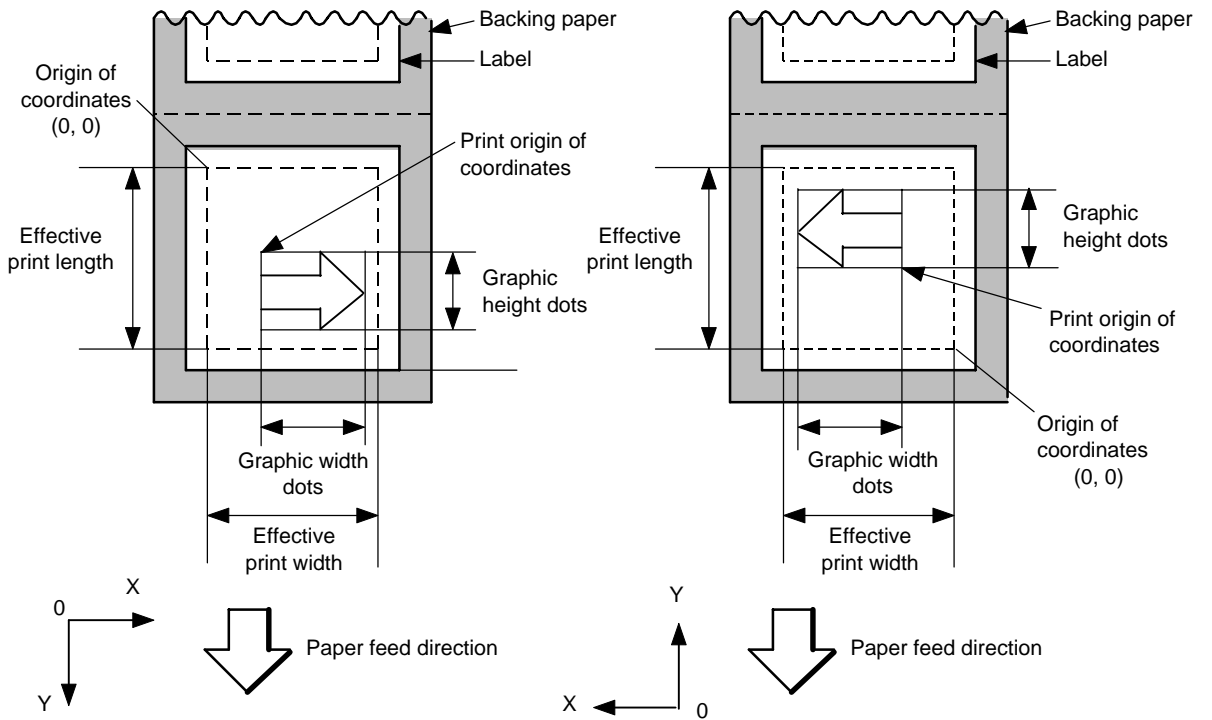

6.22 GRAPHIC COMMAND

[ESC] SG

Function	Draws graphic data.															
Format	[ESC] SG; aaaa, bbbb, cccc, dddd, e, fff --- fff [LF] [NUL]															
Term	<p>aaaa: Print origin of X-coordinate for drawing graphic data Fixed as 4 digits (in 0.1 mm units)</p> <p>bbbb: Print origin of Y-coordinate for drawing graphic data Fixed as 4 digits (in 0.1 mm units)</p> <p>cccc: No. of graphic width dots Fixed as 4 digits (in dots)</p> <p>However, when the graphic data "2: BMP file" is selected, this designation is ignored. (The information of the graphic width is contained in the graphic data.)</p> <p>dddd: No. of graphic height dots Fixed as 4 digits (in dots)</p> <p>However, when the graphic data "2: BMP file" is selected, this designation is ignored. (The information of the graphic width is contained in the graphic data.)</p> <ul style="list-style-type: none">• TOPIX compression mode <p>Resolution of graphic data: *only two types</p> <table><tr><td rowspan="2">}</td><td>0150: 150 dpi (The data is drawn in double resolution.)</td></tr><tr><td>0300: 300 dpi (The data is drawn in single resolution.)</td></tr></table> <p>e: Type of graphic data</p> <table><tr><td>0: Nibble mode (4 dots/byte)</td><td>Overwrite drawing</td></tr><tr><td>1: Hex. mode (8 dots/byte)</td><td>Overwrite drawing</td></tr><tr><td>2: BMP file mode</td><td></td></tr><tr><td>3: TOPIX compression mode</td><td></td></tr><tr><td>4: Nibble mode (4 dots/byte)</td><td>OR drawing</td></tr><tr><td>5: Hex. mode (8 dots/byte)</td><td>OR drawing</td></tr></table> <p>fff --- fff: Graphic data</p>	}	0150: 150 dpi (The data is drawn in double resolution.)	0300: 300 dpi (The data is drawn in single resolution.)	0: Nibble mode (4 dots/byte)	Overwrite drawing	1: Hex. mode (8 dots/byte)	Overwrite drawing	2: BMP file mode		3: TOPIX compression mode		4: Nibble mode (4 dots/byte)	OR drawing	5: Hex. mode (8 dots/byte)	OR drawing
}	0150: 150 dpi (The data is drawn in double resolution.)															
	0300: 300 dpi (The data is drawn in single resolution.)															
0: Nibble mode (4 dots/byte)	Overwrite drawing															
1: Hex. mode (8 dots/byte)	Overwrite drawing															
2: BMP file mode																
3: TOPIX compression mode																
4: Nibble mode (4 dots/byte)	OR drawing															
5: Hex. mode (8 dots/byte)	OR drawing															

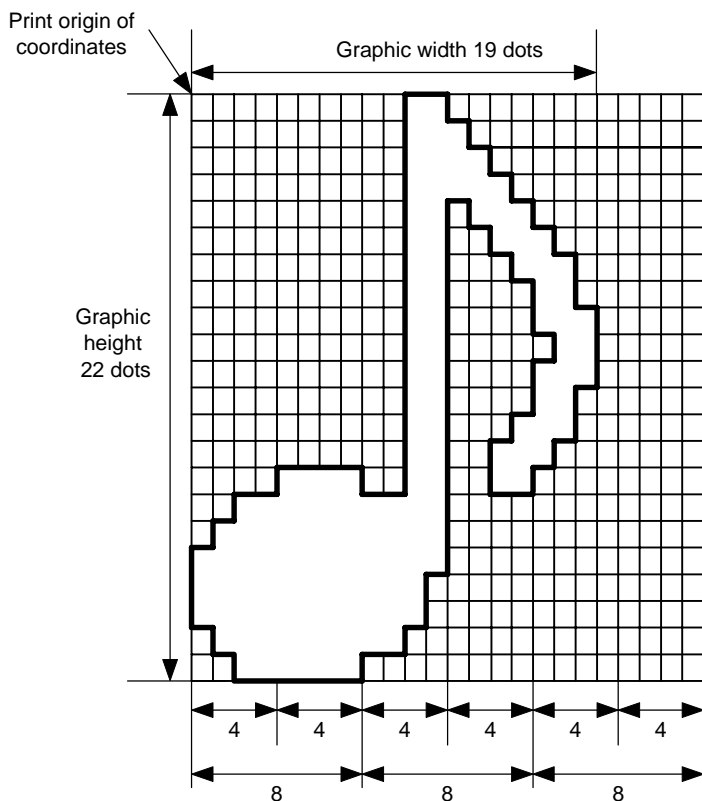
Explanation

- (1) When the graphic data "0" or "1" 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.



[Print direction: Printing bottom first]

[Print direction: Printing top first]



Nibble mode					
1	30H	2	30H	3	33H
4	30H	5	30H	6	30H
7	30H	8	30H	.	
				.	
				.	
				.	
				.	
				.	
				.	
				.	
				.	
				126 30H	
127	33H	128	3FH	129	30H
130	30H	131	30H	132	30H

Hex. mode					
1	00H	2	30H	3	00H
4	00H	5	38H		
				.	
				.	
				.	
				.	
				.	
				63 00H	
64	3FH	65	00H	66	00H

[Nibble mode]

- (1) The graphic data is separated into four dot units and sent in the following order (1 → 132). (high order digit: "3")
- (2) The graphic data is 30H to 3FH.
- (3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.
- (4) The graphic data count must be as follows:

$$\text{Graphic data count} = \{(\text{No. of graphic width dots} + 7) / 8 \} \times \text{No. of graphic height dots} \times 2$$

* The value in the brackets is rounded down to the nearest whole number.

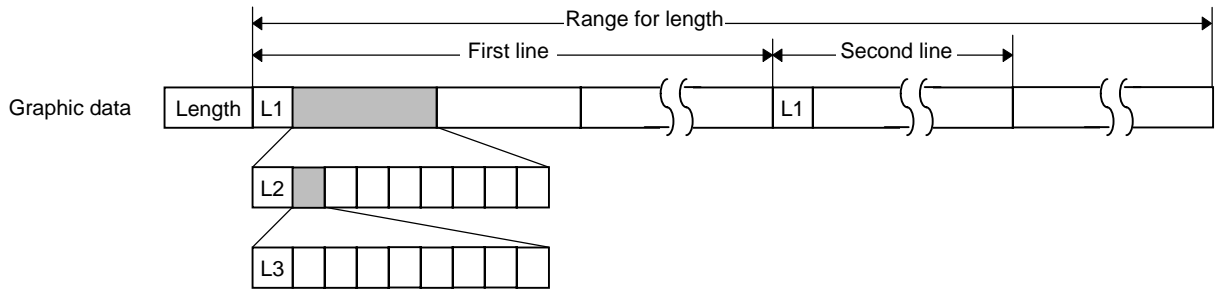
[Hex. mode]

- (1) The graphic data is separated into eight dot units and sent in the following order (1 → 66).
- (2) The data of graphic data is 00H to FFH.
- (3) The minimum unit in the X direction is 8 dots. Dots with no data are transmitted as data 0.
- (4) The graphic data count must be as follows:

$$\text{Graphic data count} = \{(\text{No. of graphic width dots} + 7) / 8 \} \times \text{No. of graphic height dots}$$

* The value in the brackets is rounded down to the nearest whole number.

[When TOPIX compression mode is selected:]

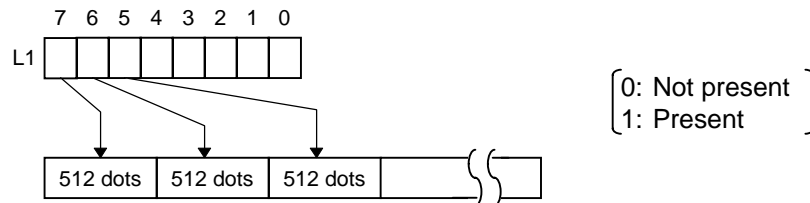


(1) Length: Total number of bytes of the graphic data (0001H ~)

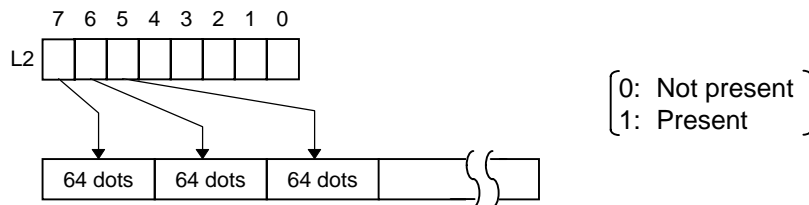
Ex. Length = 20 bytes:

00	14
----	----

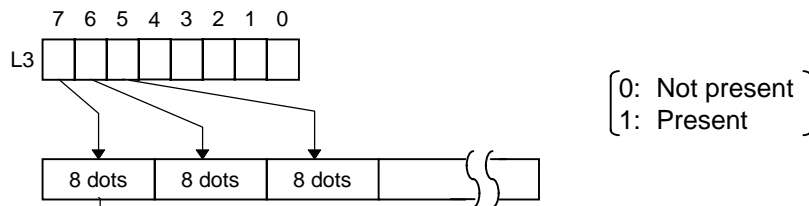
(2) L1 parameter: Shows in which large block (512 dots/block) the changed data is contained.



