TOSHIBA TEC Bar Code Printer

B-850 Series

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 TPCL (TEC Printer Control Language) of the B-850 general-purpose thermal label/tag printers.

2. GENERAL DESCRIPTION

The external equipment interface connects a printer to the host computer through a serial interface (RS-232C), parallel interface (Centronics), or a network for making various settings and printing labels. PCL emulation (Printer Control Language for Hewlett Packard laser printer) is enabled by connecting the optional PCL board to the B-850 series printer. However, this specification describes how to use the external equipment interface for the TPCL (TEC Printer Command Language).

Model			B-852-TS12-QQ/QP
Memory	Flash ROM		2 MB × 2 = 4 MB
	SDRAM	Whole	8 MB × 1 = 8 MB
		Image buffer of whole SDRAM	2.3 MB (640 mm long)
Interface	Standard		RS-232C Centronics
	Option		TCP/IP PCMCIA
Ribbon module			Standard
Cutter module			Option
PCL board			Option
PCMCIA board			Option
Keyboard (KB-80)			Option
Expansion I/O interface board			Option

Available PCMCIA cards

- LAN card

  SCCE589ET series only, manufactured by 3COM

- ATA card

  ATA flash card using flash memory manufactured by SanDisk or HITACHI.

- Flash memory card

Capacity	Operation	Manufacturer	Item Code	Device Code	Manufacturer's Code
1 MB	Read only	Maxell	EF-1M-TB AA	D0H	1CH
		Mitsubishi	MF81M1-GBDAT01	D0H	1CH
4 MB	Read/Write	Maxell	EF-4M-TB CC	88H	B0H
		Maxell	EF-4M-TB DC	ADH	04H
	Read only	Centennial Technologies INC.	FL04M-15-11119-03	ADH	01H
		INTEL	IMC004FLSA	A2H	89H
		Simple TECNOLOGY	STI-FL/4A	A2H	89H
		Mitsubishi	MF84M1-G7DAT01	A2H	89H
		PC Card KING MAX	FJN-004M6C	A2H	89H
		Centennial Technologies INC.	FL04M-20-11138-67	A2H	89H
		PC Card	FJP-004M6R	A0H	89H
		Mitsubishi	MF84M1-GMCAV01	AAH	89H

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	
(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.
(10)	Protocol:	No-procedure method	
(11)	Data Input Code:	ASCII code European character set 8 bit code Graphics 8 bit code	
(12)	Receive Buffer:	10K bytes	

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

① XON/XOFF (DC1/DC3) Protocol

- When initialized after the power is turned on, this printer becomes ready to receive data and sends an XON code (11H). (Transmission or non-transmission of the XON code is selectable by means of the parameter setting.)
- The printer sends an XOFF code (13H) when the blank positions in the receive buffer are 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 parameter setting.)
- The DTR signal is always “High” (READY).
- The RTS signal is always “High”.

② READY/BUSY (DTR) Protocol

- When initialized after the power is turned on, this printer becomes ready to receive data and turns the DTR signal to the “High” level (READY).
- The printer turns the DTR signal to the “Low” level (BUSY) when the blank positions in the receive buffer are 800 bytes or less.
- The printer turns the DTR signal to the “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.)
- The RTS signal is always “High”.

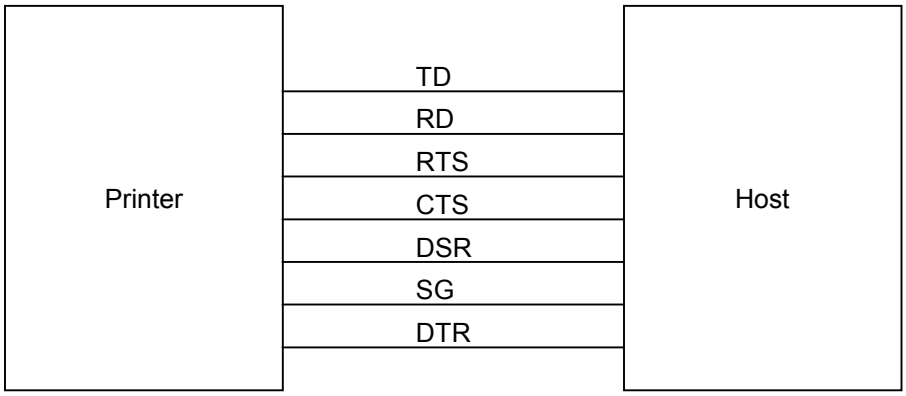
③ XON/XOFF (DC1/DC3) Protocol + READY/BUSY (DTR) Protocol

- When initialized after the power is turned on, this printer becomes ready to receive data and turns the DTR signal to the “High” level (READY). The printer 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 the “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 the “High” level (READY) and sends an XON code (11H).
- 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 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.
- The RTS signal is always “High”.

④ RTS Protocol

- When initialized after the power is turned on, the printer 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 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.)
- The DTR signal is always “High” (READY).

(14) Input/Output Signals

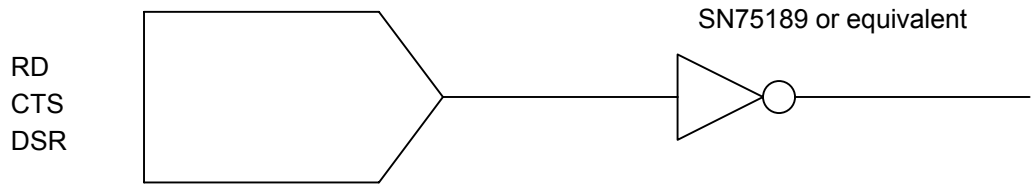


(15) Connector Pin Assignment and Signal Description

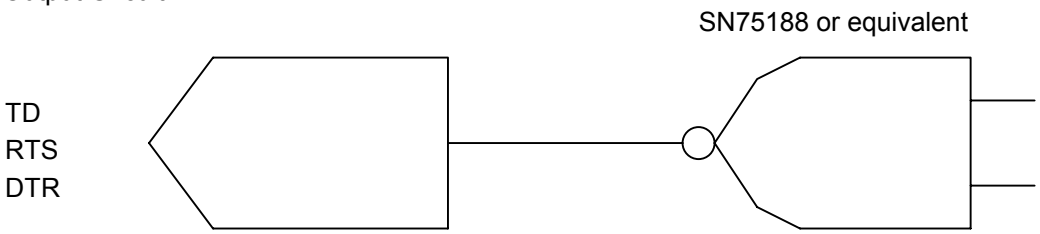
Pin No.	Signal Name	Function	Signal Direction
1	(N.C)		
2	TD	● Line for data which the printer sends to the host ● Logic 1 is a Low level, while logic 0 is a High level. ● It is in the Low (Mark) state when no transmission is in progress.	Printer →
3	RD	● Line for data which the printer receives from 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
4	DSR	● Input signal from the host ● For the printer to receive data, it must be at “High” level.	← Host
5	SG	● Ground line for all data and control signals	
6	DTR	● Output signal to the host For the READY/BUSY (DTR) protocol or XON/XOFF (DC1/DC3) protocol + READY/BUSY (DTR) protocol: ● It indicates the ready state for the received data. ● It is at the “Low” level when the receive buffer is near full, and at the “High” level when near empty. For the XON/XOFF (DC1/DC3) protocol or RTS protocol: ● After the power is turned on, it is always at “High”.	Printer →
7	CTS	● It is an input signal indicating whether or not the data transmission to the host is possible. However, this printer does not detect this signal.	← Host
8	RTS	● Output signal to the host For the RTS protocol: ● It indicates the ready state for the received data. ● It is at “Low” when the receive buffer is nearly full, and at “High” when nearly empty. For protocol other than the RTS protocol: ● After the power is turned on, it is always at the “High” level.	Printer →
9	(N.C)		

(16) Interface Circuit

- Input Circuit



- Output Circuit



- Signal Levels

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

3.2 PARALLEL INTERFACE

NOTE: *V1.0 does not support the nibble mode. The nibble mode will be supported in V1.1 or later.*

(1) Type: Centronics

(2) Mode: Conforms to IEEE1284 compatible mode and nibble mode

(3) Data Input Method: Parallel 8 bits (Data 1 ~ 8)

(4) Control Signals:

Compatible mode	Nibble mode
nStrobe	HostClk
nAck	PtrClk
Busy	PtrBusy
PError	AckDataReq
Select	Xflag
nAutoFd	HostBusy
nInit	nInit
nFault	nDataAvail
nSelectIn	IEEE1284 Active

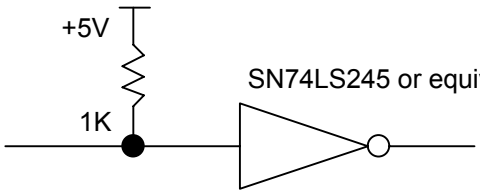
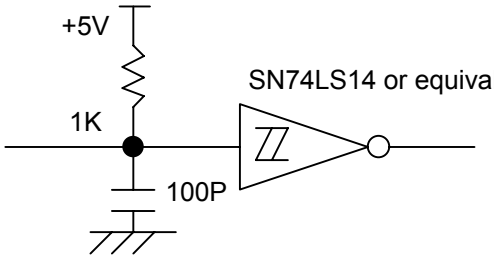
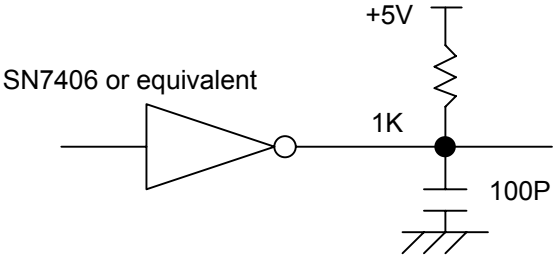
(5) Data Input Code: ASCII code
European character set 8 bit code
Graphics 8 bit code

(6) Data Output Code in the Nibble Mode:
ASCII code (8 bits)

(7) Receive Buffer: 10K bytes

(8) Send Buffer in the Nibble Mode: 13 bytes

(9) Input/Output Circuit Configuration and Input/Output Conditions:

	Signal	Configuration	
Input	Data 1 ~ 8		Logic level (Input) "1" = 2 ~ 5 V "0" = 0 ~ 0.4 V
	nStrobe/HostClk nInit/nInit nAutoFd/HostBusy nSelectIn/IEEE1284 Active		
Output	Busy/PtrBusy nFault/nDataAvail nAck/PtrClk Select/Xflag PError/AckDataReq		Logic level (Input) "1" = 2.4 ~ 5 V "0" = 0 ~ 0.4 V

(10) Connector: Printer

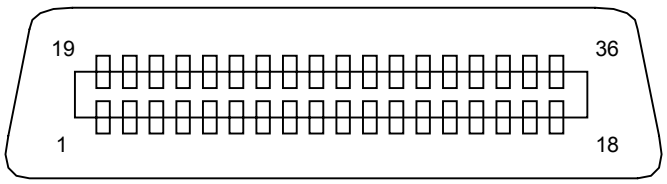
Amp. Japan	552742-1 or equivalent
DDK	57RE-40360-73B or equivalent

Cable

Amp. Japan	552470-1 or equivalent
DDK	57E-30360 or equivalent

(11) Connector Pin Diagram (IEEE1284-B Connector):

Pin No.	Signal Name	
	Compatible Mode	Nibble Mode
1	nStrobe	HostClk
2	Data 1	Data 1
3	Data 2	Data 2
4	Data 3	Data 3
5	Data 4	Data 4
6	Data 5	Data 5
7	Data 6	Data 6
8	Data 7	Data 7
9	Data 8	Data 8
10	nAck	PtrClk
11	Busy	PtrBusy
12	PError	AckDataReq
13	Select	Xflag
14	nAutoFd	HostBusy
15	NC	NC
16	0V	0V
17	CHASSIS GND	CHASSIS GND
18	+5V	+5V
19	TWISTED PAIR GND (PIN1)	TWISTED PAIR GND (PIN1)
20	TWISTED PAIR GND (PIN2)	TWISTED PAIR GND (PIN2)
21	TWISTED PAIR GND (PIN3)	TWISTED PAIR GND (PIN3)
22	TWISTED PAIR GND (PIN4)	TWISTED PAIR GND (PIN4)
23	TWISTED PAIR GND (PIN5)	TWISTED PAIR GND (PIN5)
24	TWISTED PAIR GND (PIN6)	TWISTED PAIR GND (PIN6)
25	TWISTED PAIR GND (PIN7)	TWISTED PAIR GND (PIN7)
26	TWISTED PAIR GND (PIN8)	TWISTED PAIR GND (PIN8)
27	TWISTED PAIR GND (PIN9)	TWISTED PAIR GND (PIN9)
28	TWISTED PAIR GND (PIN10)	TWISTED PAIR GND (PIN10)
29	TWISTED PAIR GND (PIN11)	TWISTED PAIR GND (PIN11)
30	TWISTED PAIR GND (PIN31)	TWISTED PAIR GND (PIN31)
31	nInit	nInit
32	nFault	nDataAvail
33	0V	0V
34	NC	NC
35	NC	NC
36	nSelectIn	IEEE1284 Active



NOTE: *The signal name starting with a lower case "n" indicates that it is a low active signal.*

(12) Input/Output Signals:

Compatible mode

① Data 1 ~ 8 (Printer ← Host)

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

② nStrobe (Printer ← Host)

- Synchronizing signal for reading the above data
- Normally at the “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 the power is turned on, the printer becomes ready to receive data and turns the signal to the “Low” level.
- The signal turns to the “High” level (in a Busy state) when data is set from the host (at the fall of the nStrobe signal).
- The signal turns to the “Low” level when the printer reads the data.
- When the blank positions in the receive buffer are 712 bytes or less, the printer keeps the signal at the “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 the “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 the “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 nInit signal

④ nAck (Printer → Host)

- This signal indicates that the printer has read the data set by the host and is ready to receive the next data.
- One of 2 types of timing for Ack can be selected.
- One is normally at “High”. The Ack signal should be sent to match the fall of the Busy signal and the end of the Low level of the Ack signal for about 0.7 µsec. The host should usually set data after the Ack signal is turned from “Low” to “High”, or after the fall of the Busy signal. (Default timing)
- The other is normally at “High”. It is at “Low” for about 5 µsec. after the fall of the Busy signal. The host should usually set data after the Ack signal is turned from “Low” to “High”.

⑤ nInit (Printer ← Host)

- Reset request signal from the host
- Normally at the “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 the nInit signal is input during printing, the printer completes printing one label which is being printed, cancels the next processing, then is initialized in the same manner as when the power is turned on.
- Minimum pulse width of 0.5 µsec

⑥ Select (Printer → Host)

- This is an output signal which indicates whether the printer is in a Pause state or placed online. The printer can receive data while placed online.
- The signal is at the “Low” level while the printer is in a Pause state.
- The signal is kept at the “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 nInit signal

⑦ nFault (Printer → Host)

- Output signal indicating that the printer is in a Fault state
- At the “Low” level while the printer is in a Fault state.
- The signal is kept at the “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 nInit signal

⑧ PError (Printer → Host)

- Output signal indicating a label end state or ribbon end state.
- At the “High” level when the printer is in a label end state or ribbon end state.
- Turns to the “Low” level when the label end state 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 nSelectIn (Printer ← Host)

- Not used

⑪ nAutoFd (Printer ← Host)

- Not used

Nibble mode

① Data 1 ~ 8 (Printer ← Host)

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

② HoltClk (Printer ← Host)

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

③ PtrBusy (Printer → Host)

- Reverse data transfer phase: Data bit 3 is used for the first transfer. Data bit 7 is used for the second transfer. Indicates the forward channel is in a Busy state.

④ PtrClk (Printer → Host)

- Reverse data transfer phase: It is used for evaluating data sent to the host.
- Forward idle phase: When the printer changes the signal from Low to High, an interrupt informing the host that the data is available, occurs.

⑤ nInit (Printer ← Host)

- Reset request signal from the host.
- Normally at the “High” level. When the signal becomes low, the printer enters an initial state obtained from when the power is turned ON.
- If the “nInit” signal is input during printing, the printer cancels the next process after printing one label which is being printed, then enters an initial state obtained from when the power is turned ON.
- Minimum pulse width of 0.5 μsec

⑥ Xflag (Printer → Host)

- Reverse data transfer phase: Data bit 1 is used for the first transfer. Data bit 5 is used for the second transfer.

⑦ nDataAvail (Printer → Host)

- Reverse data transfer phase: When the signal is low, it indicates the printer has data to be sent to the host. And it is used for sending data bits 0 and 4.
- Reverse idle phase: It is used for indicating that the data is available.

⑧ AckDataReq (Printer → Host)

- Reverse data transfer phase: Data bit 2 is used for the first transfer. Data bit 6 is used for the second transfer.
- Reverse idle phase: This signal is set to high until data transfer is requested by the host. After that, the process is performed according to the nDataAvail signal.

⑨ +5 V

- This is not a signal but a +5 V power supply voltage.
- The maximum current of 500 mA can be used for external equipement.

⑩ IEEE1284 Active (Printer ← Host)

- The signal is used with the HostBusy signal, to request the data transfer in the IEEE1284 mode, or to request the end of the IEEE1284 mode.
- To request the data transfer in the IEEE1284 mode, the host sets the IEEE1284 Active signal and the HostBusy signal to high and low, respectively.
- To request the end of the IEEE1284 mode, the host sets the IEEE1284 Active signal and the HostBusy signal to low and high, respectively.

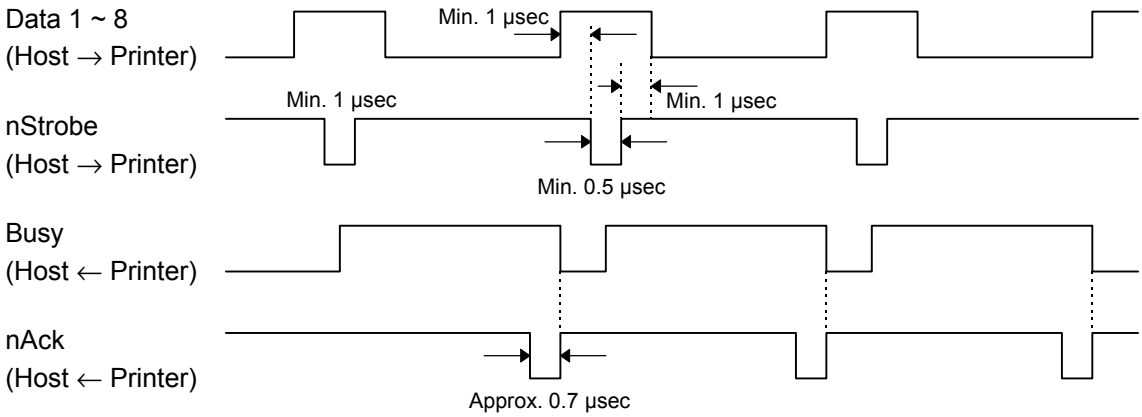
⑪ HostBusy (Printer ← Host)

- Reverse data transfer phase: It indicates that the host can receive data from the printer by setting the signal to low. After that, the host sets the signal to high, and sends the Ack indicating that the nibble data is received. When the signal is set to low after the reverse channel data transfer is performed, the interface phase changes to the idle phase. At that time, there is no available data on the printer.
- Reverse idle phase: When this signal is set to high according to the low pulse of the PtrClk signal, the host enters the reverse data transfer phase again. If this signal is set to high when the IEEE1284 Active signal is low, the IEEE1284 idle phase stops, and the interface enters the compatible mode.

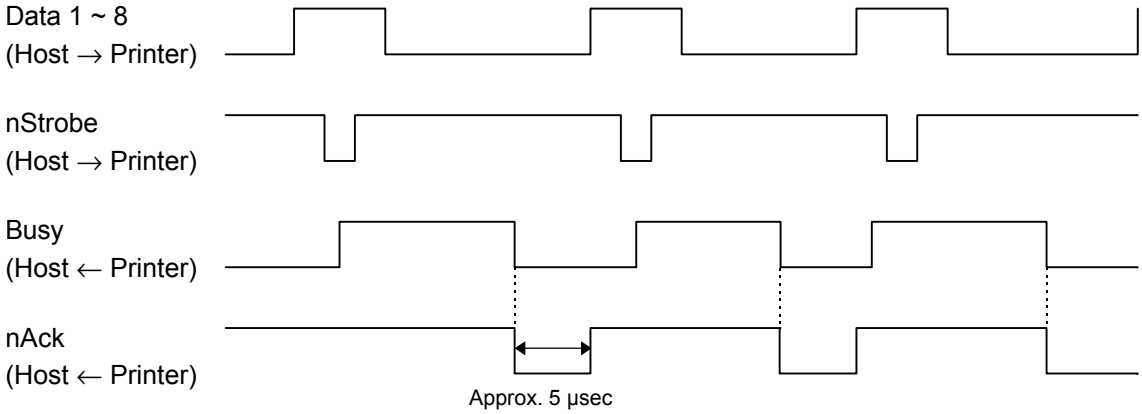
(13) Timing Chart

① When receiving normal data:
One of two types of timing for BUSY-ACK can be selected.

(1) Timing 1 (Default)

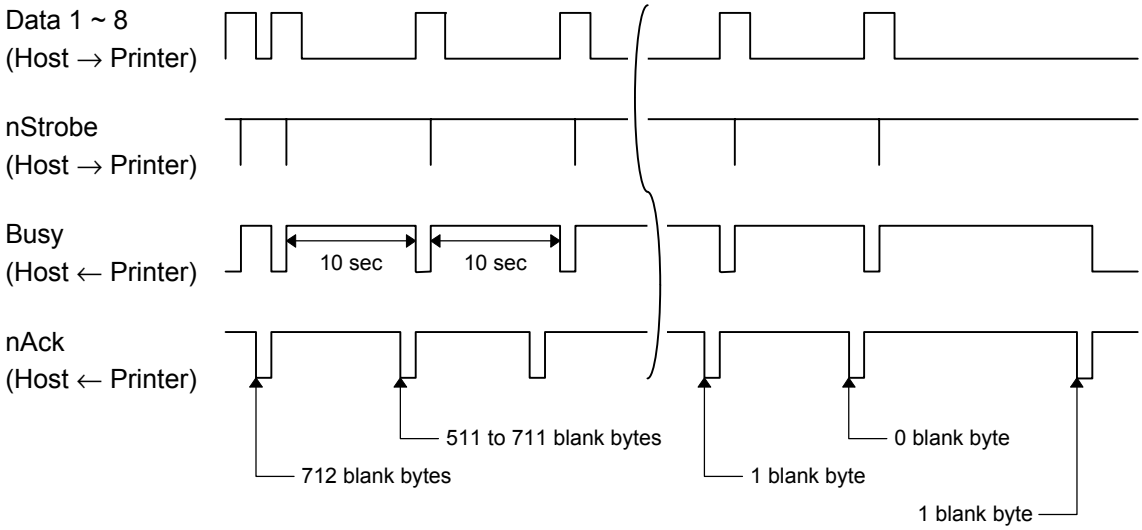


(2) Timing 2



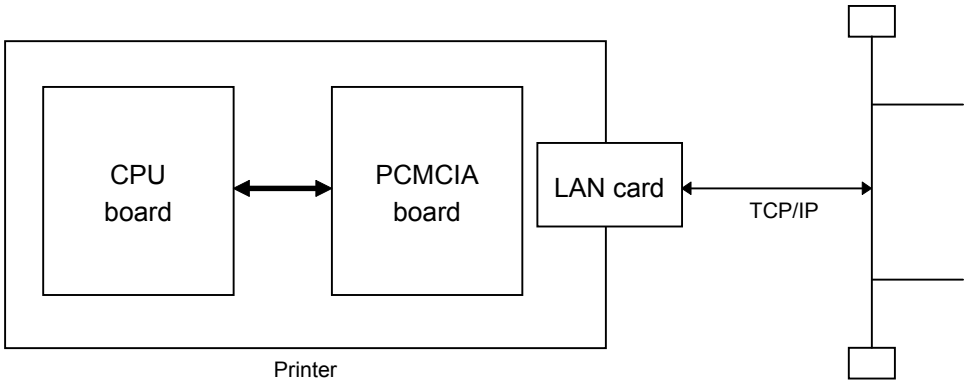
② Receiving data when the blank positions in the receive buffer are 712 bytes or less:

- When the blank positions in the receive buffer are 712 bytes or less, the printer stores the received data in the receive buffer, continues to be in a BUSY state (BUSY signal at the “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 become 713 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 the “High” level) until there are blank positions in the receive buffer when data is set from the host.

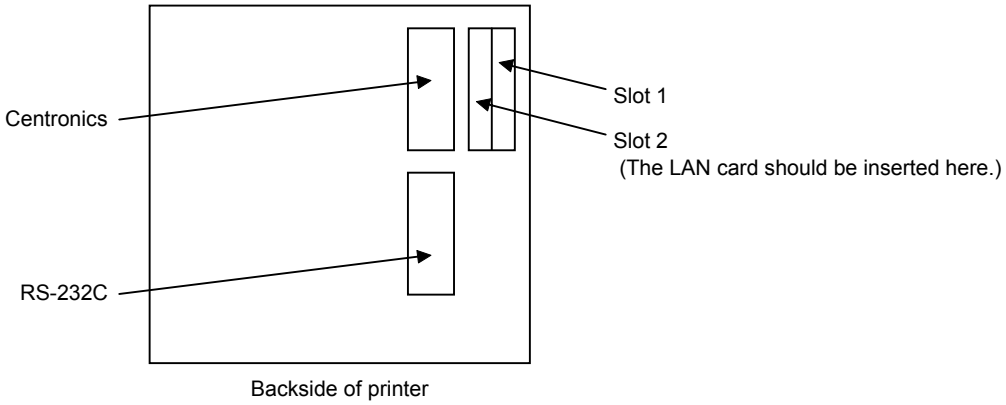


3.3 NETWORK INTERFACE

(1) Connection Diagram



There are two slots (slot 1 and slot 2) for the PC card on the PCMCIA board. The LAN card should be inserted in slot 2. If it is inserted in slot 1, it will not function.



(2) Applicable LAN Card: LAN PC Card manufactured by 3COM
Model: 3CCE589ET series

(3) Protocol: TCP/IP

(4) Items for Settings:
Printer IP address (Initial value: 192.168.10.20)
Subnet mask (Initial value: 0xffffff00)
Gateway IP address (Initial value: 0.0.0.0)

(5) Printer Daemon: This printer starts up as a LPR server.

(6) HTTP Server: This printer can be used for the Internet as an HTTP server to browse a home page for following information.

- TOP menu
  - Status (Idling/Error)
  - Remaining length of ribbon
  - Head up/down state
  - Label sensor state
  - Temperature sensor state
  - Maintenance counter

(7) Socket communication: This printer can make socket communications using the specified port number.

(8) Mail transmission/reception: This printer can send/receive commands, and notify the host of the printer status by e-mail.

(9) FTP server function: This printer can be operated remotely with a FTP client.

* For details, refer to the Network Specification (TAA-1323).

4. KEY OPERATION FUNCTIONS

4.1 SYSTEM MODE FUNCTIONS

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

(1) Self-test

- Maintenance counter, various parameters printout
- Automatic self-test
- Head broken dots check

(2) Various parameter settings

- Type of character code
  - PC-850
  - PC-852
  - PC-857
  - PC-8
  - PC-851
  - PC-855
  - PC-1250
  - PC-1251
  - PC-1252
  - PC-1253
  - PC-1254
  - PC-1257
  - LATIN9
  - Arabic
- Selection of font 0
  - without slash mark [0]
  - with slash mark [Ø]
- RS-232C communication speed
  - 2400 bps
  - 4800 bps
  - 9600 bps
  - 19200 bps
- RS-232C data length
  - 7 bits
  - 8 bits
- RS-232C parity
  - NONE
  - EVEN
  - ODD

- RS-232C transmission control
  - XON/XOFF protocol: (No XON output when the power is on, no XOFF output when the power is off)
  - READY/BUSY (DTR) protocol: (No XON output when the power is on, no XOFF output when the power is off)
  - XON/XOFF + READY/BUSY (DTR) protocol: (XON output when the power is on, XOFF output when the power is off)
  - XON/XOFF protocol: (XON output when the power is on, XOFF output when the power is off)
  - RTS protocol: (No XON output when the power is on, no XOFF output when the power is off)
- Language for LCD messages
  - ENGLISH
  - GERMAN
  - FRENCH
  - DUTCH
  - SPANISH
  - JAPANESE
  - ITALIAN

  NOTE: *When Japanese is selected, the character cords partially differ.*
- Forward feed standby after an issue
  - ON (Performed)
  - OFF (Not performed)

  NOTE: *If the printer is in the idle state for 1 second or more after an issue is performed when ON is selected, the printer automatically performs a 19-mm forward feed, then stops. This setting is used to prevent curled labels from being entangled with the cutter or the platen, or to cut labels manually.*
- Type of control code
  - Automatic selection (ESC, LF, NUL/{, |, })
  - Manual selection (ESC, LF, NUL mode)
  - Manual selection ({, |, } mode)
  - Any set code
- [FEED] key function
  - FEED: Feeds one label.
  - PRINT: Prints data of image buffer on one label.
- Kanji code selection
  - TYPE1
  - TYPE2
- Euro code (new currency symbol) setting
  - 20H to FFH
- Automatic head broken dots check
  - ON (When the power is turned on, the broken dots check is automatically performed.)
  - OFF (When the power is turned on, the broken dots check is not automatically performed.)