(3) L2 parameter: Shows in which medium block (64 dots/block) the changed data is contained (of the L1 large block).



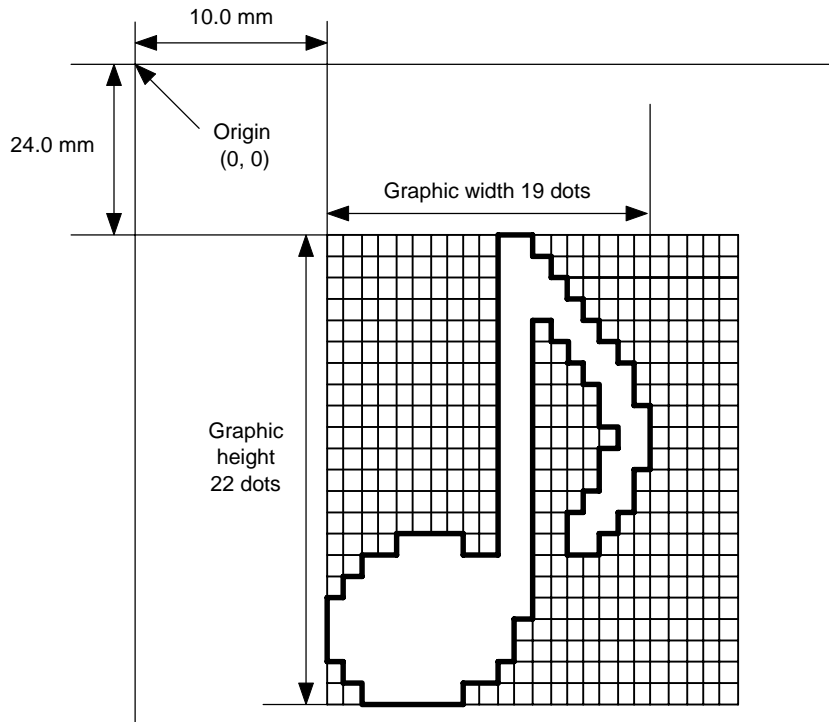
(4) L3 parameter: Shows in which small block (8 dots/block) the changed data is contained (of the L2 medium block).



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 MSD (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 will be reset to 8 dots (1 byte).

Examples



[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 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)

Notes

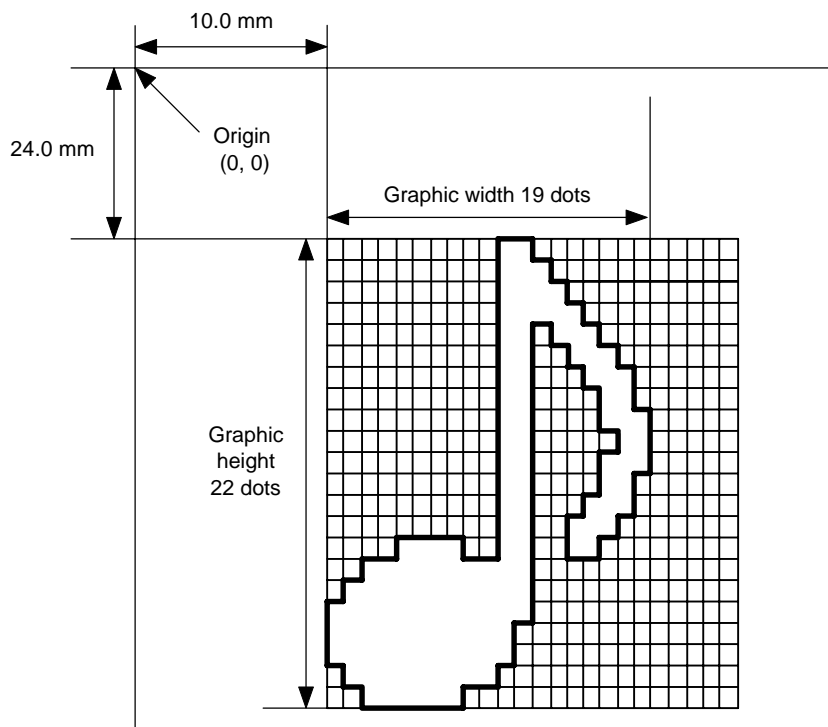
- (1) The print origin of coordinates must be set so that result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D).
- (2) The number of graphic width dots and number of graphic height dots must also be set so that the result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D) in the same manner as above.
- (3) Both width and height are 8 dots/mm.
- (4) The actual result of drawing may deviate within ± 0.5 mm in the X direction with respect to the designated print origin of X-coordinate.

To draw the received graphic data at high speed, the data is directly developed into 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.

- (5) The graphic data overwrites the image buffer.

[Effective print area]				[mm]				
Item	Model			B-472				
	Method			Batch	Strip	Cut		
Effective print width	Min.			10.0				
	Max.			104.0				
Effective print length	Label	Min.			6.0	21.4	23.0	
		Max.	W/o expansion memory			384.0		
			W/expansion memory			896.0		
	Tag	Min.			8.0	23.4		
		Max.	W/o expansion memory			384.0		
			W/expansion memory			896.0		

Examples



```

10 PRINT #1, ESC$; "C"; LF$; NUL$;
20 PRINT #1, ESC$; "SG; 0100, 0240, 0019, 0022, 1";
30 PRINT #1, CHR$ (&H00); CHR$ (&H30); CHR$ (&H00);
40 PRINT #1, CHR$ (&H00); CHR$ (&H38); CHR$ (&H00);
50 PRINT #1, CHR$ (&H00); CHR$ (&H3C); CHR$ (&H00);
60 PRINT #1, CHR$ (&H00); CHR$ (&H3E); CHR$ (&H00);
70 PRINT #1, CHR$ (&H00); CHR$ (&H37); CHR$ (&H00);
80 PRINT #1, CHR$ (&H00); CHR$ (&H33); CHR$ (&H80);
90 PRINT #1, CHR$ (&H00); CHR$ (&H31); CHR$ (&HC0);
100 PRINT #1, CHR$ (&H00); CHR$ (&H30); CHR$ (&HC0);
110 PRINT #1, CHR$ (&H00); CHR$ (&H30); CHR$ (&HE0);
120 PRINT #1, CHR$ (&H00); CHR$ (&H30); CHR$ (&H60);
130 PRINT #1, CHR$ (&H00); CHR$ (&H30); CHR$ (&HE0);
140 PRINT #1, CHR$ (&H00); CHR$ (&H30); CHR$ (&HC0);
150 PRINT #1, CHR$ (&H00); CHR$ (&H31); CHR$ (&HC0);
160 PRINT #1, CHR$ (&H00); CHR$ (&H33); CHR$ (&H80);
170 PRINT #1, CHR$ (&H0F); CHR$ (&H33); CHR$ (&H00);
180 PRINT #1, CHR$ (&H3F); CHR$ (&HF0); CHR$ (&H00);
190 PRINT #1, CHR$ (&H7F); CHR$ (&HF0); CHR$ (&H00);
200 PRINT #1, CHR$ (&HFF); CHR$ (&HF0); CHR$ (&H00);
210 PRINT #1, CHR$ (&HFF); CHR$ (&HE0); CHR$ (&H00);
220 PRINT #1, CHR$ (&HFF); CHR$ (&HE0); CHR$ (&H00);
230 PRINT #1, CHR$ (&H7F); CHR$ (&HC0); CHR$ (&H00);
240 PRINT #1, CHR$ (&H3F); CHR$ (&H00); CHR$ (&H00);
250 PRINT #1, LF$; NUL$;
260 PRINT #1, ESC$; "XS; I, 0001, 0002C6000"; LF$; NUL$;

```

6.23 SAVE START COMMAND

[ESC] XO

Function	Declares the start of saving PC interface commands. (Places the printer in the mode where PC interface commands are written on the flash memory card.)
Format	[ESC] XO; aa, b [LF] [NUL]
Term	aa: Identification number (save No.) used for saving or calling 01 to 99 b: Status response at save time 0: No status response 1: Status response
Notes	(1) Up to 99 kinds of PC interface commands can be stored. The maximum number of PC interface commands varies according to the PC interface command capacity to be stored because of the limited memory capacity. The storable command capacity per saving operation is maximum 65533 bytes. (2) When using a new flash memory card, the Format Command ([ESC] J1) must be transmitted. The remaining memory after formatting is the PC save area (255 Kbytes). However, when the 4-Mbyte flash memory card is used, the remaining memory is 895 Kbytes. (3) The already stored save number can be stored again when the Save Start Command ([ESC] XO) is sent after declaring the termination of saving. However, the memory is consumed every storing again. The memory can be used efficiently by sending the Format Command ([ESC] J1) before storing. (4) After sending the Save Start Command ([ESC] XO), any command other than the following will be saved into the flash memory without being analyzed. <ul style="list-style-type: none">• Save Start Command ([ESC] XO)• Save Terminate Command ([ESC] XP)• Saved Data Call Command ([ESC] XQ)• Bit Map Writable Character Store Command ([ESC] XD)• Reset Command ([ESC] WR)• Status Request Command ([ESC] WS)• Format Command ([ESC] J1) (5) No error check is made for the commands at save time.
Refer to	<ul style="list-style-type: none">• Save Terminate Command ([ESC] XP)• Format Command ([ESC] J1)
Examples	10 PRINT #1, ESC\$; "J1; B"; LF\$; NUL\$; 20 PRINT #1, ESC\$; "XO; 01, 0"; LF\$; NUL\$; 30 PRINT #1, ESC\$; "D0508, 0760, 0468"; LF\$; NUL\$; 40 PRINT #1, ESC\$; "T20C61"; LF\$; NUL\$; 50 PRINT #1, ESC\$; "C"; LF\$; NUL\$; 60 PRINT #1, ESC\$; "PC001; 0200, 0125, 1, 1, A, 00, B"; LF\$; NUL\$; 70 PRINT #1, ESC\$; "PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001"; LF\$; NUL\$; 80 PRINT #1, ESC\$; "XP"; LF\$; NUL\$;

6.24 SAVE TERMINATE COMMAND

[ESC] XP

Function	Declares the termination of saving PC interface commands.
Format	[ESC] XP [LF] [NUL]
Note	If the storing operation is not continued after storing the PC interface command, the printer enters the online mode (label issue operation) after about 10 seconds. In this case, the image buffer will be cleared automatically.
Refer to	Save Start Command ([ESC] XO)

6.25 SAVED DATA CALL COMMAND

[ESC] XQ

Function	Calls saved PC interface commands.
Format	[ESC] XQ; aa, b, c [LF] [NUL]
Term	aa: Save number of the file to be called 01 to 99 b: Status response when calling the data 0: No status response 1: Status response c: Auto call at power on time L: Auto call M: No auto call
Notes	(1) If the relevant save number is not found, an error will result. (2) However, if no save number subject to auto call is found with the option for auto call at power on time selected, the option for no auto call will be selected causing no error. (3) If a command error is found in the PC interface command in auto call at power on time by the Saved Data Call Command, a command error will result. After an error has occurred, the power must be turned off. The option for no auto call is selected when the power is turned on again. (4) The printer enters the online mode (label issue operation) when the Save Data Call Command is sent after the Save Terminate command.
Refer to	<ul style="list-style-type: none">• Save Start Command ([ESC] XO)• Save Terminate Command ([ESC] XP)
Examples	10 PRINT #1, ESC\$; "XQ; 01, 0, L"; LF\$; NUL\$; 20 PRINT #1, ESC\$; "RC001; Sample"; LF\$; NUL\$; 30 PRINT #1, ESC\$; "RC002; 100"; LF\$; NUL\$; 40 PRINT #1, ESC\$; "XS; I, 0002, 0002C6000"; LF\$; NUL\$;

6.26 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 When the printer receives the Message Display Command, it displays the message on the LCD then enters a pause state after processing the received data (after completing the label issue, if the Issue Command has been sent).