- Centronics ACK/BUSY timing setting
  - TYPE1
  - TYPE2
- Web printer function setting
  - ON (Web printer function is enabled.)
  - OFF (Web printer function is disabled.)
- Silent printing function setting
  - ON (Silent printing function is enabled.)
- Keyboard (KB-80) connection setting
  - ON (The keyboard is connected.)
  - OFF (The keyboard is not connected.)

(3) Various fine adjustment value settings

- Feed fine adjustment (± 50.0 mm)
- Cut position (or stop position of the strip issue) fine adjustment (± 50.0 mm)
- Back feed fine adjustment (± 9.5 mm)
- X-coordinate fine adjustment (± 99.5 mm)
- Print density fine adjustment
  (Thermal transfer/Direct thermal print modes) (± 10)
- Lower reflective sensor manual threshold fine adjustment (0.0 V to 4.0 V)
- Transmissive sensor manual threshold fine adjustment (0.0 V to 4.0 V)
- Ribbon motor drive voltage fine adjustment (Rewind) (-15 to +6)
- Ribbon motor drive voltage fine adjustment (Back tension) (-15 to +10)

(4) Test print

(5) Sensor display/adjustment

- Thermal head temperature sensor display
- Open-air temperature sensor display
- Heat sink sensor display
- Upper reflective sensor display/adjustment
- Lower reflective sensor display/adjustment
- Transmissive sensor display/adjustment
- Lower reflective sensor adjustment value setting (without paper)
- Transmissive sensor adjustment value setting (without paper)

(6) RAM clear

- Maintenance counter clear
- Parameter clear

(7) IP address setting

- Printer IP address
- Gateway IP address
- Subnet mask

(8) PCL emulation setting

- PCL emulation ON/OFF
  - Print speed
  - Sensor type
  - Print type
  - Issue type
  - Media setting

(9) BASIC interpreter setting

- BASIC interpreter ON/OFF
- Trace function ON/OFF

(10) 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
Ribbon motor drive time	0 hour
RS-232C hardware 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 stop position of the strip issue) fine adjustment (PC)	0 mm
Back feed fine adjustment (PC)	0 mm
Print density fine adjustment (Thermal transfer print mode) (PC)	0
Print density fine adjustment (Direct thermal print mode) (PC)	0
Ribbon motor drive voltage fine adjustment (Rewind) (PC)	0
Ribbon motor drive voltage fine adjustment (Back tension) (PC)	0
Feed fine adjustment (Key)	0 mm
Cut position (or stop position of the strip issue) fine adjustment (Key)	0 mm
Back feed fine adjustment (Key)	0 mm
Print density fine adjustment (Thermal transfer print mode) (Key)	0
Print density fine adjustment (Direct thermal print mode) (Key)	0
Ribbon motor drive voltage fine adjustment (Rewind) (Key)	0
Ribbon motor drive voltage fine adjustment (Back tension) (Key)	0
X-coordinate fine adjustment (Key)	0 mm

Parameter		Initial Value
Transmissive sensor manual threshold fine adjustment value		1.4 V
Reflective sensor manual threshold fine adjustment value		1.0 V
Type of character code		PC-850
Font of 0		“0” (without slash mark)
Type of control code		Auto
Communication speed		9600 bps
Data length	QP type	8 bits
	QQ type	7 bits
Parity	QP type	NONE
	QQ type	EVEN
Transmission control	QP type	XON/XOFF + READY/BUSY (DTR) protocol: (XON output when the power is on, XOFF output when the power is off)
	QQ type	READY/BUSY (DTR) protocol
Language for LCD messages	QP type	English
	QQ type	English
Forward feed standby after an issue		ON
Automatic head broken dots check		OFF
[FEED] key function		FEED
Status response		ON
Label pitch		76.2 mm
Effective print length		74.2 mm
Effective print width		216.8 mm
Print type		Thermal transfer print mode
Type of sensor		Transmissive sensor
Feed speed		4”/sec
Issue mode		Batch (without cutting)
PC save automatic call		ON
Kanji code		TYPE1
Euro code		B0H
Centronics ACK/BUSY timing setting		TYPE1
Web printer function		OFF
Silent printing function	QP type	ON
	QQ type	ON
PCL emulation		OFF
Keyboard (KB-80) connection setting		OFF
BASIC interpreter function		OFF
BASIC trace function		OFF

- The total label distance covered, sensor adjustment values (system mode <5>), IP address setting and data of the flash memory card, are not cleared by RAM clear.

4.2 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
(8) Various parameters setting
(9) Various fine adjustment value settings

4.3 DOWNLOAD MODE SETTING FUNCTION

When the power is turned on by pressing the [FEED], [PAUSE], and [RESTART] keys at the same time, the printer enters the download mode. Therefore, the usual operations cannot be performed.

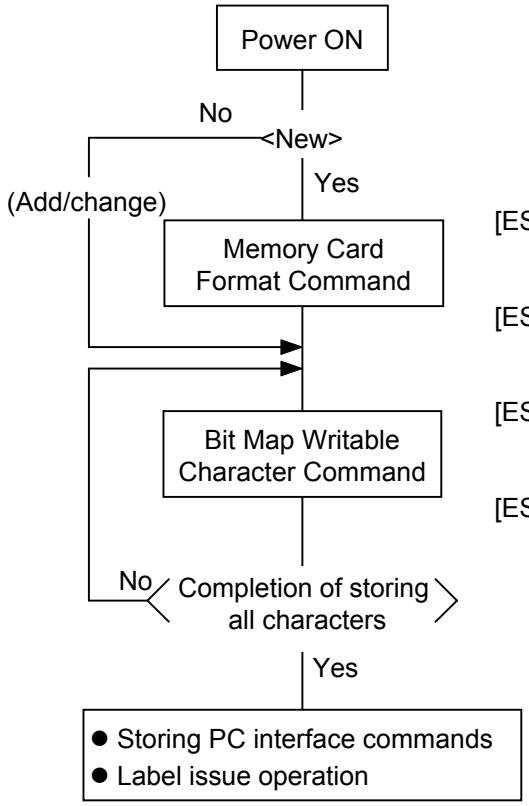
5. TRANSMISSION SEQUENCE

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



[ESC] J1: Formats the 4-MB flash memory card (manufactured by Maxell).

or

[ESC] JA: Formats the ATA card.

[ESC] XD: Stores writable characters or logos on the flash memory card.

[ESC] XA: Stores writable characters or logos on the ATA card.

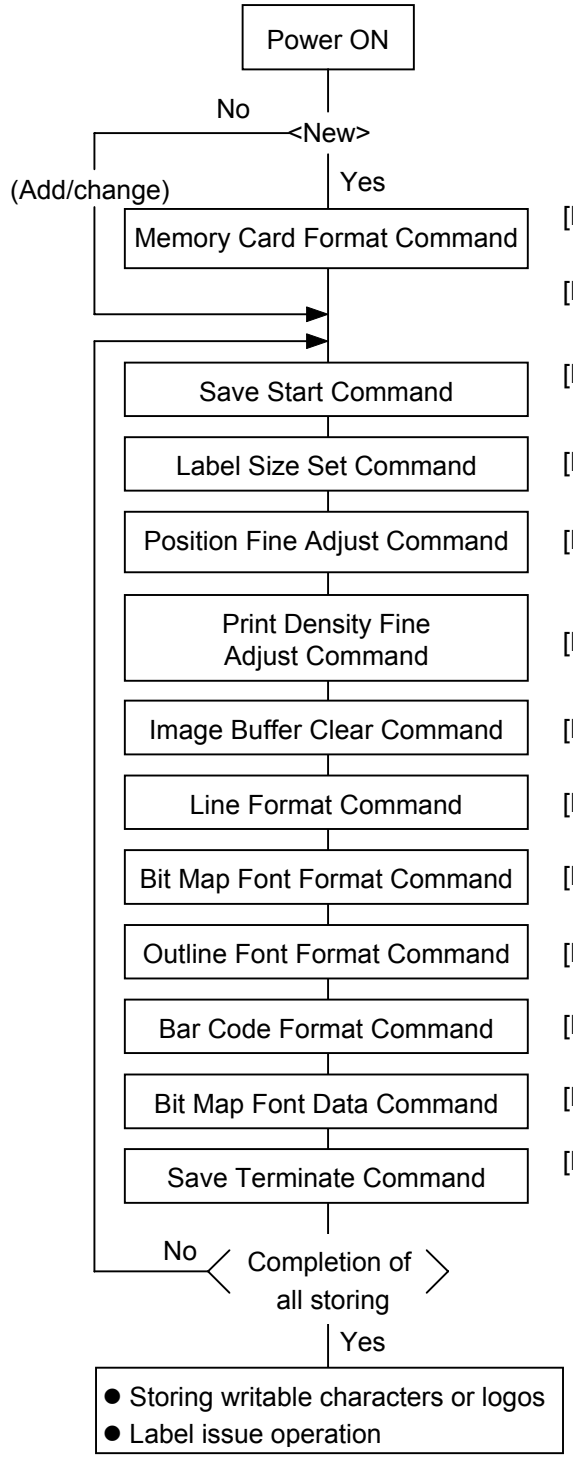
NOTES: *(1) The storage of PC commands is only performed if it is required.*

(2) When the flash memory card is used, and the Memory Card Format Command is not sent before storing already stored writable characters or logos, memory will be taken up with every such storing.

(3) When the flash memory card is used, and another operation (storing PC interface commands or label issue operation) is performed after storing writable characters or logos, the image buffer will be cleared automatically.

(4) If another storing operation does not take place after storing writable characters or logos, the printer automatically enters the online mode (label issue operation) after about 10 seconds. In this case, when the flash memory card is used, the image buffer will be automatically cleared.

(2) Storing PC interface commands



[ESC] J1: Formats the flash memory card.
or
[ESC] JA: Formats the ATA card.

[ESC] XO, [ESC] XV: Declares the start of saving PC interface commands.

[ESC] D: Sets the label size.

[ESC] AX: Adjusts the feed length, cut position, and back feed length.

[ESC] AY: Adjusts the print density.

[ESC] C: Clears the image buffer.

[ESC] LC: Sets the line format and draws it.

[ESC] PC: Sets the bit map font format.

[ESC] PV: Sets the outline font format.

[ESC] XB: Sets the bar code format.

[ESC] RC: Draws data of the bit map font.

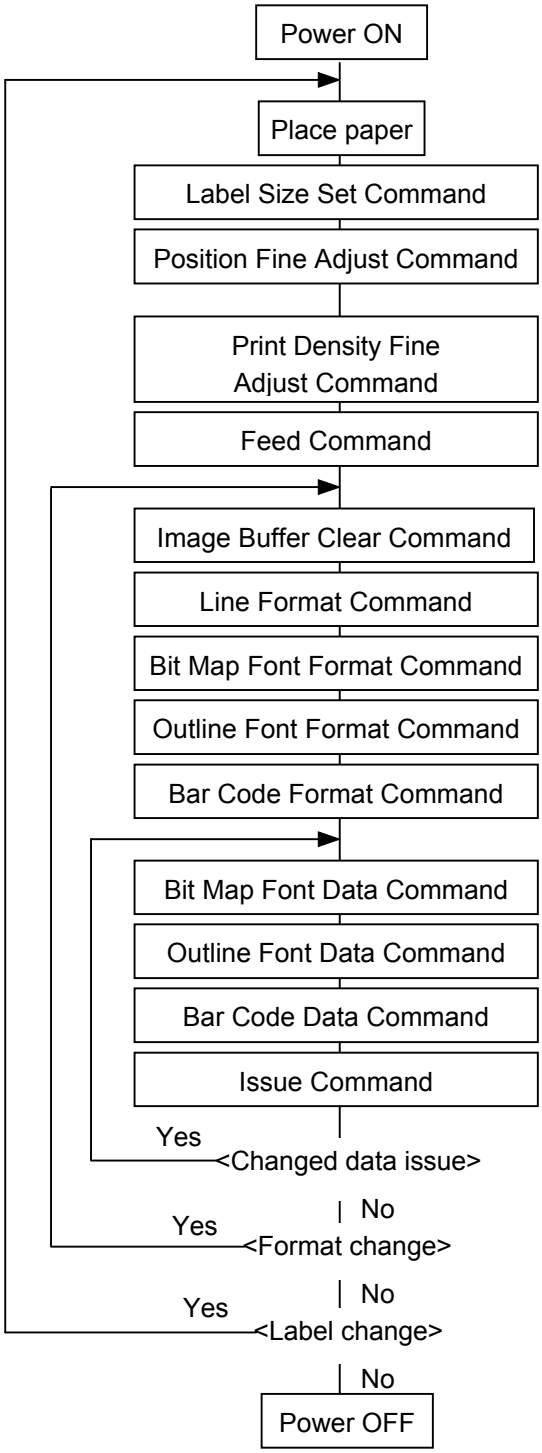
[ESC] XP: Declares the termination of saving PC interface commands.

NOTES: *(1) The storage of PC interface commands is only performed if it is required.*
(2) When the flash memory card is used, and the Memory Card Format Command is not sent before storing already stored PC interface commands, memory will be taken up with every such storing.
(3) When the flash memory card is used, and another operation (storing writable characters or logos, label issue operation) is performed after storing PC interface commands, the image buffer will be cleared automatically.
(4) Select commands to be stored as the occasion demands.
(5) If another storing operation does not take place after storing PC interface commands, the printer enters the online mode (label issue operation) after about 10 seconds. In this case, when the flash memory card is used, the image buffer will be automatically cleared.

5.2 LABEL ISSUE OPERATION

An example of the label issue operation is described below.

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



[ESC] D: Sets the label size.

[ESC] AX: Adjusts the feed length, cut position, and back feed length.

[ESC] AY: Adjusts the print density.

[ESC] T: Feeds one sheet of paper and aligns it with the first printing position.

[ESC] C: Clears the image buffer.

[ESC] LC: Sets the line format and draws it.

[ESC] PC: Sets the bit map font format.

[ESC] PV: Sets the outline font format.

[ESC] XB: Sets the bar code format.

[ESC] RC: Draws bit map font data.

[ESC] RV: Draws outline font data.

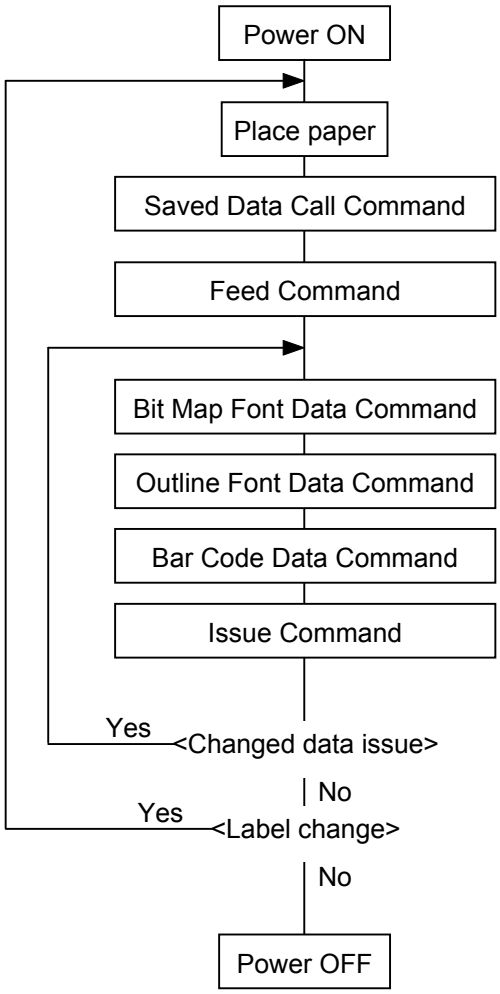
[ESC] RB: Draws bar code data.

[ESC] XS: Issues (prints) the label.

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 on, the Label Size Set Command and Feed Command may be omitted.*

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

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



[ESC] XQ: Calls the label format stored in the flash memory card.

or

[ESC] XT: Calls the label format stored in the ATA card.

[ESC] T: Feeds one sheet of paper and aligns it with the first printing position.

[ESC] RC: Draws bit map font data.

[ESC] RV: Draws outline font data.

[ESC] RB: Draws bar code data.

[ESC] XS: Issues (prints) the label.

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 on, the Feed Command may be omitted.*

(2) If the option for "automatic call at power on" for the Saved Data Call Command has previously been selected, the Saved Data Call Command may be omitted after the power is turned off and on.

(3) When the XML data is used:

Print data in XML format can be sent to the printer.

* For details, refer to the XML Data Print Specification (TAA-1320).

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 Code set in the system mode

(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.

[ESC] T20C40 [LF] [NUL]

The above corresponds to the transfer of the following:

1B	54	32	30	43	34	30	0A	00
[ESC]	T	2	0	C	4	0	[LF]	[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's operation will not be guaranteed. The commands must be used in the online mode. If any command is transmitted in the system mode, the printer will not operate. However, only the Reset Command can be used.

6.2 LIST OF COMMANDS

6.2.1 Commands for Creating Application

(1)	Commands related to setting	
	Label Size Set Command	[ESC] D
(2)	Commands related to fine adjustment	
	Position Fine Adjust Command	[ESC] AX
	Print Density Fine Adjust Command	[ESC] AY
	Ribbon Motor Drive Voltage Fine Adjust Command	[ESC] RM
(3)	Commands related to clear	
	Image Buffer Clear Command	[ESC] C
	Clear Area Command	[ESC] XR
(4)	Commands related to drawing format setting	
	Line Format Command	[ESC] LC
	Bit Map Font Format Command	[ESC] PC
	Outline Font Format Command	[ESC] PV
	Bar Code Format Command	[ESC] XB
(5)	Commands related to print data	
	Bit Map Font Data Command	[ESC] RC
	Outline Font Data Command	[ESC] RV
	Bar Code Data Command	[ESC] RB
(6)	Commands related to issue and feed	
	Issue Command	[ESC] XS
	Feed Command	[ESC] T
	Eject Command	[ESC] IB
	Forward/Reverse Feed Command	[ESC] U1, [ESC] U2
(7)	Commands related to writable characters	
	Storage Area Allocate Command	[ESC] XF
	Memory Card Format Command (for flash memory card)	[ESC] J1
	Memory Card Format Command (for ATA card)	[ESC] JA
	2-byte Writable Character Code Range Command	[ESC] XE
	Bit Map Writable Character Command (for flash memory card)	[ESC] XD
	Bit Map Writable Character Command (for ATA card)	[ESC] XA
(8)	Commands related to graphics	
	Graphic Command	[ESC] SG
(9)	Commands related to PC command saving	
	Memory Card Format Command (for flash memory card)	[ESC] J1
	Memory Card Format Command (for ATA card)	[ESC] JA
	Save Start Command (for flash memory card)	[ESC] XO
	Save Start Command (for ATA card)	[ESC] XV
	Save Terminate Command	[ESC] XP
	Saved Data Call Command (for flash memory card)	[ESC] XQ
	Saved Data Call Command (for ATA card)	[ESC] XT
(10)	Commands related to check	
	Head Broken Dots Check Command	[ESC] HD

(11) Commands related to display

Message Display Command	[ESC] XJ

(12) Commands related to control

Reset Command	[ESC] WR

(13) Commands related to status

Status Request Command	[ESC] WS
Version Information Acquire Command	[ESC] WV
ATA Card Information Acquire Command	[ESC] WI
ATA Card Writable Character Information Acquire Command	[ESC] WG

(14) Commands related to TCP/IP setting

IP Address Set Command	[ESC] IP
Socket Communication Port Set Command	[ESC] IS

6.2.2 Commands for System Administrator

Parameter Set Command	[ESC] Z2; 1
Fine Adjustment Value Set Command	[ESC] Z2; 2
Batch Reset Command	[ESC] Z0

6.3 COMMANDS FOR CREATING APPLICATION

6.3.1 Label Size Set Command [ESC] D

Function Sets the size of a label or tag.

Format [ESC] Daaaa, bbbb, cccc [LF] [NUL]

Term

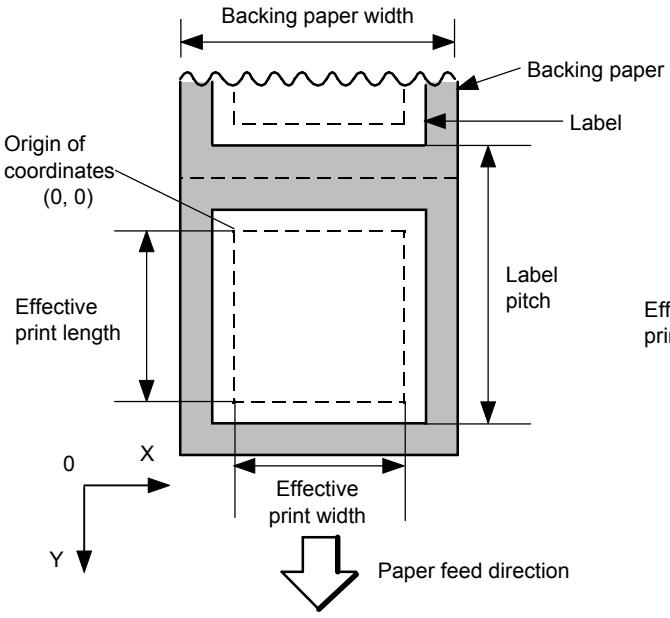
aaaa: Pitch length of the label or tag
4 or 5 digits (in 0.1 mm units)
4 digits: Max. 9990 (999.0 mm)
5 digits: Max. 09990 (999.0 mm)

bbbb: Effective print width
Fixed as 4 digits (in 0.1 mm units)

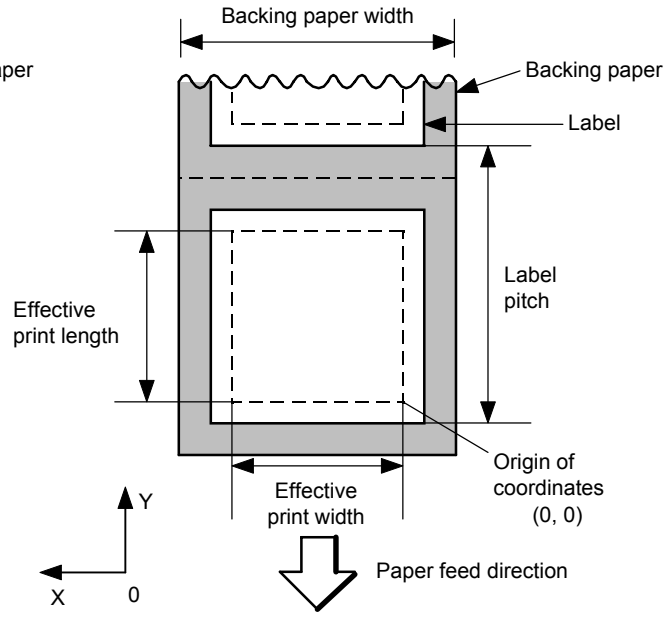
cccc: Effective print length
4 or 5 digits (in 0.1 mm units)
4 digits: Max. 6400 (640.0 mm)
5 digits: Max. 06400 (640.0 mm)

Explanation

[Labels]

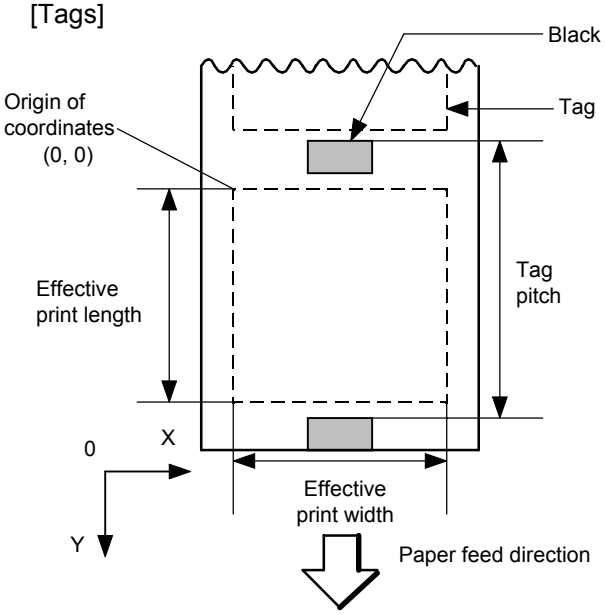


[Print direction: Printing bottom first]

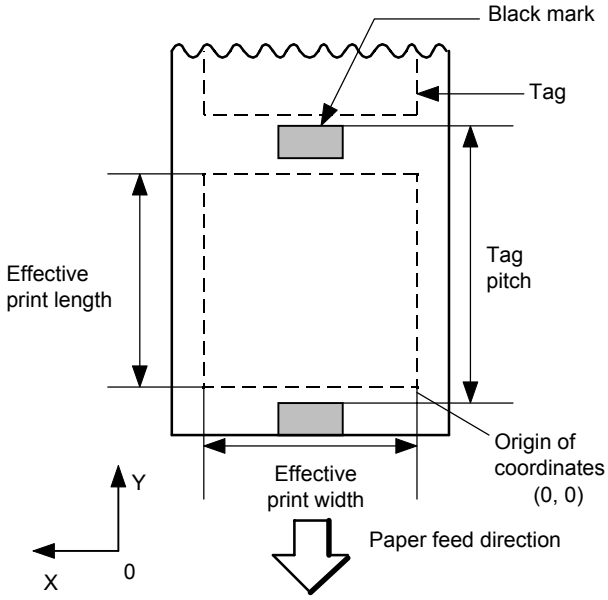


[Printing direction: Printing top first]

[Tags]

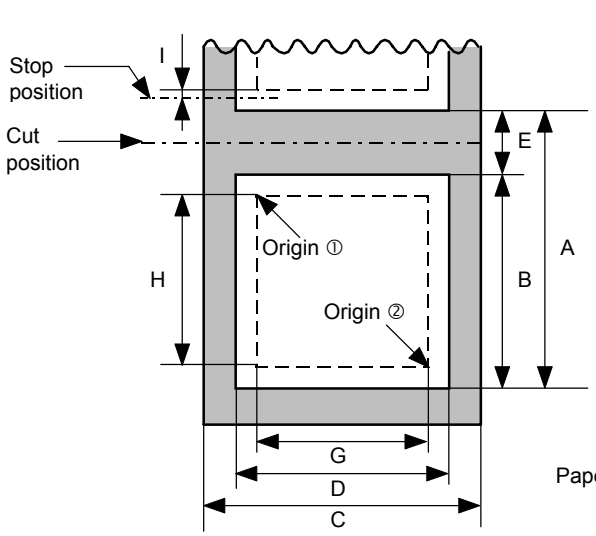


[Print direction: Printing bottom first]

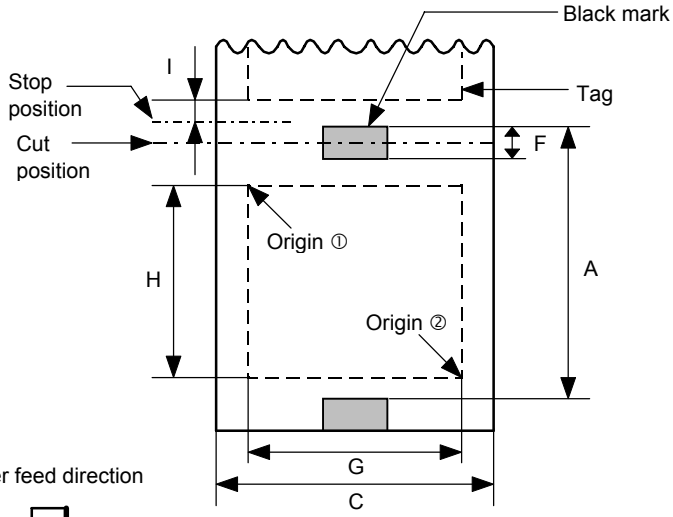


[Printing direction: Printing top first]

[Setting range]



[Labels]



[Tags]

[mm]

Item \ Model / Method			B-850		
			Batch issue	Cut issue	Strip issue for auto labeler *1
Thermal head dot density			11.8 dots/mm		
Thermal head width			216.8 mm		
A: Label pitch Tag pitch	Label	Min.	15.0	38.0	25.4
		Max.	999.0	999.0	999.0
	Tag	Min.	15.0	25.4	–
		Max.	999.0	999.0	–
B: Label length		Min.	13.0	25.0 *2	23.4
		Max.	997.0	993.0	997.0
C: Backing paper width Tag width		Min.	100.0	100.0	100.0
		Max.	242.0	235.0	242.0
D: Label width		Min.	97.0	97.0	97.0
		Max.	239.0	232.0	239.0
E: Label-to-label gap		Min.	2.5	6.0	2.5
		Max.	20.0	20.0	20.0
F: Black mark length		Min.	2.0	2.0	2.0
		Max.	10.0	10.0	10.0
G: Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
H: Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0
I: Slow up/down interval	Slow up		1.0	1.0	1.0
	Slow down		1.0	1.0	1.0
Max. effective print length for on-the-fly issue			320.0	320.0	320.0

"1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

*2: When a cut issue is performed, 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 (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 print 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 the strip issue mode for the auto labeler, 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 the system mode.