The pause state is cleared by the [RESTART] key and the LCD displays the original message. After the pause state is cleared, the printer resumes processing the received data following the Message Display Command.

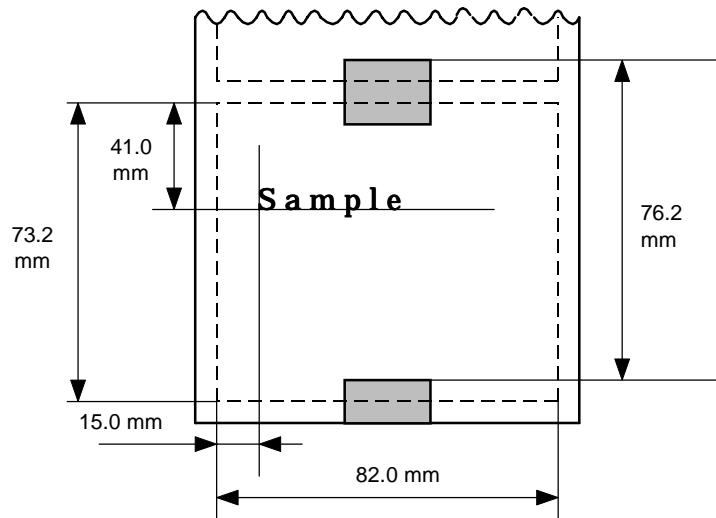
- Notes**
- (1) 16 characters are displayed. When the display data is less than 16 characters, the blank data is processed as spaces. When the display data exceeds 16 characters, the exceeding data is discarded.
 - (2) During a pause, a halt due to an error or a head open state, the Message Display Command is not processed even if the command is received. In this case, the command is processed after the above state are cleared.
 - (3) The following data can be displayed.
If a code other than the following data is received, “?” is displayed or a command error results.

	2	3	4	5	6	7	A	B	C	D
0	SP	0	@	P	M	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	←				

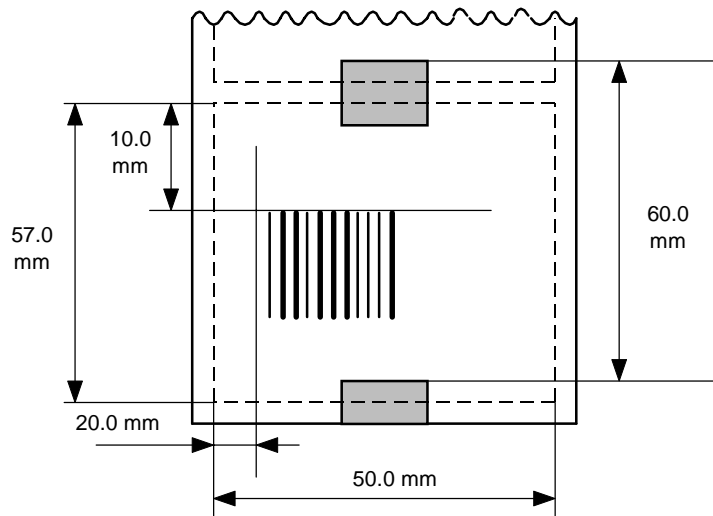
* The shaded parts are Japanese. They are omitted here.

Examples

- ① Load paper.
- ② Feed one sheet.
- ③ Issue 4 labels.



- ④ Message "Please set [Bar-tag]" is displayed.
- ⑤ Change paper.
- ⑥ Press the [RESTART] key.
- ⑦ Feed one label.
- ⑧ Issue 2 labels.



```

10 PRINT #1, ESC$; "D0762, 0820, 0732"; LF$; NUL$;
20 PRINT #1, ESC$; "T11C62"; LF$; NUL$;
30 PRINT #1, ESC$; "C"; LF$; NUL$;
40 PRINT #1, ESC$; "PC001; 0150, 0410, 1, 1, A, 00, B"; LF$; NUL$;
50 PRINT #1, ESC$; "RC001; Sample"; LF$; NUL$;
60 PRINT #1, ESC$; "XS; I, 0004, 0011C6201"; LF$; NUL$;
70 PRINT #1, ESC$; "XJ; Please set [Bar-tag]"; LF$; NUL$;
80 PRINT #1, ESC$; "D0600, 0500, 0570"; LF$; NUL$;
90 PRINT #1, ESC$; "T11C62"; LF$; NUL$;
100 PRINT #1, ESC$; "C"; LF$; NUL$;
110 PRINT #1, ESC$; "XB01; 0200, 0100, 3, 1, 02, 02, 06, 06, 02, 0, 0150"; LF$; NUL$;
120 PRINT #1, ESC$; "RB01; 12345"; LF$; NUL$;
130 PRINT #1, ESC$; "XS; I, 0002, 0011C6201"; LF$; NUL$;

```

6.27 RESET COMMAND

[ESC] WR

Function	Returns the printer to its initial state.
Format	[ESC] WR [LF] [NUL]
Explanation	Returns the printer to the same state as when the power was turned on. When the printer receives this command during printing, it returns to its initial state after issuing the label being printed. The next data must not be sent for a minimum of 3 seconds after this command is transmitted.
Notes	<ol style="list-style-type: none">(1) The Reset Command is effective in serial interface (RS-232C) only. In parallel interface (Centronics), the reset request signal (<u>INPUT</u> • PRIME) should be used.(2) When the printer receives a command in system mode, only the Reset Command can be used and any other command cannot be used.(3) If a command error or communication error occurs when receiving the Reset Command, the error message is displayed in the online mode. However, it is not displayed in system mode.(4) After the code of the Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the type of data.
Example	10 PRINT #1, ESC\$; "WR"; LF\$; NUL\$;

6.28 STATUS REQUEST COMMAND

[ESC] WS

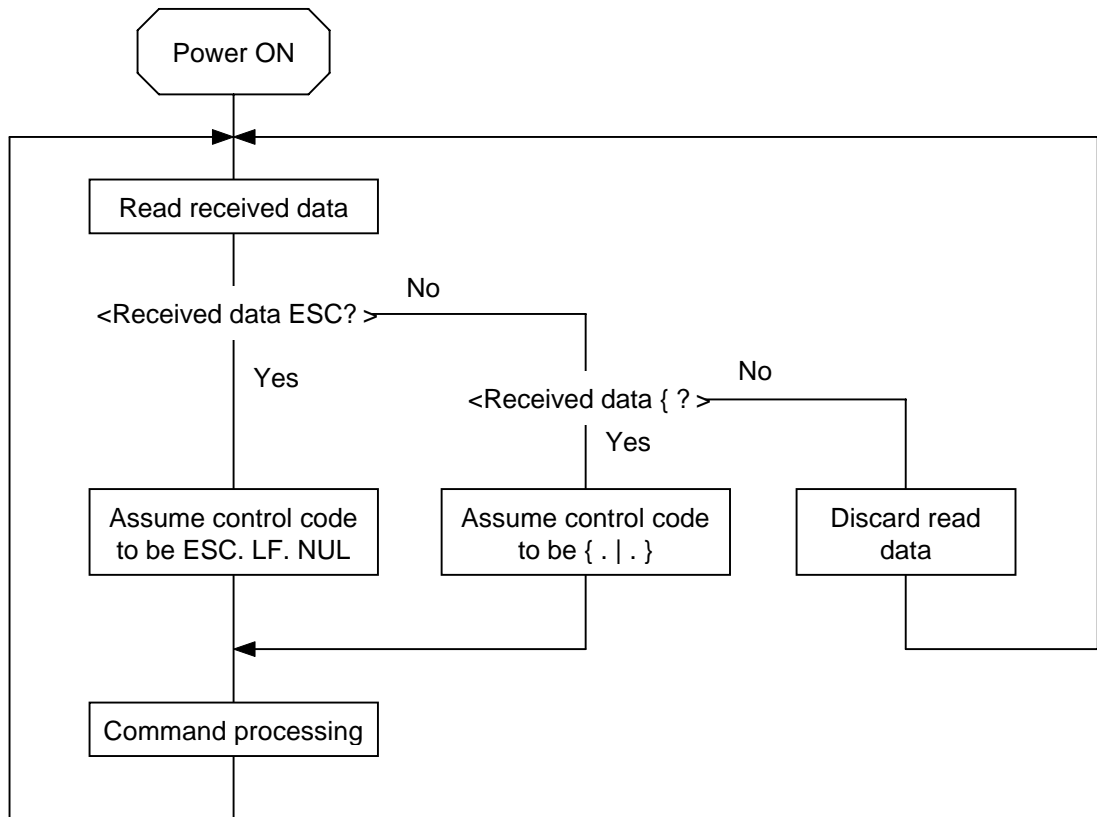
Function	Sends the printer status to the host computer.
Format	[ESC] WS [LF] [NUL]
Explanation	This command makes the printer send its status regardless of the setting of "status response/no status response." The status to be transmitted is the current printer status, and indicates the latest status 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.
Notes	<ol style="list-style-type: none">(1) The Status Request Command is effective in serial interface (RS-232C) only. Since the status cannot be sent in parallel interface (Centronics), this command is not supported.(2) After the code of the Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the type of data.
Example	10 PRINT #1, ESC\$; "WS"; LF\$; NUL\$;

7. CONTROL CODE SELECTION

(1) Automatic Selection

This machine automatically selects [ESC] (1BH). [LF] (0AH). [NUL] (00H) or {(7BH). | (7CH).} (7DH) as an interface command control code. After the power is turned on, the program checks the data from the host for [ESC] and { and assumes the data whichever has been sent first to be a control code.

For example, if [ESC] is sent first after the power is turned on, [ESC]. [LF]. [NUL] becomes a control code, and if { is sent first, { . | . } becomes a control code. Control code selection is made for every command. If the first command is [ESC] ~ [LF] [NUL], followed by [ESC], the control code becomes [ESC]. [LF]. [NUL], and if it is followed by { , the control code for the next command becomes { . | . }. When { . | . } is a control code, the data of 00H to 1FH in { ~ | } is ignored. However, the data of 00H to 1FH becomes valid while processing the Graphic Command or Writable Character Command in hexadecimal mode. When { . | . } is a control code, { . | . } cannot be used in the data of the Data Command or Display Command.