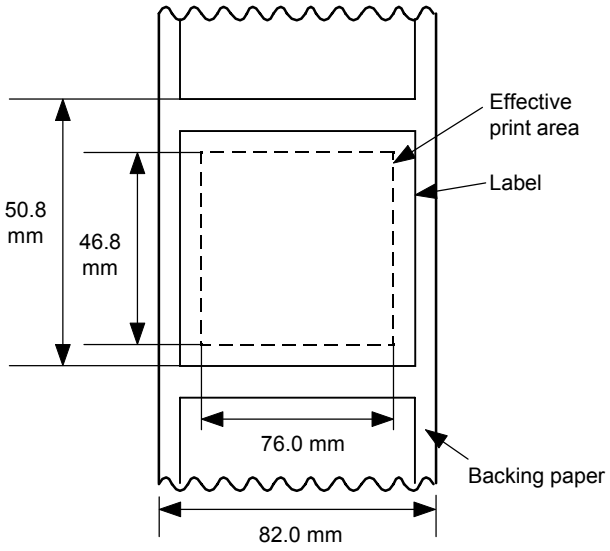
(7) The tag rotation designation of the Issue Command ([ESC] XS) causes the origin of drawing coordinates to be origin ① in the case of “printing bottom first” and to be origin ② in the case of “printing top first”, as shown in the figure on the preceding page.

(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 issue” 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.

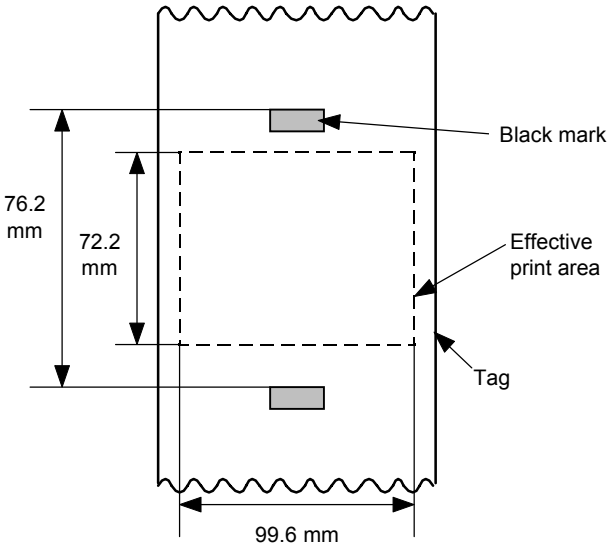
Examples

(1) Labels



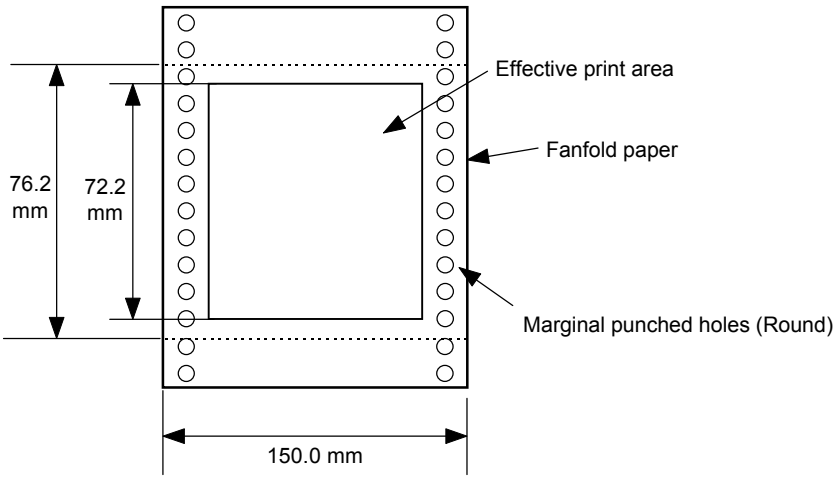
[ESC] D0508, 0760, 0468, 0820 [LF] [NUL]
[ESC] T20C40 [LF] [NUL]

(2) Tags



[ESC] D0762, 0996, 0722 [LF] [NUL]
[ESC] T10C40 [LF] [NUL]

(3) Fanfold paper



[ESC] D0762, 1500, 0722 [LF] [NUL]
[ESC] T60C40 [LF] [NUL]

6.3.2 Position Fine Adjust Command [ESC] AX

Function

① Adjusts the feed value so that the label shifts forward or backward from the automatically set first print start position.

② Adjusts the cut position so that the label will be cut at a position shifted forward or backward from the automatically set cut position, or adjusts the stop position of the strip issue so that the label shifts forward or backward from the automatically set stop position of the strip issue.

③ Adjusts the value for feeding the label back to the home position after cutting, or adjusts the value for feeding the label back to the home position from the stop position of the strip issue.

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 length fine adjustment value
000 to 500 (in 0.1 mm units)

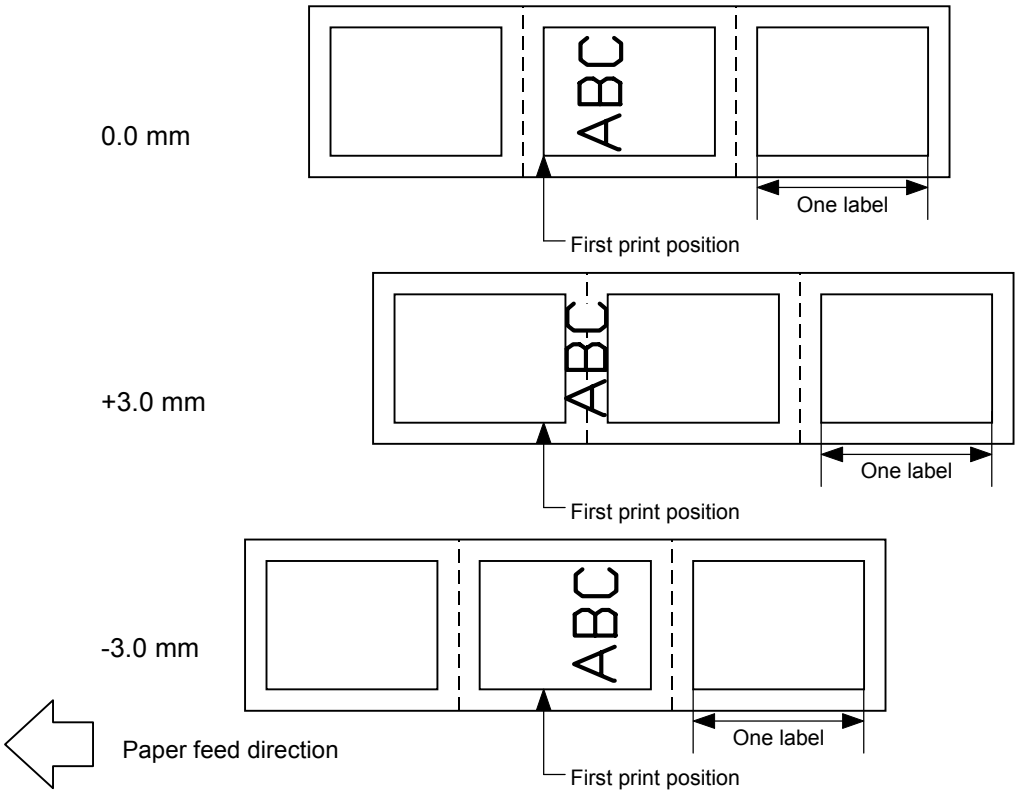
c: Indicates the direction, forward or backward, in which a cut position (or stop position of the strip issue) fine adjustment is to be made.
- +: Backward
- -: Forward

ddd: Amount for finely adjusting the cut position (or stop position of the strip issue).
000 to 500 (in 0.1 mm units)

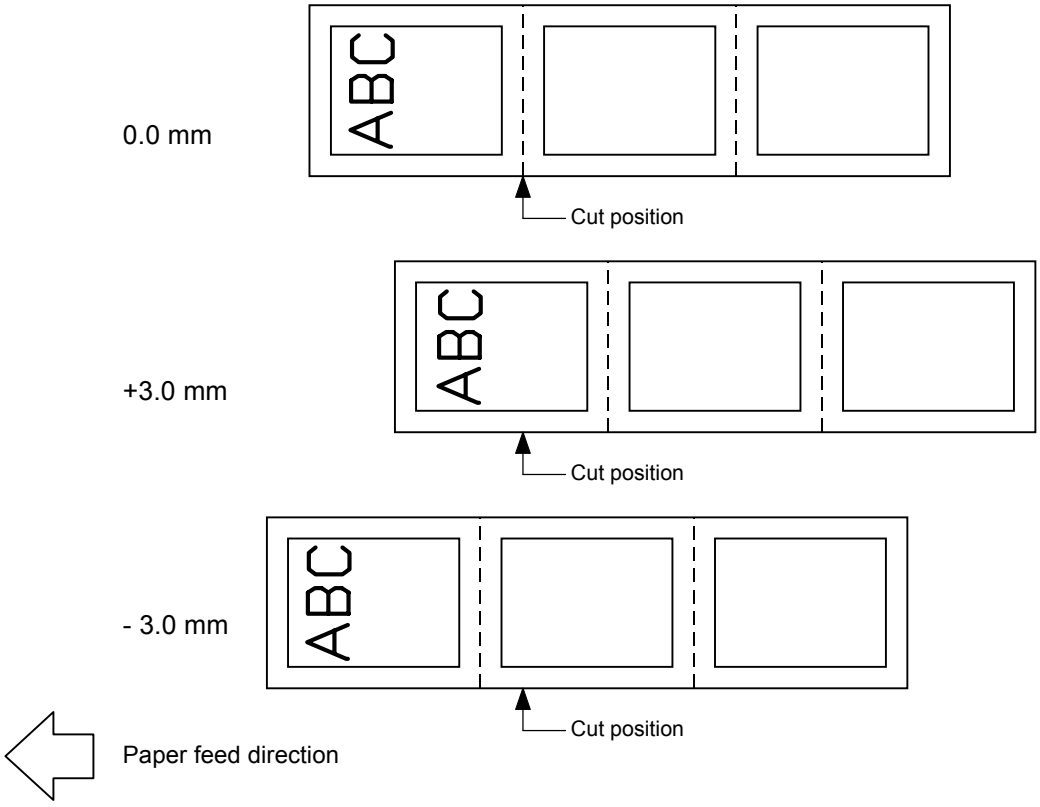
e: Indicates whether the back feed length is to be increased or decreased.
- +: Increase
- -: Decrease

ff: Amount for finely adjusting the back feed.
00 to 99 (in 0.1 mm units)

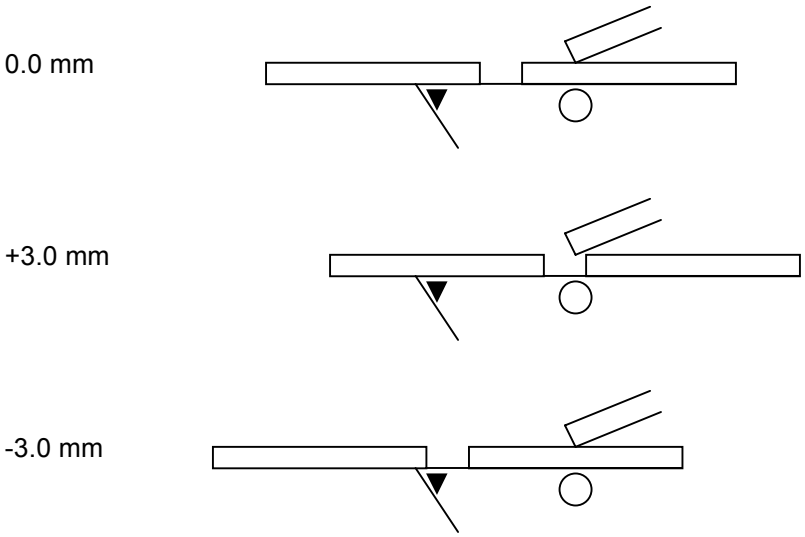
Explanation [Feed Length Fine Adjustment] (To finely adjust the feed for shifting backward or forward)

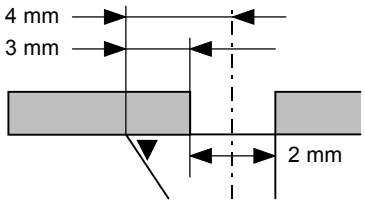


[Cut Position Fine Adjustment] (To finely adjust the cut position for shifting backward or forward)



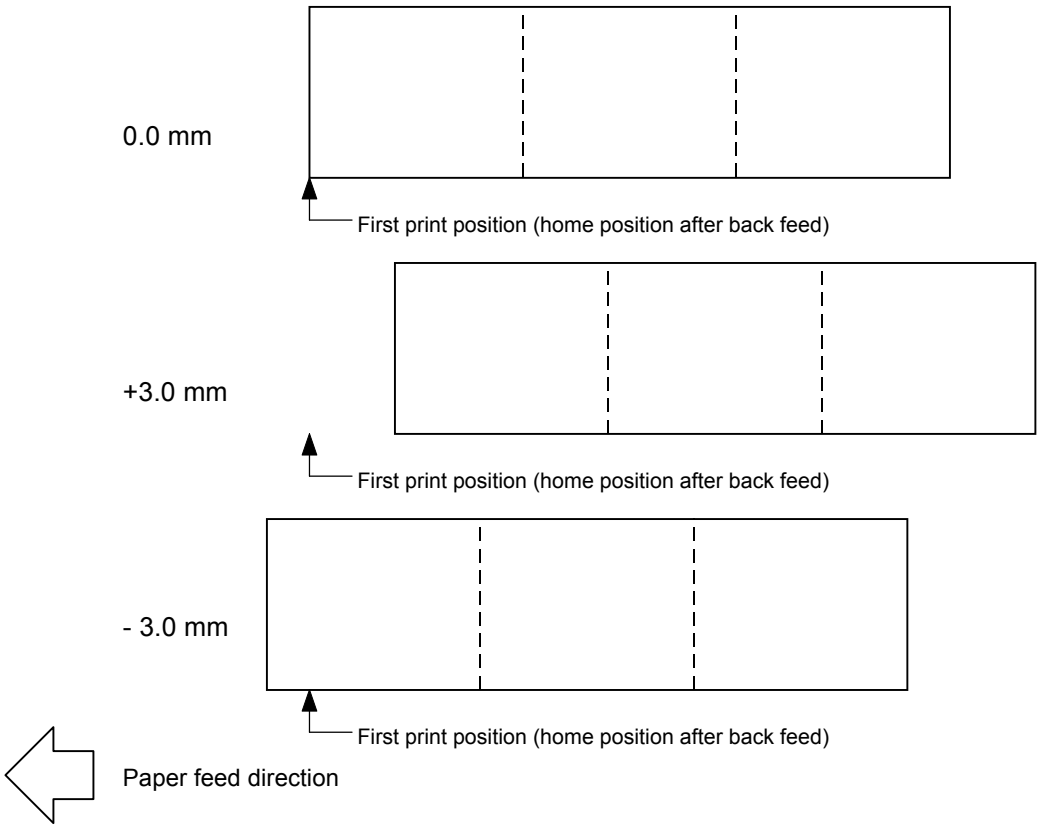
[Fine Adjustment of Stop Position of Strip Issue]





- Printing in the strip issue mode for the auto labeler stops at the position where the distance from the middle point of the label-to-label gap to the end 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 fine adjustment function of the stop position of the strip issue.
- 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 fine adjustment function of the stop position of the strip issue.