(2) Manual Selection (ESC. LF. NUL)

The control code of the command is [ESC] (1BH). [LF] (0AH). [NUL] (00H), and the control code selection is not performed.

(3) Manual Selection ({ . | . })

The control code of the command is {(7BH). | (7CH).} (7DH), and the control code selection is not performed. Data of 00H to 1FH is ignored and discarded in this mode. However, data of 00H to 1FH becomes valid while processing the Graphic Command or Writable Character Command in hexadecimal mode. { . | . } cannot be used in the data of the Data Command or Display Command.

(4) Control code (Manual method)

In this method, the control code is set by the parameter setting in the system mode.

The code used in each command should not be set as a control code.

In the Data Command or Display Command, the code designated by the control code cannot be used.

8. ERROR PROCESSING

If the printer detects any of the following errors, it will display the error message (LCD, LED), makes status response (serial interface, parallel interface), and stops its operation.

8.1 COMMUNICATION ERRORS

(1) Command Errors

An error results if a command length error, command transmission sequence error, command format error or parameter designation error is found in analyzing the command. An error results if the Format Command of a field is not transmitted and its Data Command is transmitted. When calling the PC Save Command of the field which is not saved is attempted, an error results. An undefined command is not detected as an error, and data is discarded until [NUL] or [}] is received.

(2) Hard Errors

An error results if a framing error, overrun error or parity error is found during data reception when using the serial interface (RS-232C).

* At the moment when a command error or hard error occurs, the printer shows the error message and makes status response before stopping. The Status Request Command and Reset Command only can be processed and other commands are not processed. When the printer is restored by the [RESTART] key, the printer enters the initial state which is obtained after the power is turned on.

8.2 ERRORS IN ISSUING OR FEEDING

(1) Feed Jam

① When the relation between the programmed label (or tag) pitch (A) and the label (or tag) pitch detected by the sensor (B) is not indicated by the following formula, an error will result: $(A) \times 50\% \leq (B) \leq (A) \times 150\%$

- A paper jam has occurred during paper feed.
- The paper is not placed properly.
- The actual label does not match the type of the sensor.
- The sensor position is not aligned with the black mark.
- The actual label size does not meet the designated label length.
- No label-to-label gap is detected due to preprint.
- The sensor is not thoroughly adjusted.

(The sensor is not adjusted for the label to be used.)

② If the stripped label does not cover the strip sensor when printing or feeding is completed in strip mode, an error will result.

(2) Cutter Error

When the cutter home position sensor does not operate 1.5 seconds or more after the cutter motor is driven, an error will result.

- A paper jam has occurred at the cutter. (The cutter does not return to the home position.)
- The cutter does not move from the home position.

(3) Label End

① When the transmissive sensor and reflective sensor detect the label end state in 5 mm continuously, an error will result.

② If the transmissive sensor and reflective sensor detect the label end state when an issue, feed and ejection is attempted when the printer stops, an error will result.

(4) Ribbon End

- ① If the ribbon end sensor detects the ribbon end state in 5 mm continuously when the ribbon is designated, an error will result.
- ② If the ribbon end sensor detects the ribbon end state when the ribbon designation has been selected, and an issue, feed and ejection is attempted when the printer stops, an error will result.

(5) Head Open Error

- ① If the head open sensor detects the open state in 5 mm continuously, an error will result.
- ② If the head open sensor detects the open state when an issue, feed and ejection is attempted in the printer stop state, an error will result.
However, the feeding by the [FEED] key on the printer and the issuing and feeding by the expansion I/O are not included.

(6) Thermal Head Temperature Abnormal

- ① When the open-air temperature detection thermistor detects a high temperature, an error will result.
- ② When the thermal head temperature detection thermistor detects a high temperature, an error will result.

(7) Ribbon Error

- ① When the ribbon rewind motor sensor and ribbon back tension motor sensor does not perform detection if twice the prescribed time has passed, an error will result.
 - An abnormal condition has occurred in the sensor for determining the torque for the ribbon motor.
 - A ribbon jam has occurred.
 - The ribbon has run out.
 - The ribbon is not installed.

(8) Rewinder Overflow

- ① If the rewinder overflow sensor detects the overflow state in 5 mm continuously when the strip function or the built-in rewinder is selected, an error will result.
- ② If the overflow sensor detects an overflow state when an issue, feed or ejection is attempted with the printer being stopped after the strip function or the built-in rewinder is selected, an error will result.

* At the moment an error occurs, the printer shows the error message, makes a status response, and then the printer stops. Only the Status Request Command and Reset Command can be processed. Restoration using the [RESTART] key is possible except in the case of an abnormal thermal head temperature error. (Issue is resumed starting with the label for which the error had occurred.)

8.3 ERRORS IN WRITABLE CHARACTER AND PC COMMAND ENTRY MODES

- (1) Write Error
 - An error has occurred in writing in the flash memory.
- (2) Format Error
 - An erase error has occurred in formatting the flash memory.
- (3) Memory Full
 - Storing is impossible because of the insufficient flash memory capacity.
 - * At the moment when an error occurs, the printer shows the error message and makes status response before stopping. The Status Request Command and Reset Command only can be processed and other commands are not processed. Restoration using the [RESTART] key is impossible.

8.4 SYSTEM ERRORS

- (1) Zero Dividing Error
 - The CPU has detected a zero dividing error. (The program is not running normally.)
- (2) Undefined Command Fetch Error
 - The CPU has fetched an undefined command. (The program is not running normally.)
- (3) Momentary Power Interruption Error
 - A momentary power interruption has occurred.
 - * At the moment when an error occurs, the printer shows the error message and makes status response before stopping. (None of the commands and key operations will be processed.)
- (4) EEPROM Error
 - The EEPROM for back-up cannot be read/written properly.

8.5 RESET PROCESSING

When the [RESTART] key is pressed for more than 3 seconds during the error which can be cleared by the [RESTART] key and during a pause, the printer returns to the initial status which is obtained after the power is turned on.

9. STATUS RESPONSE

9.1 SERIAL INTERFACE

9.1.1 Functions

There are the following two kinds of status response functions.

- (1) Status transmission function at the end of normal transmission and occurrence of an error (auto status transmission)

If the option for “status response” has been selected, the printer sends status to the host computer at the feeding and at the issuing normally (batch/cut mode: after the designated number of labels are printed, strip mode: after printing one label). In the online mode, the head up/down status is sent to the host computer.

When each error occurs, the status is sent to the host computer.

The remaining count of the status response indicates the remaining count of the batch currently being printed. No remaining count of the batch waiting to be printed is transmitted.

- (2) Status transmission function by status request (Status Request Command)

Upon request to send status by the Status Request Command, the printer sends the latest status indicating its current status to the host computer, regardless of the option for “status response/no status response.” 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. This command is not stored in the receive buffer and executed immediately after reception.

[The following applies to the B-472-QP/QQ (V2.4 or after).]

- Strip status

The strip status (05H) returned by the Status Request Command depends on the system mode setting.

When the strip status of the system mode is set to “1”:

If the Status Request Command is sent when a label is on the strip shaft (for example, while idling, after feeding a label, after printing all labels), the printer returns (00H).

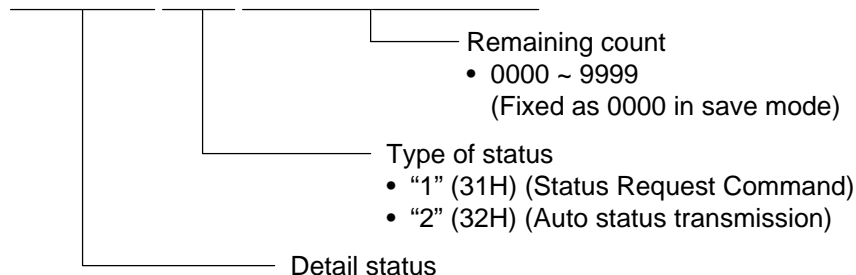
When the strip status of the system mode is set to “2”:

If the Status Request Command is sent when a label is on the strip shaft (for example, while idling, after feeding a label, after printing all labels), the printer returns (05H).

If the Status Request Command is sent while a label is being printed or issued, the strip status (05H) is returned for both settings.

9.1.2 Status Format

SOH	STX	Status			Remaining count				ETX	EOT	CR	LF
01H	02H	3XH	3XH	3XH	3XH	3XH	3XH	3XH	03H	04H	0DH	0AH



9.1.3 Detail Status

LCD Message	Printer Status	Detail Status	
		Auto Status Transmission	Status Request Command
ON LINE	The head was closed with the head open.	00	00
HEAD OPEN	The head was opened in the online mode.	01	01
ON LINE	In operation (Analyzing command, drawing, printing, feeding)	–	02
PAUSE	In pause	–	04
ON LINE	Waiting for stripping	–	05
Display of error message	A command error was found in analyzing the command.	06	06
COMMS ERROR	A parity error, overrun error or framing error occurred during communication by RS-232C	07	07
PAPER JAM	A paper jam occurred during paper feed.	11	11
CUTTER ERROR	An abnormal condition occurred at the cutter.	12	12
NO PAPER	The label has run out.	13	13
NO RIBBON	The ribbon has run out.	14	14
HEAD OPEN	An attempt was made to feed or issue with the head open. (except the [FEED] key and expansion I/O)	15	15
EXCESS HEAD TEMP	The thermal head temperature has become excessively high.	18	18
RIBBON ERROR	An abnormal condition occurred in the sensor for determining the torque for the ribbon motor.	21	21
REWIND FULL	An overflow error has occurred in the rewinder.	22	22
ON LINE	The label issue has terminated normally.	40	–
ON LINE	The feed has terminated normally.	41	–
SAVING ### %%%	In writable character or PC command save mode	–	55
FLASH WRITE ERR.	An error has occurred in writing the flash memory.	50	50
FORMAT ERROR	An erase error has occurred in formatting the flash memory.	51	51
FLASH CARD FULL	Saving failed because of the insufficient capacity of the flash memory.	54	54
Display of error message	A command error has occurred in analyzing the command.	06	06
COMMS ERROR	A parity error, overrun error or framing error has occurred during communication by RS-232C.	07	07
DIVIDE ERROR	A zero dividing error has occurred.	–	–
UNUSED CODE TRAP	An undefined command was fetched.	–	–
POWER FAILURE	A momentary power interruption has occurred.	–	–
EEPROM ERROR	An EEPROM for back up cannot be read/written properly.	–	–