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



Notes

(1) If the feed length fine adjustment, cut position (or stop position of the strip issue) fine adjustment, or back feed fine adjustment has been set in the system mode (key operation on the printer), the fine adjustment value will be the sum of the fine adjustment by the Fine Adjust Command, and the fine adjustment in the system mode.
The max. fine adjustment values are as follows. However, the max. feed length fine adjustment value is limited within the label pitch.

Feed length fine adjustment..... ±50.0 mm
Cut position (or stop position of the strip issue) fine adjustment .... ±50.0 mm
Back feed fine adjustment ..... ±9.9 mm

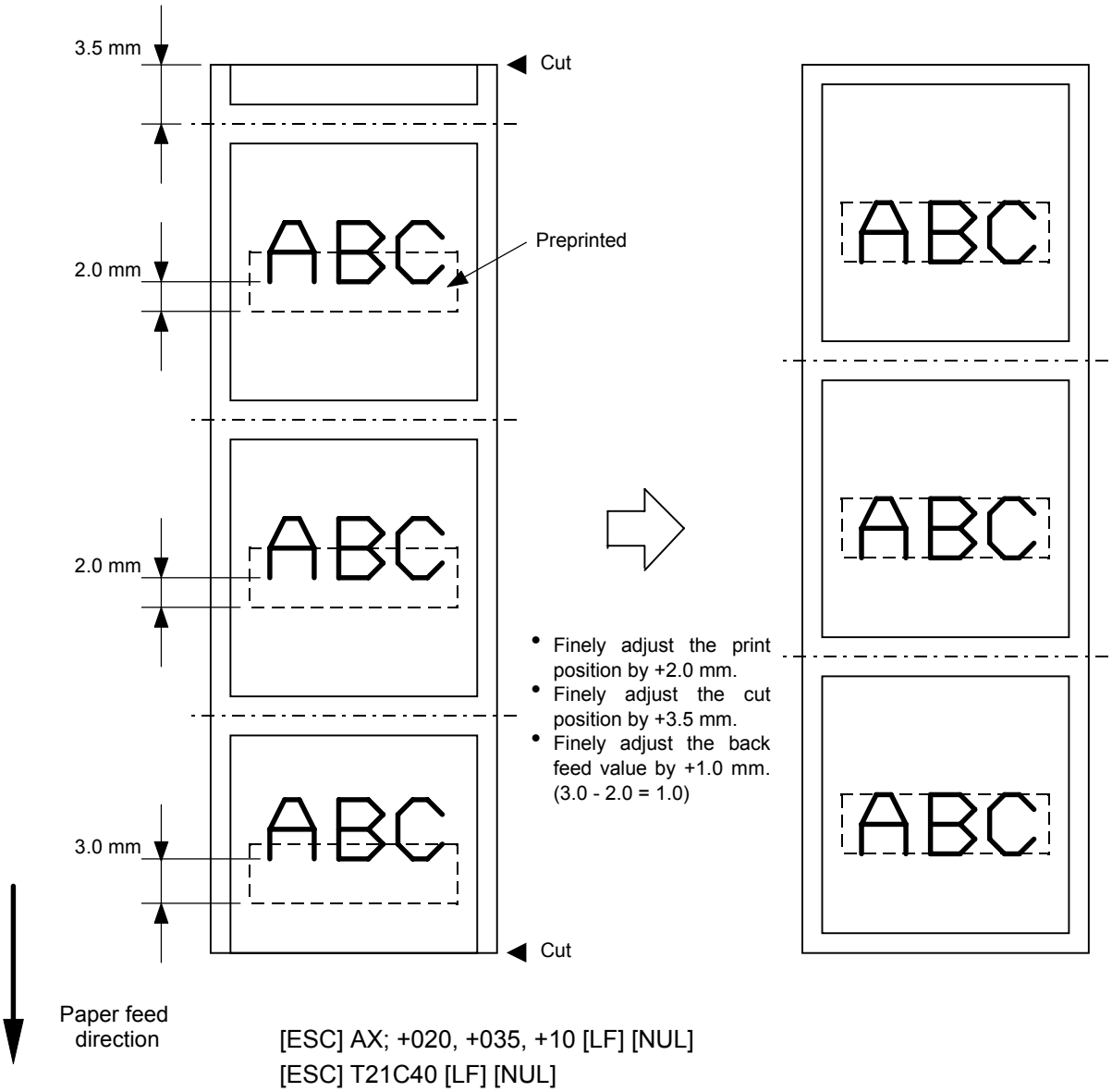
(2) After changing the fine adjustment value by this command, one label must be fed by the Feed Command ([ESC] T) to adjust the first print position.

(3) Each fine adjustment value is protected in memory (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 print 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 for the auto labeler, the print position may differ between the first label and the second label. The back feed fine adjustment is used to adjust the length so that the label is correctly fed back to the position placed before the forward feed is performed.)

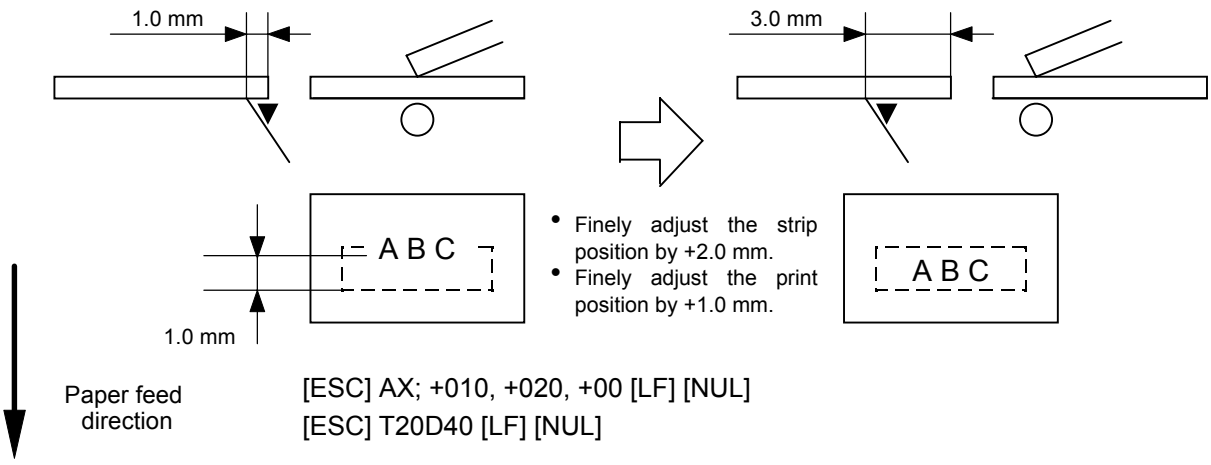
(5) The cut position (or stop position of the strip issue) fine adjustment and back feed fine adjustment are effective only when the printer is in the cut issue mode or the strip issue mode for the auto labeler.

Examples (1) Cut issue



[ESC] AX; +020, +035, +10 [LF] [NUL]
[ESC] T21C40 [LF] [NUL]

(2) Strip issue for auto labeler



[ESC] AX; +010, +020, +00 [LF] [NUL]
[ESC] T20D40 [LF] [NUL]

6.3.3 Print Density Fine Adjust Command [ESC] AY

Function Adjusts the print density which was automatically set.

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

(1) The print density fine adjustment is performed by adjusting the time that voltage is applied to the thermal head.

(2) If the print density 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 fine adjustment by this command and the fine adjustment in system mode. The maximum fine adjustment values are ±10 for the thermal transfer print mode, and +6 or -10 for the direct thermal print mode.

(3) The fine adjustment values in thermal transfer print mode and direct thermal print mode, can be set independently.

(4) The Print Density Fine Adjust Command is protected in memory (even if the power is turned off).

(5) The fine adjustment value for both the fine adjust command and the system mode fine adjustment is “00” at time of shipping from the factory.

Examples To set the density in thermal transfer print mode to -2.

[ESC] AY; -02, 0 [LF] [NUL]

To set the density in direct thermal print mode to +3.

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

6.3.4 Ribbon Motor Drive Voltage Fine Adjust Command [ESC] RM

Function Adjusts the drive voltage of the ribbon motor.

Format [ESC] RM; abbcdd [LF] [NUL]

Term

a: Fine adjustment direction of the ribbon rewind motor
+: Positive (The voltage is raised.)
-: Negative (The voltage is lowered.)

bb: Fine adjustment value for the ribbon rewind motor
Fine adjustment direction is "+":
00 to 6 (in units of 1 step)
Fine adjustment direction is "-":
00 to 15 (in units of 1 step)

c: Fine adjustment direction of the ribbon back tension motor
+: Positive (The voltage is raised.)
-: Negative (The voltage is lowered.)

dd: Fine adjustment value for the ribbon back tension motor
Fine adjustment direction is "+":
00 to 10 (in units of 1 step)
Fine adjustment direction is "-":
00 to 15 (in units of 1 step)

Explanation

(1) If wrinkles occur on the ribbon, they can be prevented by adjusting the ribbon motor drive voltage by this command.

(2) -1 step corresponds to -5% of the standard drive voltage.

(3) The ribbon motor drive voltage fine adjustment value is protected in memory (even if the power is turned off).

(4) If the ribbon motor drive voltage fine adjustment value has been set in the system mode (key operation on the printer), the fine adjustment values for the ribbon motors (rewind/back tension) will be the sum of the fine adjustment in the system mode and the fine adjustment by this command. The maximum fine adjustment values are +6 (+30%) or -15 (-75%) for the ribbon rewind motor, and +10 (+50%) or -15 (-75%) for the ribbon back tension motor.

(5) When RAM clear is performed, the fine adjustment values for both fine adjust commands (rewind/back tension) and the system mode are "00".

(6) The fine adjustment values for both fine adjust commands (rewind/back tension) and the system mode are "00" at the time of shipment from the factory.

Example To set the value for the ribbon motor (rewind) to -3, and the value for the ribbon motor (back tension) to -2.

[ESC] RM; -03-02 [LF] [NUL]

6.3.5 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

(1) After changing the label size, the image buffer must be cleared.

(2) The increment/decrement designation (described later) is valid until the Image Buffer Clear Command is transmitted.

(3) The link field designation (described later) is effective until the Image Buffer Clear Command is sent.

Examples

[ESC] D0508, 0760, 0468 [LF] [NUL]
[ESC] T20C41 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] RC000; ABC [LF] [NUL]
[ESC] RC001; DEF [LF] [NUL]
[ESC] XS; I, 0001, 0002C4000 [LF] [NUL]

6.3.6 Clear Area Command [ESC] XR

Function Clears the designated area or reverses the white/black dot pattern in the designated area in the drawing area.

Format [ESC] XR; aaaa, bbbb, cccc, dddd, e [LF] [NUL]

Term

aaaa: Designated area start point X-coordinate
Fixed as 4 digits (in 0.1 mm units)

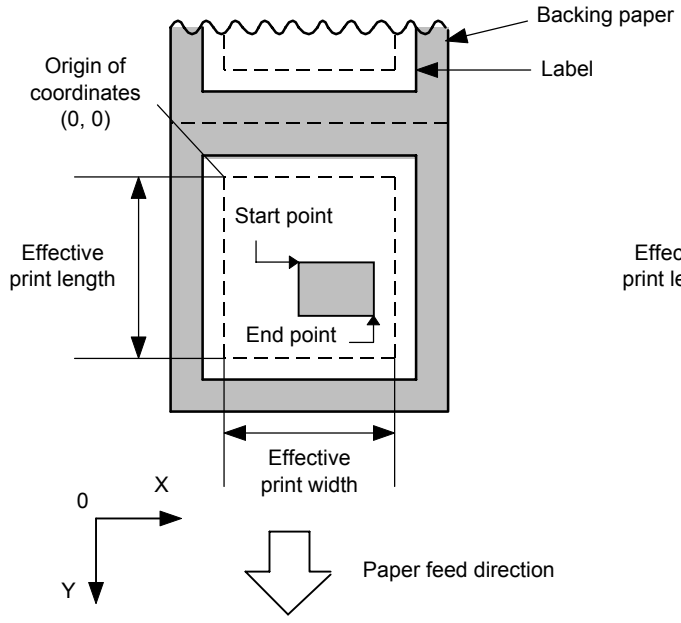
bbbb: Designated area start point Y-coordinate
4 or 5 digits (in 0.1 mm units)

cccc: Designated area end point X-coordinate
Fixed as 4 digits (in 0.1 mm units)

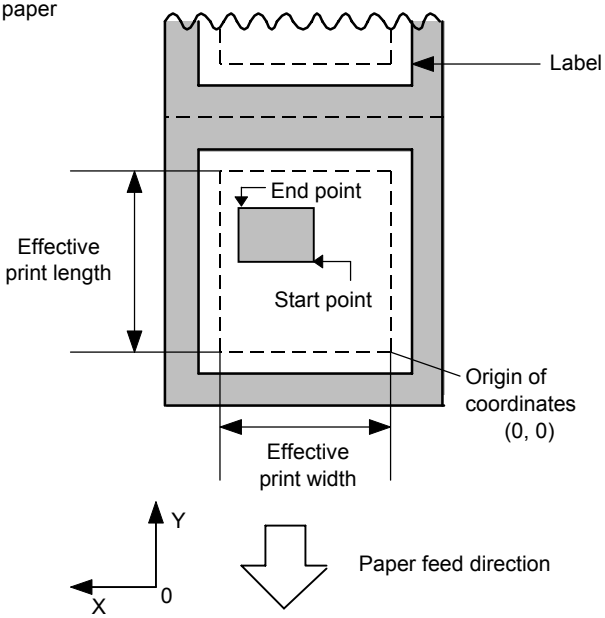
dddd: Designated area end point Y-coordinate
4 or 5 digits (in 0.1 mm units)

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.
(Black area after reversed is evenly solid.)
C: Reverses the white/black dot pattern in the designated area.
(Black area after reversed is not evenly printed in black.)