9.2 PARALLEL INTERFACE

LCD Messages	Printer Status	Output Signal			
		BUSY	PAUSE	FAULT	PE
ON LINE	In the online mode	L	H	H	L
ON LINE	In the online mode (communicating)	L, H	H	H	L
HEAD OPEN	The head was opened in the online mode.	H	L	L	L
PAUSE	Paused by the [PAUSE] key	H	L	L	L
ON LINE	Data was set from the host with the receive buffer full.	H	H	H	L
ON LINE	After data was set from the host with the receive buffer full, some data is processed and room becomes available.	L	H	H	L
ON LINE	Initialize process in execution (After the power is turned on or INPUT • PRIME is received)	H	L	L	L
Display of error command	A command error has occurred in analyzing the command.	H	L	L	L
PAPER JAM	A paper jam occurred during paper feed.	H	L	L	L
CUTTER ERROR	An abnormal condition occurred at the cutter.	H	L	L	L
NO PAPER	The label has run out.	H	L	L	H
NO RIBBON	The ribbon has run out.	H	L	L	H
HEAD OPEN	An attempt was made to feed or issue with the head open. (except the [FEED] key and expansion I/O)	H	L	L	L
EXCESS HEAD TEMP	The thermal head temperature has become excessively high.	H	L	L	L
RIBBON ERROR	An abnormal condition occurred in the sensor for determining the torque for the ribbon motor.	H	L	L	L
REWIND FULL	An overflow error has occurred in the rewinder.	H	L	L	L
SAVING ### %%%	In writable character or PC command save mode	L	H	H	L
FLASH WRITE ERR.	An error has occurred in writing in the flash memory.	H	L	L	L
FORMAT ERROR	An erase error has occurred in formatting the flash memory.	H	L	L	L
FLASH CARD FULL	Saving failed because of the insufficient capacity of the flash memory.	H	L	L	L
DIVIDE ERROR	A zero dividing error has occurred.	H	L	L	L
UNUSED CODE TRAP	An undefined command was fetched.	H	L	L	L
POWER FAILURE	A momentary power interruption has occurred.	H	L	L	L
EEPROM ERROR	An EEPROM for back-up cannot be read/written properly.	H	L	L	L

10. LCD MESSAGES AND LED INDICATIONS

No.	LCD Messages	LED Indication			Printer Status	Restoration by [RESTART] key Yes/No	Acceptance of Status Request Reset Command Yes/No
		POWER	ON LINE	ERROR			
1	ON LINE	○	○	●	In the online mode	-	Yes
	ON LINE	○	◐	●	In the online mode (Communicating)	-	Yes
2	HEAD OPEN	○	●	●	The head was opened in the online mode.	-	Yes
3	PAUSE ****	○	●	●	In pause	Yes	Yes
4	COMMUS ERROR	○	●	○	A parity error, overrun error or framing error has occurred during communication by RS-232C.	Yes	Yes
5	PAPER JAM ****	○	●	○	A paper jam occurred during paper feed.	Yes	Yes
6	CUTTER ERROR ****	○	●	○	An abnormal condition occurred at the cutter.	Yes	Yes
7	NO PAPER ****	○	●	○	The label has run out.	Yes	Yes
8	NO RIBBON ****	○	●	○	The ribbon has run out.	Yes	Yes
9	HEAD OPEN ****	○	●	○	An attempt was made to feed or issue with the head open. (except the [FEED] key and expansion I/O.)	Yes	Yes
10	EXCESS HEAD TEMP	○	●	○	The thermal head temperature has become excessively high.	No	Yes
11	RIBBON ERROR ****	○	●	○	An abnormal condition occurred in the sensor for determining the torque for the ribbon motor.	Yes	Yes
12	REWIND FULL ****	○	●	○	An overflow error has occurred in the rewinder.	Yes	Yes
13	SAVING ### %%%	○	○	●	In writable character or PC command save mode	-	Yes
14	FLASH WRITE ERR.	○	●	○	An error has occurred in writing in the flash memory	No	Yes
15	FORMAT ERROR	○	●	○	An erase error has occurred in formatting the flash memory.	No	Yes
16	FLASH CARD FULL	○	●	○	Saving failed because of the insufficient capacity of the flash memory.	No	Yes

11. LCD MESSAGES IN DIFFERENT LANGUAGES

No.	ENGLISH
1	ON LINE
2	HEAD OPEN
3	PAUSE *****
4	COMMS ERROR
5	PAPER JAM *****
6	CUTTER ERROR*****
7	NO PAPER *****
8	NO RIBBON *****
9	HEAD OPEN *****
10	EXCESS HEAD TEMP
11	RIBBON ERROR*****
12	REWIND FULL *****
13	SAVING ### %%%
14	FLASH WRITE ERR.
15	FORMAT ERROR
16	FLASH CARD FULL

No.	GERMAN
1	ON LINE
2	KOPF OFFEN
3	PAUSE *****
4	UEBERTR.-FEHLER
5	PAPIERSTAU *****
6	MESSERFEHL. *****
7	PAPIERENDE *****
8	FARBB.-ENDE *****
9	KOPF OFFEN *****
10	KOPF UEBERHITZT
11	FB-FEHLER *****
12	AUFWI.VOLL *****
13	SP.-MOD ### %%%
14	FLASH FEHLER
15	FORMATFEHLER
16	FLASH ZU KLEIN

No.	FRENCH
1	PRETE
2	TETE OUVERTE
3	PAUSE *****
4	ERR. COMMUNICAT.
5	PB. PAPIER *****
6	PB. CUTTER *****
7	FIN PAPIER *****
8	FIN RUBAN *****
9	TETE OUVERTE*****
10	TETE TROP CHAUDE
11	ERREUR RUBAN*****
12	ERR.REMB. *****
13	MEM LIB ### %%%
14	ERREUR MEM FLASH
15	ERREUR DE FORMAT
16	MEM INSUFFISANTE

No.	DUTCH
1	IN LIJN
2	KOP OPEN
3	PAUZE *****
4	COMM. FOUT
5	PAPIER VAST *****
6	SNIJMES FOUT*****
7	PAPIER OP *****
8	LINT OP *****
9	KOP OPEN *****
10	TEMP.FOUT
11	LINT FOUT *****
12	OPROL VOL *****
13	MEM ### %%%
14	FLASH MEM FOUT
15	FORMAAT FOUT
16	GEHEUGEN VOL

No.	SPANISH
1	ON LINE
2	CABEZAL ABIERTO
3	PAUSA *****
4	ERROR COMUNICACI
5	ATASCO PAPEL*****
6	ERROR CORTAD*****
7	SIN PAPEL *****
8	SIN CINTA *****
9	CABEZA ABIER*****
10	TEMP.CABEZA ALTA
11	ERROR CINTA *****
12	REBOBI.LLENO*****
13	SALVAR ### %%%
14	ERROR ESCRITURA
15	ERROR DE FORMATO
16	MEMORIA INSUFICI

No.	JAPANESE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

* Japanese messages are omitted here.

No.	Italian
1	PRONTA
2	TESTA APERTA
3	PAUSA ****
4	ERR. COMUNICAZ.
5	CARTA INCEP. ****
6	ERR. TAGL. ****
7	NO CARTA ****
8	NO NASTRO ****
9	TESTA APERTA****
10	TEMP. TESTA ALTA
11	ERR. NASTRO ****
12	RIAVV.PIENO ****
13	SALVA ### %%%
14	ERR. SCRITT.CARD
15	ERR.FORMATTAZ.
16	MEM.CARD PIENA

12. CHARACTER CODE TABLE

The followings are the character code tables. However, the characters which can be printed are different according to the character type. For the character which can be printed, refer to the print sample described below.

12.1 TIMES ROMAN, HELVETICA, LETTER GOTHIC, PRESTIGE ELITE, COURIER, OUTLINE FONT

(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	€			ð	Ó	-
1			!	1	A	Q	a	q	Ü	æ	í	=C		Ð	ß	±
2			"	2	B	R	b	r	é	Æ	ó			È	Ô	=
3			#	3	C	S	c	s	â	ô	ú			Ë	Ò	¼
4			\$	4	D	T	d	t	ä	ö	ñ			È	õ	¶
5			%	5	E	U	e	u	à	ò	Ñ	Á		1	Õ	§
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	ì	¢		ÿ	2	
E			.	>	N	^	n	~	Ä	x	«	¥		ÿ		■
F			/	?	O	_	o		Å	f	»		α			'

When the Japanese message is selected using DIP SW1, code 5CH indicates "¥".

The outline font when selecting Japanese is described later.

The Euro code (new currency symbol) (B0H) can be changed in the parameter setting in the system mode.

Code B1H can be used for the Euro code only when the outline font is selected.

(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	=C			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	á	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	Ø	½				δ	√
C			,	<	L	\	l	|	î	£	¼				∞	n
D			-	=	M	]	m	}	ì	¥	ì				∅	2
E			.	>	N	^	n	~	Ä	Pt	«				ε	■
F			/	?	O	_	o		Å	∫	»				∩	

When the Japanese message is selected using DIP SW1, code 5CH indicates "¥".

The outline font when selecting Japanese is described later.

The Euro code (new currency symbol) (B0H) can be changed in the parameter setting in the system mode.

Code B1H can be used for the Euro code only when the outline font is selected.

12.2 PRESENTATION

(1) PC-850

	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 the Japanese message is selected using DIP SW1, code 5CH indicates “¥”.
The Euro code (new currency symbol) (B0H) can be changed in the parameter setting in the system mode.

(2) PC-8: The symbol “¥” is indicated by BEh for the PC-850 and by 9Dh for the PC-8. The symbol “-” is indicated by F0h for the PC-850 and this symbol does not exist for the PC-8.

12.3 OCR-A

(1) PC-850

	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 the Japanese message is selected using DIP SW1, code 5CH indicates “¥”.

(2) PC-8: The symbol “¥” is indicated by BEh for the PC-850 and by 9Dh for the PC-8. The symbol “-” is indicated by F0h for the PC-850 and this symbol does not exist for the PC-8.

12.4 OCR-B

(1) PC-850

	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											

When the Japanese message is selected using DIP SW1, code 5CH indicates “¥”.

The size of the numerals of codes 80h ~ 89h are reduced to 80%.

(2) PC-8: The symbol “¥” is indicated by BEh for the PC-850 and by 9Dh for the PC-8. The symbol “-” is indicated by F0h for the PC-850 and this symbol does not exist for the PC-8.

12.5 OUTLINE FONT

(1) PC-850: When the Japanese message is selected using DIP SW1

	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	△								

* The shaded parts are Japanese.
They are omitted here.

(2) PC-8: Same as the PC-850

13. BAR CODE TABLE

(1) WPC (JAN, EAN, UPC)
ITF, MSI, UCC/EAN128, Industrial 2 of 5

	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						

(2) 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			

(3) 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	△

[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



(4) 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	/					

(5) 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	△

[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	\$	4	D	T	+D	+T
5	%	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



(6) CODE128

[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	△



[Drawing code]

Value Code Table

① How to transmit control code data:

NUL (00H) → >@ (3EH, 40H)
 SOH (01H) → >A (3EH, 41H)
 STX (02H) → >B (3EH, 42H)
 to
 GS (1DH) → >] (3EH, 5DH)
 RS (1EH) → >^ (3EH, 5EH)
 US (1FH) → >_ (3EH, 5FH)

② How to transmit special codes:

Value
 30 (Character >) → >0
 95 → >1
 96 → >2
 97 → >3
 98 → >4
 99 → >5
 100 → >6
 101 → >7
 102 → >8

③ Designation of start code:

START (CODE A) → >7
 START (CODE B) → >6
 START (CODE C) → >5

Value Code Table

VALUE	CODE A	CODE B	CODE C	VALUE	CODE A	CODE B	CODE C	VALUE	CODE A	CODE B	CODE C
0	SP	SP	00	36	D	D	36	72	BS	h	72
1	!	!	01	37	E	E	37	73	HT	i	73
2	"	"	02	38	F	F	38	74	LF	j	74
3	#	#	03	39	G	G	39	75	VT	k	75
4	\$	\$	04	40	H	H	40	76	FF	l	76
5	%	%	05	41	I	I	41	77	CR	m	77
6	&	&	06	42	J	J	42	78	SO	n	78
7	'	'	07	43	K	K	43	79	SI	o	79
8	(	(	08	44	L	L	44	80	DLE	p	80
9	)	)	09	45	M	M	45	81	DC1	q	81
10	*	*	10	46	N	N	46	82	DC2	r	82
11	+	+	11	47	O	O	47	83	DC3	s	83
12	,	,	12	48	P	P	48	84	DC4	t	84
13	-	-	13	49	Q	Q	49	85	NAK	u	85
14	.	.	14	50	R	R	50	86	SYN	v	86
15	/	/	15	51	S	S	51	87	ETB	w	87
16	0	0	16	52	T	T	52	88	CAN	x	88
17	1	1	17	53	U	U	53	89	EM	y	89
18	2	2	18	54	V	V	54	90	SUB	z	90
19	3	3	19	55	W	W	55	91	ESC	{	91
20	4	4	20	56	X	X	56	92	FS	|	92
21	5	5	21	57	Y	Y	57	93	GS	}	93
22	6	6	22	58	Z	Z	58	94	RS	~	94
23	7	7	23	59	[	[	59	95	US	DEL	95
24	8	8	24	60	\	\	60	96	FNC3	FNC3	96
25	9	9	25	61	]	]	61	97	FNC2	FNC2	97
26	:	:	26	62	^	^	62	98	SHIFT	SHIFT	98
27	;	;	27	63	_	_	63	99	CODE C	CODE C	99
28	<	<	28	64	NUL	`	64	100	CODE B	FNC4	CODE B
29	=	=	29	65	SOH	a	65	101	FNC4	CODE A	CODE A
30	>	>	30	66	STX	b	66	102	FNC1	FNC1	FNC1
31	?	?	31	67	ETX	c	67				
32	@	@	32	68	EOT	d	68	103	START CODE A		
33	A	A	33	69	ENQ	e	69	104	START CODE B		
34	B	B	34	70	ACK	f	70	105	START CODE C		
35	C	C	35	71	BEL	g	71				

(7) Data Matrix

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)
11	Numerics	0 to 9 space
12	Letters	A to Z space
13	Alphanumerics, symbols	0 to 9 A to Z space . , - /
14	Alphanumerics	0 to 9 A to Z space
15	ASCII (7-bit)	00H to 7FH
16	ISO (8-bit)	00H to FFH (Kanji)

[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	△								

① How to send control code data

NUL (00H) → >@ (3EH, 40H)
 SOH (01H) → >A (3EH, 41H)
 STX (02H) → >B (3EH, 42H)
 to
 GS (1DH) → >] (3EH, 5DH)
 RS (1EH) → >^ (3EH, 5EH)
 US (1FH) → >_ (3EH, 5FH)

② How to send a special code

> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code

Shift JIS

JIS hexadecimal

(For details, refer to the section for the Bar Code Data Command.)

(8) PDF417

The following modes are automatically selected according to the code used.

Mode	Code	Details
EXC mode	Alphanumerics, symbol	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

[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								

① How to send control code data

NUL (00H) → >@ (3EH, 40H)
 SOH (01H) → >A (3EH, 41H)
 STX (02H) → >B (3EH, 42H)
 to
 GS (1DH) → >] (3EH, 5DH)
 RS (1EH) → >^ (3EH, 5EH)
 US (1FH) → >_ (3EH, 5FH)

② How to send a special code

> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code

Shift JIS

JIS hexadecimal

(For details, refer to the section for the Bar Code Data Command.)

(9) MicroPDF417

The following modes are automatically selected according to the code used.

Mode	Details
Upper case letters, space	A to Z, space
Binary International Character Set	00H to FFH (Kanji)
Numerics	0 to 9

[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	△								

① How to send control code data

NUL (00H) → >@ (3EH, 40H)

SOH (01H) → >A (3EH, 41H)

STX (02H) → >B (3EH, 42H)

to

GS (1DH) → >] (3EH, 5DH)

RS (1EH) → >^ (3EH, 5EH)

US (1FH) → >_ (3EH, 5FH)

② How to send a special code

> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code

Shift JIS

JIS hexadecimal

(For details, refer to the section for the Bar Code Data Command.)

(10) Postal code

Customer bar code

	2	3	4	5	6	
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			

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						

RM4SCC

	2	3	4	5	6	
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			

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	

* (“) or (“) can be designated only as a start/stop code.
 These should not be entered in data.
 If these are entered between data, no bar code is drawn.

(11) 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]		)	125	Ü	220	ü	252	GS	29
34	100010	"	34	~	126	Ý	221	ý	253	RS	30
35	100011	#	35	DEL	127	Þ	222	þ	254	US	31
36	100100	\$	36	;	59	ß	223	ÿ	255	{C159}	159
37	100101	%	37	<	60	à	170	ÿ	161	NBSP	160
38	100110	&	38	=	61	á	172	¸	168	¢	162
39	100111	'	39	>	62	â	177	¸	171	£	163
40	101000	(	40	?	63	ã	178	¸	175	¤	164
41	101001	)	41	[	91	ä	179	¸	176	¥	165
42	101010	"	42	\	92	å	181	¸	180	¦	166
43	101011	+	43	]	93	æ	185	¸	183	§	167
44	101100	,	44	^	94	ç	186	¸	184	©	169
45	101101	-	45	_	95	¸	188	¸	187	SHY	173
46	101110	.	46	Space	32	¸	189	¸	191	®	174
47	101111	/	47	,	44	¸	190	{C138}	138	¶	182
48	110000	0	48	.	46	{C128}	128	{C139}	139	{C149}	149
49	110001	1	49	/	47	{C129}	129	{C140}	140	{C150}	150
50	110010	2	50	:	58	{C130}	130	{C141}	141	{C151}	151
51	110011	3	51	@	64	{C131}	131	{C142}	142	{C152}	152
52	110100	4	52	!	33	{C132}	132	{C143}	143	{C153}	153
53	110101	5	53	|	124	{C133}	133	{C144}	144	{C154}	154
54	110110	6	54	[Pad]		{C134}	134	{C145}	145	{C155}	155
55	110111	7	55	[2 Shift A]		{C135}	135	{C146}	146	{C156}	156
56	111000	8	56	[3 Shift A]		{C136}	136	{C147}	147	{C157}	157
57	111001	9	57	[Pad]		{C137}	137	{C148}	148	{C158}	158
58	111010	:	58	[Shift B]		[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]	

① How to send control code data

SOH (01H)	→	>A (3EH, 41H)
STX (02H)	→	>B (3EH, 42H)
to		
GS (1DH)	→	>] (3EH, 5DH)
RS (1EH)	→	>^ (3EH, 5EH)
US (1FH)	→	>_ (3EH, 5FH)

② How to send a special code

> (3EH)	→	>0 (3EH, 30H)
---------	---	---------------

③ How to send a Kanji code

Shift JIS

JIS hexadecimal

(For details, refer to the section for the Bar Code Data Command.)

NOTE: *NUL data in the table cannot be used, however, it can be designated.
If it is designated, data following "NUL" data is not printed.*

(12) CP code

[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	△								

① How to send control code data

NUL (00H) → >@ (3EH, 40H)

SOH (01H) → >A (3EH, 41H)

STX (02H) → >B (3EH, 42H)

to

GS (1DH) → >] (3EH, 5DH)

RS (1EH) → >^ (3EH, 5EH)

US (1FH) → >_ (3EH, 5FH)

② How to send a special code

> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code

Shift JIS

JIS hexadecimal

(For details, refer to the section for the Bar Code Data Command.)

14. DRAWING OF BAR CODE DATA

- : Field to be incremented/decremented
(The absence of a solid line invalidates incrementing/decrementing.)
- : Field subject to printing numerals under bars.

Type of Bar Code: JAN8, EAN8

(1) No affix

No. of Input Digits										
8 digits	Input Data	<table border="1" style="display: inline-table;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> </tr> </table> └─ To be checked as modulus 10 C/D	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈		
Drawing Data	<table border="1" style="display: inline-table;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈			
Other than 8 digits		Not to be drawn								

(2) Modulus 10 check

No. of Input Digits										
8 digits	Input Data	<table border="1" style="display: inline-table;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> </tr> </table> └─ To be checked as modulus 10 C/D	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈		
Drawing Data	<table border="1" style="display: inline-table;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈			
Other than 8 digits		Not to be drawn								

(3) Auto affix of modulus 10

No. of Input Digits									
7 digits	Input Data	<table border="1" style="display: inline-table;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇		
Drawing Data	<table border="1" style="display: inline-table;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>C/D</td> </tr> </table> └─ Affix a modulus 10 C/D.	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	C/D
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	C/D		
Other than 7 digits		Not to be drawn							

Type of Bar Code: JAN13, EAN13

(1) No affix

No. of Input Digits		
13 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ To be checked as modulus 10 C/D
	Drawing Data	D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃
Other than 13 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
13 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ To be checked as modulus 10 C/D
	Drawing Data	D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃
Other than 13 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
12 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂
	Drawing Data	D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ C/D Affix a modulus 10 C/D.
Other than 12 digits		Not to be drawn

(4) Auto affix of modulus 10 + price C/D 4 digits

No. of Input Digits		
11 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁
	Drawing Data	D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ P/CD D ₈ D ₉ D ₁₀ D ₁₁ C/D Affix price C/D 4 digits. Affix a modulus 10 C/D.
Other than 11 digits		Not to be drawn

(5) Auto affix of modulus 10 + price C/D 5 digits

No. of Input Digits		
11 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁
	Drawing Data	D ₂ D ₃ D ₄ D ₅ D ₆ P/CD D ₇ D ₈ D ₉ D ₁₀ D ₁₁ C/D Affix price C/D 5 digits. Affix a modulus 10 C/D.
Other than 11 digits		Not to be drawn

Type of Bar Code: UPC-A

(1) No affix

No. of Input Digits														
12 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂			
Other than 12 digits		Not to be drawn												

(2) Modulus 10 check

No. of Input Digits														
12 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂			
Other than 12 digits		Not to be drawn												

(3) Auto affix of modulus 10

No. of Input Digits													
11 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>C/D</td> </tr> </table> <p style="text-align: right;">Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	C/D
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	C/D		
Other than 11 digits		Not to be drawn											

(4) Auto affix of modulus 10 + price C/D 4 digits

No. of Input Digits													
10 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀			
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>P/CD</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>C/D</td> </tr> </table> <p style="text-align: right;">Affix price C/D 4 digits.</p> <p style="text-align: right;">Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	P/CD	D ₇	D ₈	D ₉	D ₁₀	C/D
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	P/CD	D ₇	D ₈	D ₉	D ₁₀	C/D		
Other than 10 digits		Not to be drawn											

(5) Auto affix of modulus 10 + price C/D 5 digits

No. of Input Digits													
10 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀			
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>P/CD</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>C/D</td> </tr> </table> <p style="text-align: right;">Affix price C/D 5 digits.</p> <p style="text-align: right;">Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	P/CD	D ₆	D ₇	D ₈	D ₉	D ₁₀	C/D
D ₁	D ₂	D ₃	D ₄	D ₅	P/CD	D ₆	D ₇	D ₈	D ₉	D ₁₀	C/D		
Other than 10 digits		Not to be drawn											

Type of Bar Code: UPC-E

(1) No affix

No. of Input Digits									
7 digits	Input Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td> </tr> </table> To be checked as modulus 10 C/D	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇		
Drawing Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇		
Other than 7 digits		Not to be drawn							

(2) Modulus 10 check

No. of Input Digits									
7 digits	Input Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td> </tr> </table> To be checked as modulus 10 C/D	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇		
Drawing Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇		
Other than 7 digits		Not to be drawn							

(3) 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>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td> </tr> </table> Calculate and reflect modulus 10 in the bar code.	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆			
Drawing Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>C/D</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	C/D
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	C/D		
Other than 6 digits		Not to be drawn							

Type of Bar Code: JAN8 + 2 digits, EAN8 + 2 digits

(1) No affix

No. of Input Digits												
10 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td> </tr> </table> <p style="text-align: right;">└─ To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> <td>D₉</td><td>D₁₀</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀			
Other than 10 digits		Not to be drawn										

(2) Modulus 10 check

No. of Input Digits												
10 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td> </tr> </table> <p style="text-align: right;">└─ To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> <td>D₉</td><td>D₁₀</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀			
Other than 10 digits		Not to be drawn										

(3) Auto affix of modulus 10

No. of Input Digits											
9 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>C/D</td> <td>D₈</td><td>D₉</td> </tr> </table> <p style="text-align: right;">└─ Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	C/D	D ₈	D ₉
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	C/D	D ₈	D ₉		
Other than 9 digits		Not to be drawn									

Type of Bar Code: JAN8 + 5 digits, EAN8 + 5 digits

(1) No affix

No. of Input Digits															
13 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td> </tr> </table> <p style="text-align: right;">└─ To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> <td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃			
Other than 13 digits		Not to be drawn													

(2) Modulus 10 check

No. of Input Digits															
13 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td> </tr> </table> <p style="text-align: right;">└─ To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> <td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃			
Other than 13 digits		Not to be drawn													

(3) Auto affix of modulus 10

No. of Input Digits														
12 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>C/D</td> <td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table> <p style="text-align: right;">└─ Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	C/D	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	C/D	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Other than 12 digits		Not to be drawn												

Type of Bar Code: JAN13 + 2 digits, EAN13 + 2 digits

(1) No affix

No. of Input Digits		
15 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅
	Drawing Data	
Other than 15 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
15 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅
	Drawing Data	
Other than 15 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
14 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄
	Drawing Data	
Other than 14 digits		Not to be drawn

(4) Auto affix of modulus 10 + price C/D 4 digits

No. of Input Digits		
13 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃
	Drawing Data	
Other than 13 digits		Not to be drawn

(5) Auto affix of modulus 10 + price C/D 5 digits

No. of Input Digits		
13 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃
	Drawing Data	
Other than 13 digits		Not to be drawn

Type of Bar Code: JAN13 + 5 digits, EAN13 + 5 digits

(1) No affix

No. of Input Digits		
18 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈
	Drawing Data	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> D₂ D₃ D₄ D₅ D₆ D₇ D₈ D₉ D₁₀ D₁₁ D₁₂ D₁₃ D₁₄ D₁₅ D₁₆ D₁₇ D₁₈ </div>
Other than 18 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
18 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈
	Drawing Data	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> D₂ D₃ D₄ D₅ D₆ D₇ D₈ D₉ D₁₀ D₁₁ D₁₂ D₁₃ D₁₄ D₁₅ D₁₆ D₁₇ D₁₈ </div>
Other than 18 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
17 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇
	Drawing Data	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> D₂ D₃ D₄ D₅ D₆ D₇ D₈ D₉ D₁₀ D₁₁ D₁₂ C/D D₁₃ D₁₄ D₁₅ D₁₆ D₁₇ </div>
Other than 17 digits		Not to be drawn

(4) Auto affix of modulus 10 + price C/D 4 digits

No. of Input Digits		
16 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆
	Drawing Data	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> D₂ D₃ D₄ D₅ D₆ D₇ P/CD D₈ D₉ D₁₀ D₁₁ C/D D₁₂ D₁₃ D₁₄ D₁₅ D₁₆ </div>
Other than 16 digits		Not to be drawn

(5) Auto affix of modulus 10 + price C/D 5 digits

No. of Input Digits		
16 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆
	Drawing Data	<div style="border: 1px solid black; padding: 2px; display: inline-block;"> D₂ D₃ D₄ D₅ D₆ P/CD D₇ D₈ D₉ D₁₀ D₁₁ C/D D₁₂ D₁₃ D₁₄ D₁₅ D₁₆ </div>
Other than 16 digits		Not to be drawn

Type of Bar Code: UPC-A + 2 digits

(1) No affix

No. of Input Digits																
14 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td><td>D₁₄</td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> <td>D₁₃</td><td>D₁₄</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄			
Other than 14 digits		Not to be drawn														

(2) Modulus 10 check

No. of Input Digits																
14 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td><td>D₁₄</td> </tr> </table> <p style="text-align: center;">To be checked as modulus 10 C/D</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> <td>D₁₃</td><td>D₁₄</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄			
Other than 14 digits		Not to be drawn														

(3) Auto affix of modulus 10

No. of Input Digits															
13 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>D₁₃</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>C/D</td> <td>D₁₂</td><td>D₁₃</td> </tr> </table> <p style="text-align: right;">Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	C/D	D ₁₂	D ₁₃
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	C/D	D ₁₂	D ₁₃		
Other than 13 digits		Not to be drawn													

(4) Auto affix of modulus 10 + price C/D 4 digits

No. of Input Digits															
12 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂			
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>P/CD</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>C/D</td> <td>D₁₁</td><td>D₁₂</td> </tr> </table> <p style="text-align: right;">Affix price C/D 4 digits. Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	P/CD	D ₇	D ₈	D ₉	D ₁₀	C/D	D ₁₁	D ₁₂
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	P/CD	D ₇	D ₈	D ₉	D ₁₀	C/D	D ₁₁	D ₁₂		
Other than 12 digits		Not to be drawn													

(5) Auto affix of modulus 10 + price C/D 5 digits

No. of Input Digits															
12 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂			
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>P/CD</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>C/D</td> <td>D₁₁</td><td>D₁₂</td> </tr> </table> <p style="text-align: right;">Affix price C/D 5 digits. Affix a modulus 10 C/D.</p>	D ₁	D ₂	D ₃	D ₄	D ₅	P/CD	D ₆	D ₇	D ₈	D ₉	D ₁₀	C/D	D ₁₁	D ₁₂
D ₁	D ₂	D ₃	D ₄	D ₅	P/CD	D ₆	D ₇	D ₈	D ₉	D ₁₀	C/D	D ₁₁	D ₁₂		
Other than 12 digits		Not to be drawn													

Type of Bar Code: UPC-A + 5 digits

(1) No affix

No. of Input Digits		
17 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ To be checked as modulus 10 C/D
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇
Other than 17 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
17 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ To be checked as modulus 10 C/D
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇
Other than 17 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
16 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ C/D D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ Affix a modulus 10 C/D.
Other than 16 digits		Not to be drawn

(4) Auto affix of modulus 10 + price C/D 4 digits

No. of Input Digits		
15 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ P/CD D ₇ D ₈ D ₉ D ₁₀ C/D D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ Affix price C/D 4 digits. Affix a modulus 10 C/D.
Other than 15 digits		Not to be drawn

(5) Auto affix of modulus 10 + price C/D 5 digits

No. of Input Digits		
15 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ P/CD D ₆ D ₇ D ₈ D ₉ D ₁₀ C/D D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ Affix price C/D 5 digits. Affix a modulus 10 C/D.
Other than 15 digits		Not to be drawn

Type of Bar Code: UPC-E + 2 digits

(1) No affix

No. of Input Digits											
9 digits	Input Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table> To be checked as modulus 10 C/D	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Drawing Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Other than 9 digits		Not to be drawn									

(2) Modulus 10 check

No. of Input Digits											
9 digits	Input Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table> To be checked as modulus 10 C/D	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Drawing Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Other than 9 digits		Not to be drawn									

(3) 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>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td> </tr> </table> Calculate and reflect modulus 10 C/D in the bar code.	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈			
Drawing Data	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>C/D</td><td>D₇</td><td>D₈</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	C/D	D ₇	D ₈
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	C/D	D ₇	D ₈		
Other than 8 digits		Not to be drawn									

Type of Bar Code: UPC-E + 5 digits

(1) No affix

No. of Input Digits														
12 digits	Input Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table> <div style="text-align: right; margin-right: 100px;"> ↳ To be checked as modulus 10 C/D </div>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Other than 12 digits		Not to be drawn												

(2) Modulus 10 check

No. of Input Digits														
12 digits	Input Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table> <div style="text-align: right; margin-right: 100px;"> ↳ To be checked as modulus 10 C/D </div>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂		
Other than 12 digits		Not to be drawn												

(3) 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>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td> </tr> </table> Calculate and reflect modulus 10 C/D in the bar code.	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁			
Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>0</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>C/D</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td> </tr> </table>	0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	C/D	D ₇	D ₈	D ₉	D ₁₀	D ₁₁
0	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	C/D	D ₇	D ₈	D ₉	D ₁₀	D ₁₁		
Other than 11 digits		Not to be drawn												

Type of Bar Code: MSI

(1) No affix

No. of Input Digits		
Max. 15 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ <div style="text-align: right;">└─ Not recognized as a check digit.</div>
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
16 digits or more		Not to be drawn

(2) IBM modulus 10 check

No. of Input Digits		
Min. 2 digits Max. 15 digits (including C/D)	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ <div style="text-align: right;">└─ To be checked IBM modulus 10</div>
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀
1 digit 16 digits or more		Not to be drawn

(3) Auto affix of IBM modulus 10

No. of Input Digits		
Max. 14 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₆ D ₉ C/D <div style="text-align: right;">└─ Affix IBM modulus 10.</div>
15 digits or more		Not to be drawn

(4) IBM modulus 10 + Auto affix of IBM modulus 10

No. of Input Digits		
Max. 13 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₆ D ₉ C/D ₁ C/D ₂ <div style="text-align: right;">└─ Affix IBM modulus 10.</div> <div style="text-align: right;">└─ Affix IBM modulus 10.</div>
14 digits or more		Not to be drawn

(5) IBM modulus 11 + Auto affix of IBM modulus 10

No. of Input Digits		
Max. 13 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₆ D ₉ C/D ₁ C/D ₂ <div style="text-align: right;">└─ Affix IBM modulus 10.</div> <div style="text-align: right;">└─ Affix IBM modulus 11.</div>
14 digits or more		Not to be drawn

Type of Bar Code: Interleaved 2 of 5

(1) No affix

No. of Input Digits		
Max. 126 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ ↙ Not recognized as a check digit.
	Drawing Data	0 D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
127 digits or more		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
Min. 2 digits Max. 126 digits (including C/D)	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ ↙ To be checked as modulus 10 C/D
	Drawing Data	0 D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
1 digit 127 digits or more		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
Max. 125 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₆ D ₉ C/D ↙ Affix a modulus 10 C/D.
126 digits or more		Not to be drawn

(4) Auto affix of DBP modulus 10

No. of Input Digits		
Max. 125 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₆ D ₉ C/D ↙ Affix a DBP modulus 10.
126 digits or more		Not to be drawn

Type of Bar Code: Industrial 2 of 5

(1) No affix

No. of Input Digits											
Max. 126 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉			
127 digits or more		Not to be drawn									

Not recognized as a check digit.

(2) Modulus check character check

No. of Input Digits											
Min. 2 digits Max. 126 digits (including C/D)	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉			
1 digit 127 digits or more		Not to be drawn									

To be checked as a modulus check character

(3) Auto affix of modulus check character

No. of Input Digits											
Max. 125 digits	Input Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉
	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉		
Drawing Data	<table border="1"> <tr> <td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>C/D</td> </tr> </table>	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D
D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D		
126 digits or more		Not to be drawn									

Affix a modulus check character.

Type of Bar Code: CODE39 (Standard)

(1) No affix

No. of Input Digits																																		
Max. 123 digits	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="9">Start code</td> <td>Stop code</td> </tr> <tr> <td colspan="11">Not recognized as a check digit.</td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code									Stop code	Not recognized as a check digit.										
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																							
Start code									Stop code																									
Not recognized as a check digit.																																		
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="11"> </td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																						
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																								
124 digits or more		Not to be drawn																																

(2) Modulus 43 check

No. of Input Digits																																		
Min. 2 digits Max. 123 digits (including C/D)	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="9">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 ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code									Stop code	To be checked as modulus 43 C/D										
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																							
Start code									Stop code																									
To be checked as modulus 43 C/D																																		
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="11"> </td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																						
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																								
1 digit 124 digits or more		Not to be drawn																																

(3) Auto affix of modulus 43

No. of Input Digits																																			
Max. 122 digits	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="9">Start code</td> <td>Stop code</td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code									Stop code												
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																								
Start code									Stop code																										
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</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 ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D	Sp												Affix a modulus 43 C/D.										
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D	Sp																								
Affix a modulus 43 C/D.																																			
123 digits or more		Not to be drawn																																	

Type of Bar Code: CODE39 (Full ASCII)

(1) No affix

No. of Input Digits																																			
Max. 60 digits	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</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 ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code										Stop code	Not recognized as a check digit.										
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																								
Start code										Stop code																									
Not recognized as a check digit.																																			
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="11"> </td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																							
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																									
61 digits or more		Not to be drawn																																	

(2) Modulus 43 check

No. of Input Digits																																			
Min. 2 digits Max. 60 digits (including C/D)	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</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 ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code										Stop code	To be checked as modulus 43 C/D										
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																								
Start code										Stop code																									
To be checked as modulus 43 C/D																																			
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="11"> </td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																							
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																									
1 digit 61 digits or more		Not to be drawn																																	

(3) Auto affix of modulus 43

No. of Input Digits																																			
Max. 60 digits	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code										Stop code											
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp																								
Start code										Stop code																									
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</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 ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D	Sp												Affix a modulus 43 C/D.										
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	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 Bar Code: NW7

- (1) No affix
- C/D check
- Auto affix

No. of Input Digits																								
Max. 125 digits	Input Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="10">Start code</td> <td>Stop code</td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp	Start code										Stop code
	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp													
Start code										Stop code														
Drawing Data	<table border="1"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>Sp</td> </tr> <tr> <td colspan="11"> </td> </tr> </table>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp												
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	Sp														
126 digits or more		Not to be drawn																						

Type of Bar Code: No auto selection of CODE128 (Character ">" to be also counted as a digit)

- (1) No affix
- PSEUDO103 check
- Auto affix of PSEUDO103

No. of Input Digits		
Min. 3 digits Max. 125 digits (including start code)	Input Data	St | D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | D ₆ | D ₇ | D ₈ | D ₉ | D ₁₀ | D ₁₁
	Drawing Data	St | D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | D ₆ | D ₇ | D ₈ | D ₉ | D ₁₀ | D ₁₁ | C/D | Sp <div style="text-align: right; margin-top: -10px;">└ Affix PSEUDO103 C/D.</div>
2 digits or less 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 Bar Code: Auto selection of CODE 128

- (1) No affix
- C/D check
- Auto affix of C/D

No. of Input Digits		
Max. 60 digits	Input Data	D ₁ | D ₂ | D ₃ | D ₄ | D ₅ | D ₆ | D ₇ | D ₈ | D ₉ | D ₁₀ | D ₁₁
	Drawing Data	St | D ₁ | D ₂ | D ₃ | D ₄ | AD | D ₅ | D ₆ | D ₇ | AD | D ₈ | D ₉ | D ₁₀ | D ₁₁ | C/D | Sp <div style="display: flex; justify-content: space-between; margin-top: -10px;"> └ Start code └ Selection code └ Stop code </div> <div style="text-align: right; margin-top: -10px;">└ Affix PSEUDO103 C/D.</div>
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 Bar Code: CODE93

- (1) No affix
- C/D check
- Auto affix of C/D

No. of Input Digits		
Max. 60 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉
	Drawing Data	
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 Bar Code: UCC/EAN128

- (1) No affix
- C/D check
- Auto affix of C/D

No. of Input Digits		
19 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ ... D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈ D ₁₉
	Drawing Data	
Other than 19 digits		Not to be drawn

Type of Bar Code: POSTNET

(1) Auto affix of dedicated C/D

No. of Input Digits																		
5 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅																
	Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>C/D</td><td>Sp</td> </tr> </table> Start code (under St) Stop code (under C/D) Dedicated check digit (under C/D)	St	D ₁	D ₂	D ₃	D ₄	D ₅	C/D	Sp								
St	D ₁	D ₂	D ₃	D ₄	D ₅	C/D	Sp											
9 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉																
	Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>C/D</td><td>Sp</td> </tr> </table> Start code (under St) Stop code (under C/D) Dedicated check digit (under C/D)	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D	Sp				
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	C/D	Sp							
11 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁																
	Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>C/D</td><td>Sp</td><td>Fr</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>C/D</td><td>Fr</td> </tr> </table> Start code (under St) Stop code (under C/D) Frame (under Fr) Dedicated check digit (under C/D) Frame (under Fr)	St	D ₁	D ₂	D ₃	D ₄	D ₅	C/D	Sp	Fr	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	C/D
St	D ₁	D ₂	D ₃	D ₄	D ₅	C/D	Sp	Fr	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	C/D	Fr		
Other than 5, 9, and 11 digits		Not to be drawn																

Type of Bar Code: RM4SCC

(1) Auto affix of dedicated C/D

No. of Input Digits																
12 digits	Input Data	(St) D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ (Sp)														
	Drawing Data	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>St</td><td>D₁</td><td>D₂</td><td>D₃</td><td>D₄</td><td>D₅</td><td>D₆</td><td>D₇</td><td>D₈</td><td>D₉</td><td>D₁₀</td><td>D₁₁</td><td>D₁₂</td><td>C/D</td><td>Sp</td> </tr> </table> Start code (under St) Stop code (under Sp) Dedicated check digit (under C/D)	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	C/D
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	C/D	Sp		
13 digits or more		Not to be drawn														

Type of Bar Code: KIX CODE

(1) No affix

No. of Input Digits		
18 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈
	Drawing Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈
19 digits or more		Not to be drawn

Type of Bar Code: Customer bar code

(1) Auto affix of dedicated C/D

No. of Input Digits																								
20 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈ D ₁₉ D ₂₀																						
	Drawing Data	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 2%;">St</td> <td style="width: 2%;">D₁</td> <td style="width: 2%;">D₂</td> <td style="width: 2%;">D₃</td> <td style="width: 2%;">D₄</td> <td style="width: 2%;">D₅</td> <td style="width: 2%;">D₆</td> <td style="width: 2%;">D₇</td> <td style="width: 2%;">D₈</td> <td style="width: 2%;">D₉</td> <td style="width: 2%;">D₁₀</td> <td style="width: 2%;">D₁₁</td> <td style="width: 2%;">D₁₂</td> <td style="width: 2%;">D₁₃</td> <td style="width: 2%;">D₁₄</td> <td style="width: 2%;">D₁₅</td> <td style="width: 2%;">D₁₆</td> <td style="width: 2%;">D₁₇</td> <td style="width: 2%;">D₁₈</td> <td style="width: 2%;">D₁₉</td> <td style="width: 2%;">D₂₀</td> <td style="width: 2%;">C/D</td> <td style="width: 2%;">Sp</td> </tr> </table> <p style="margin-left: 20px;">Start code</p> <p style="margin-left: 180px;">Dedicated check digit</p> <p style="margin-left: 200px;">Stop code</p>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄	D ₁₅	D ₁₆	D ₁₇	D ₁₈	D ₁₉	D ₂₀	C/D
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄	D ₁₅	D ₁₆	D ₁₇	D ₁₈	D ₁₉	D ₂₀	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 Bar Code: Highest priority customer bar code

(1) Auto affix of dedicated C/D

No. of Input Digits																								
19 digits	Input Data	D ₁ D ₂ D ₃ D ₄ D ₅ D ₆ D ₇ D ₈ D ₉ D ₁₀ D ₁₁ D ₁₂ D ₁₃ D ₁₄ D ₁₅ D ₁₆ D ₁₇ D ₁₈ D ₁₉																						
	Drawing Data	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 2%;">St</td> <td style="width: 2%;">D₁</td> <td style="width: 2%;">D₂</td> <td style="width: 2%;">D₃</td> <td style="width: 2%;">D₄</td> <td style="width: 2%;">D₅</td> <td style="width: 2%;">D₆</td> <td style="width: 2%;">D₇</td> <td style="width: 2%;">D₈</td> <td style="width: 2%;">D₉</td> <td style="width: 2%;">D₁₀</td> <td style="width: 2%;">D₁₁</td> <td style="width: 2%;">D₁₂</td> <td style="width: 2%;">D₁₃</td> <td style="width: 2%;">D₁₄</td> <td style="width: 2%;">D₁₅</td> <td style="width: 2%;">D₁₆</td> <td style="width: 2%;">D₁₇</td> <td style="width: 2%;">D₁₈</td> <td style="width: 2%;">D₁₉</td> <td style="width: 2%;">CC7</td> <td style="width: 2%;">C/D</td> <td style="width: 2%;">Sp</td> </tr> </table> <p style="margin-left: 20px;">Start code</p> <p style="margin-left: 180px;">CC7</p> <p style="margin-left: 180px;">Dedicated check digit</p> <p style="margin-left: 200px;">Stop code</p>	St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄	D ₁₅	D ₁₆	D ₁₇	D ₁₈	D ₁₉	CC7	C/D
St	D ₁	D ₂	D ₃	D ₄	D ₅	D ₆	D ₇	D ₈	D ₉	D ₁₀	D ₁₁	D ₁₂	D ₁₃	D ₁₄	D ₁₅	D ₁₆	D ₁₇	D ₁₈	D ₁₉	CC7	C/D	Sp		
20 digits or more		Data of up to 19 digits is drawn. Data of 20 digits or more is discarded.																						

15. AUTOMATIC ADDING OF START/STOP CODE

Type of Bar Code	Designation of Start/Stop Code	Input Data	Drawing Data	
CODE 39	Omit (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*
		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*	
	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 Bar Code	Designation of Start/Stop Code	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 Bar Code	Designation of Start/Stop Code	Input Data	Drawing Data
NW7	Omit (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	

16. OPERATION-CONFIRMED FLASH MEMORY CARDS

Capacity of card	Manufacturer	Part No.	Device code	Manufacturer code
1 MB	Maxell	EF-1M-TB [AA]	D0H	1CH
	Mitsubishi	MF81M1-GBDAT01		
4 MB	Maxell	EF-4M-TB [CC]	88H	B0H
	Maxell	EF-4M-TB [DC]	ADH	04H
	Centennial Technologies INC.	FL04M-15-11119-03		01H
	INTEL	IMC004FLSA	A2H	89H
	Simple TECHNOLOGY	STI-FL/4A		
	Mitsubishi	MF84M1-G7DAT01		
	PC Card KING MAX	FJN-004M6C		
	PC Card	FJP-004M6R	A0H	89H