Explanation



[Print direction: Printing bottom first]



[Print direction: Printing top first]

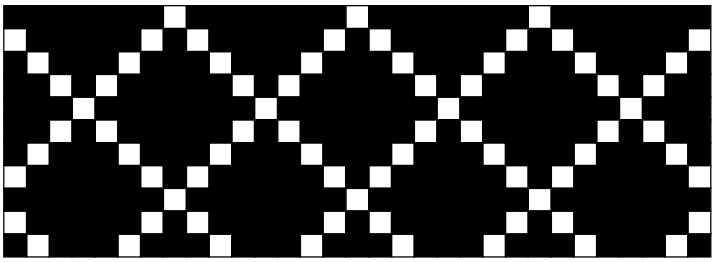
Notes

(1) The result is the same even if the start and end point coordinates are reversed.

(2) The result is the same even if the start 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).

(4) When the black area after reversed is not evenly printed in black, it is printed as shown below:

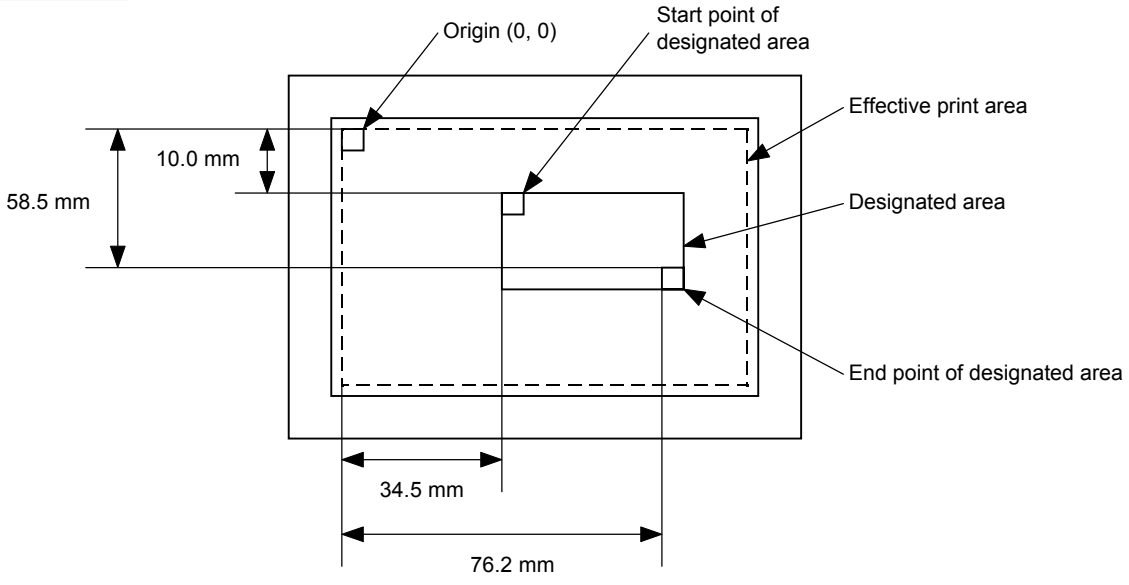


[Effective print area] [mm]

Item \ Model		Method	B-850 Batch issue	B-850 Cut issue	B-850 Strip issue for auto labeler *1
Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0

"1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

Examples



[ESC] XR; 0345, 0100, 0762, 0585, A [LF] [NUL]
[ESC] RC000; ABC [LF] [NUL]
[ESC] RC001; DEF [LF] [NUL]
[ESC] XS; I, 0001, 0002C4000 [LF] [NUL]

6.3.7 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

aaaa: Start point X-coordinate
Fixed as 4 digits (in 0.1 mm units)

bbbb: Start point Y-coordinate
4 or 5 digits (in 0.1 mm units)

cccc: End point X-coordinate
Fixed as 4 digits (in 0.1 mm units)

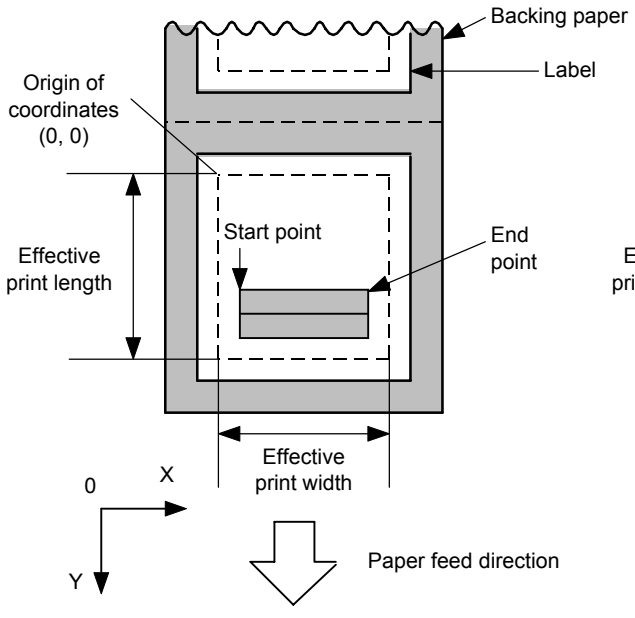
dddd: End point Y-coordinate
4 or 5 digits (in 0.1 mm units)

e: Type of line
0: Line: Horizontal line (not jagged), vertical line (not jagged), slant line
1: Rectangle (not jagged)
2: Line: Horizontal line (jagged), vertical line (jagged), slant line
3: Rectangle (jagged)

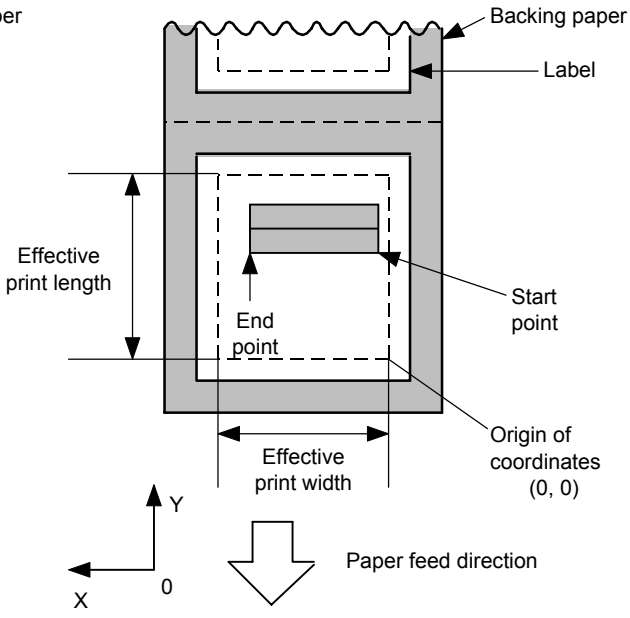
f: No. of line width dots
1 to 9 (in 0.1 mm units)

ggg: Radius of rounded corners of rectangles
(Omissible. If omitted, the chamfering process for rectangle corners is not performed.)
Fixed as 3 digits (in 0.1 mm units)

Explanation



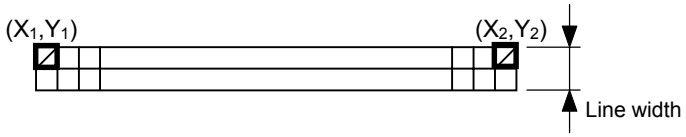
[Print direction: Printing bottom first]



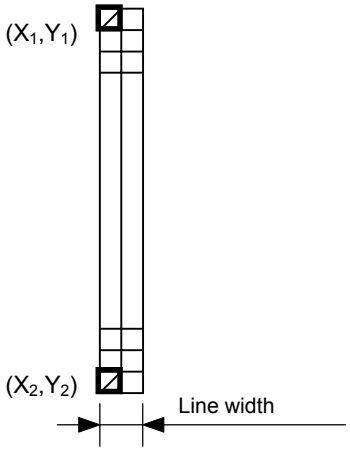
[Print direction: Printing top first]

[Line]

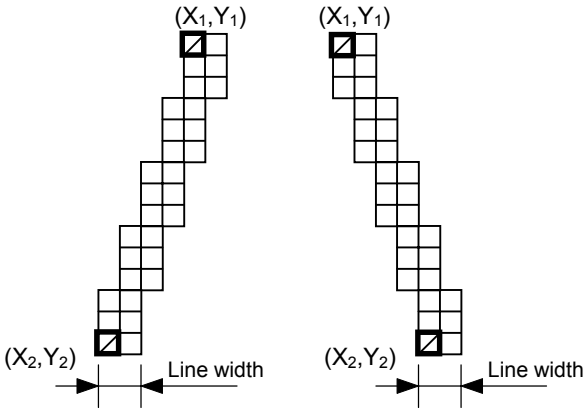
(1) Horizontal line (In the case of $|Y_2 - Y_1| = 0$)



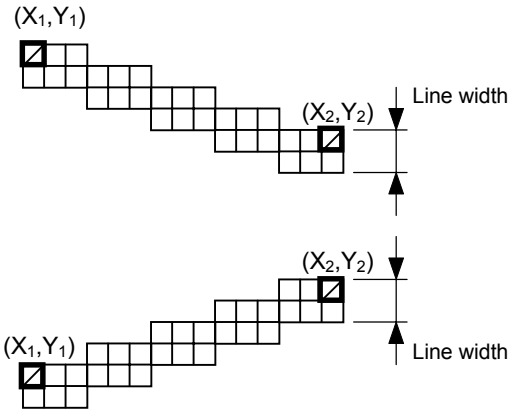
(2) Vertical line (In the case of $|X_2 - X_1| = 0$)



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

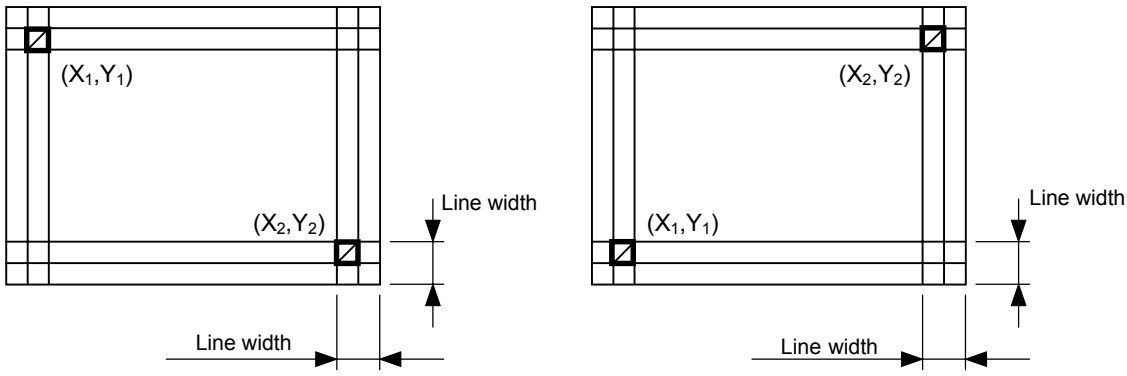


(4) Slant line B ($|X_2 - X_1| > |Y_2 - Y_1|$)

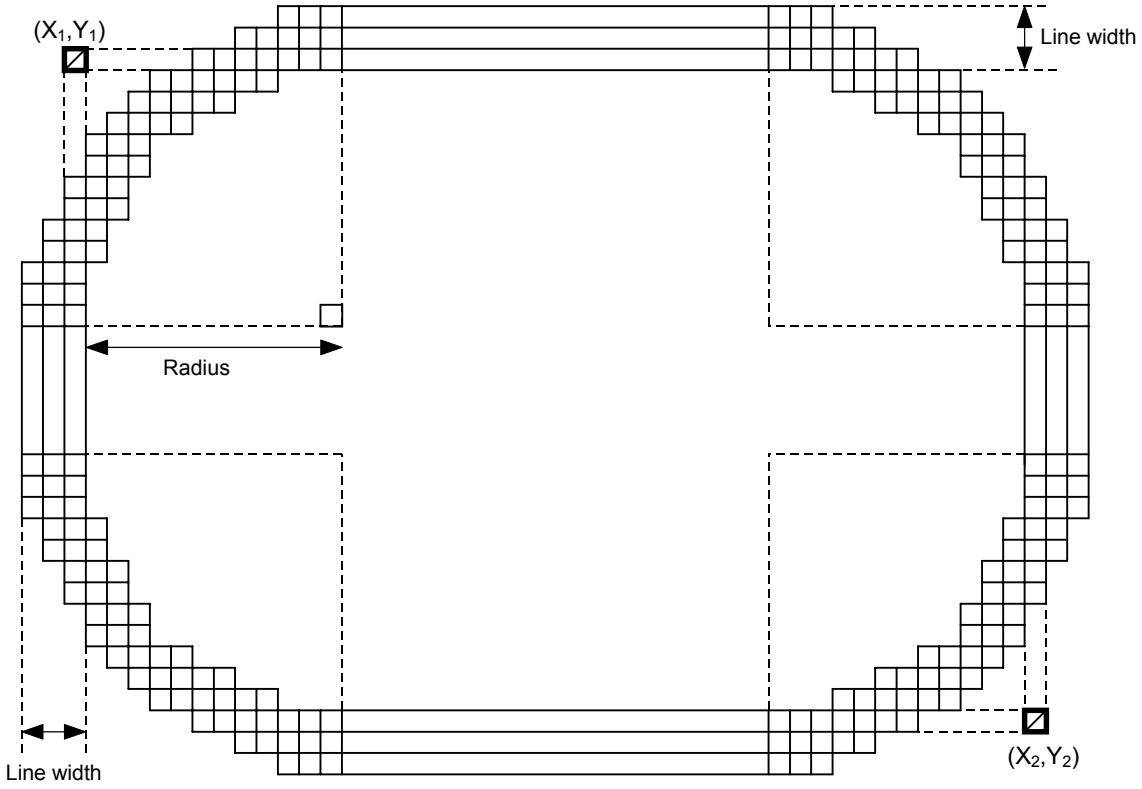


[Rectangle]

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



(2) Radius of rounded corners ≠ 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:

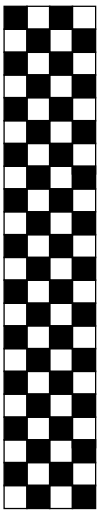
$$\frac{|X_2 - X_1|}{2} = \frac{|Y_2 - Y_1|}{2} \leq \text{[Radius of rounded corners]}$$

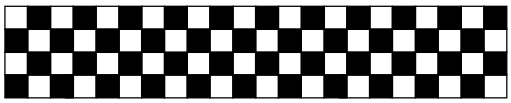
[Effective print area] [mm]

Item		Model / Method	B-850 Batch issue	B-850 Cut issue	B-850 Strip issue for auto labeler *1
Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0

“1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

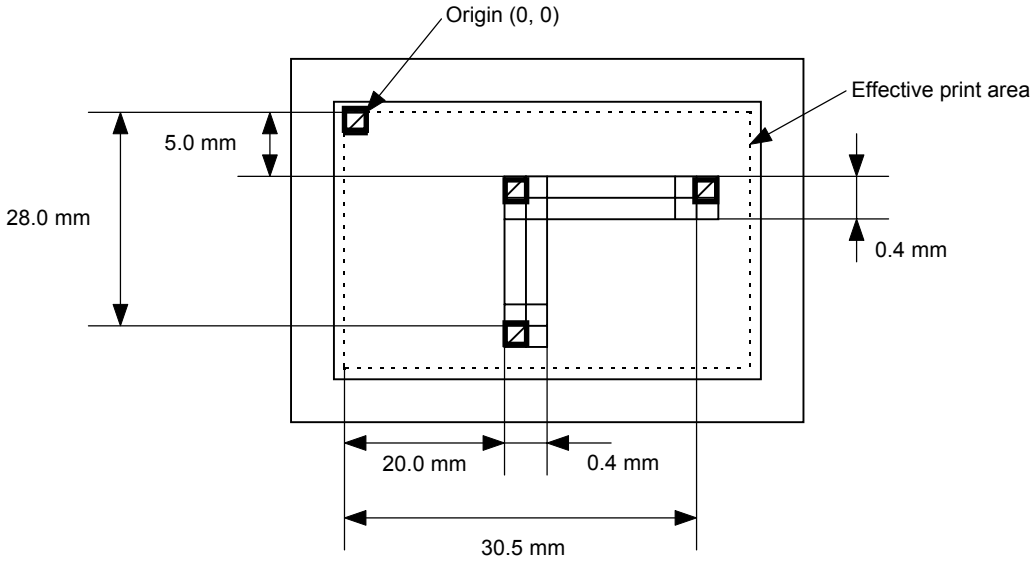
(6) The jagged line is as shown below:





(7) The slant line and the arc are not jagged.

Examples



[ESC] C [LF] [NUL]
[ESC] LC; 0200, 0350, 0305, 0050, 0, 4 [LF] [NUL]
[ESC] LC; 0200, 0050, 0200, 0280, 0, 4 [LF] [NUL]
[ESC] XS; I, 0001, 0002C4000 [LF] [NUL]

6.3.8 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

① [ESC] PCaaa; bbbb, cccc, d, e, ff (, ghh), ii, j (, JkkII) (, Mm) (, nooooooooo) (, Zpp) (, Pq) (= rrr------rrr) [LF] [NUL]

② [ESC] PCaaa; bbbb, cccc, d, e, ff (, ghh), ii, j (, JkkII) (, Mm) (, nooooooooo) (, Zpp) (, Pq) (; ss_1, ss_2, ss_3, ------, ss_{20}) [LF] [NUL]

Term

aaa: Character string number
000 to 199 (two digits, 00 to 99, also acceptable)

bbbb: Print origin of X-coordinate of character string
Fixed as 4 digits (in 0.1 mm units)

cccc: Print origin of Y-coordinate of character string
4 or 5 digits (in 0.1 mm units)

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).
The magnification can be designated in 0.1 units between 0.5 to 1. (06 ~ 09: 0.6 to 0.9 magnifications).

d d
- Designation in 0.5 magnification units : 0 or 5 (5 to 9, up to 1 magnification)
- Designation in magnifications : 0 to 9

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).
The magnification can be designated in 0.1 units between 0.5 to 1. (06 ~ 09: 0.6 to 0.9 magnifications).

e e
- Designation in 0.5 magnification units : 0 or 5 (5 to 9, up to 1 magnification)
- Designation in magnifications : 0 to 9

ff: Type of font

A:	Times Roman	(Medium)	8 point
B:	Times Roman	(Medium)	10 point
C:	Times Roman	(Bold)	10 point
D:	Times Roman	(Bold)	12 point
E:	Times Roman	(Bold)	14 point
F:	Times Roman	(Italic)	12 point
G:	Helvetica	(Medium)	6 point
H:	Helvetica	(Medium)	10 point
I:	Helvetica	(Medium)	12 point
J:	Helvetica	(Bold)	12 point
K:	Helvetica	(Bold)	14 point
L:	Helvetica	(Italic)	12 point
M:	Presentation	(Bold)	18 point
N:	Letter Gothic	(Medium)	9.5 point
O:	Prestige Elite	(Medium)	7 point

P:	Prestige Elite	(Bold)	10 point
Q:	Courier	(Medium)	10 point
R:	Courier	(Bold)	12 point
S:	OCR-A		12 point
T:	OCR-B		12 point

01 (a): Writable character 1 (1×1 dot to 720×720 dots)
to
40 (a): Writable character 40 (1×1 dot to 720×720 dots)
51 (a): 2-byte code set writable character 1 (1×1 dot to 720×720 dots)
to
55 (a): 2-byte code set writable character 5 (1×1 dot to 720×720 dots)

a: Drive
(Omissible. If omitted, flash ROM on the CPU board is selected.)
0: Flash ROM on the CPU board
1: Slot 1 on the PCMCIA board (Option)
2: Slot 2 on the PCMCIA board (Option)

* 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. If omitted, space is adjusted according to the designated font.)

g: Designates whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease

hh: No. of space dots between characters
00 to 99 (in 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: Character attribution

B: Black character

W (aabb): Reverse character (The black background is evenly solid.)

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

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

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

F (aabb): Boxed character

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

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

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

C (aa): Stroked out character

aa: No. of dots from the character string area to the end of the stroke

aa: 01 to 99 (in units of dots)

R (aabb): Reverse character
(The black background is not evenly printed in black.)

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

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

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

* Descriptions in parentheses are omissible.
(If omitted, it is character magnification (the larger one of horizontal or vertical magnifications) × 6 dots.)

Jkkll: Bold character designation
(Omissible. If omitted, this process is not performed.)

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. If omitted, the check digit is not drawn.)

m: Type of check digit
0: Modulus 10 (Draws data and check digit)
1: Modulus 43 (Draws data and check digit)
2: DBP Modulus 10 (Draws check digit only)

nooooooooooo: Increment and decrement
(Omissible. If omitted, incrementing/decrementing is not performed.)
n: Designates whether to increment or decrement.
+: Increment
-: Decrement
ooooooooooo: Skip value
0000000000 to 9999999999

Zpp: Zero suppression
(Omissible. If omitted, the zero suppression process is not performed.)
pp: No. of zeros to be suppressed
00 to 20

Pq: Alignment (Omissible. If omitted, the alignment is set to left.)
q: Designates the character position
1: Left
2: Center
3: Right
4aaaa: Equal space
aaaa: X direction of character string area
0050 to 1040 (in 0.1 mm units)
5aaaabbbcc: Automatic line feed
aaaa: X direction of character string area
0050 to 1040 (in 0.1 mm units)
bbb: Line feed length
010 to 500 (in 0.1 mm units)
cc: Number of lines
01 to 99

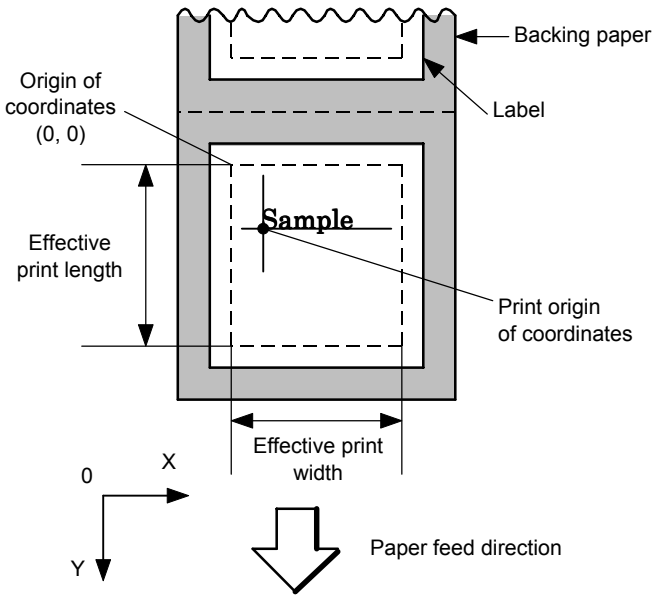
rrr------rrr: Data string to be printed (Omissible)
Max. 255 digits

ss_1, ss_2, ss_3, ------, ss_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

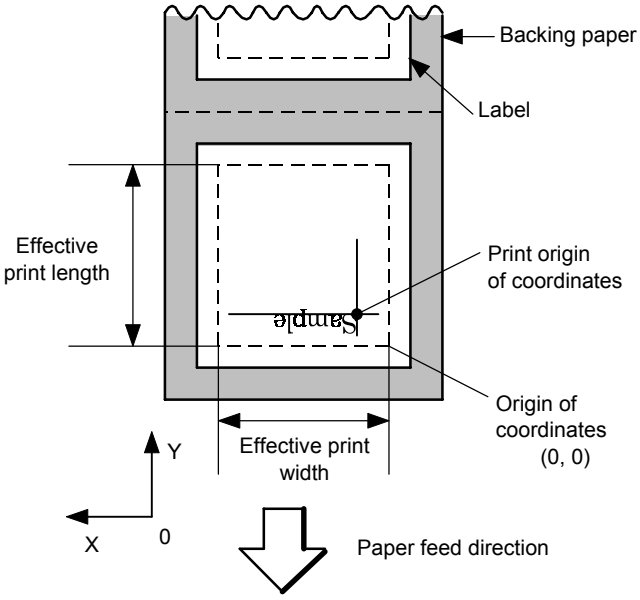
Explanation (1) Character string number

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

(2) Print origin of coordinates



[Printing direction: Printing bottom first]



[Printing direction: Printing top first]

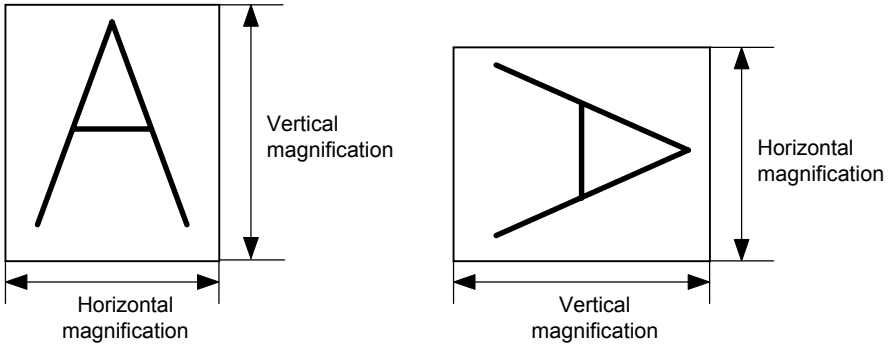
The print origin of coordinates must be set so that the result of character drawing will be within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area] [mm]

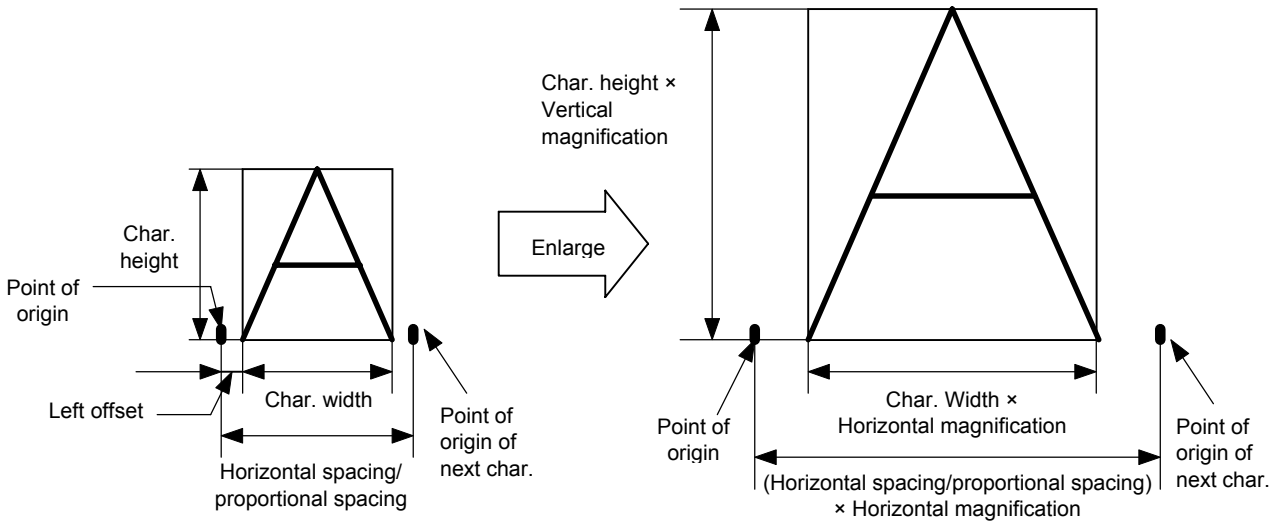
Item		Model / Method	B-850 Batch issue	B-850 Cut issue	B-850 Strip issue for auto labeler *1
Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0

"1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

(3) Horizontal magnification and vertical magnification



[Relationship between drawing coordinates and magnification]



(4) Type of font

A: Times Roman : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMabcdefghijklmÅîØÆåìÆ

B: Times Roman : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGabcdefgÅîØÆåìÆ**

C: Times Roman : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGabcdefgÅîØÆåìÆ**

D: Times Roman : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGabcdefgÅîØÆåìÆ**

E: Times Roman : **!"#$%&'()*+,-./0123456789@ABCDEFGabcdefgÅîØÆåìÆ**

F: Times Roman : *!"#$%&'()*+,-./0123456789@ABCDEFGabcdefgÅîØÆåìÆ*

G: Helvetica : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVabcdefghijklmnopqrstuvwÅîØÆåìÆ

H: Helvetica : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHabcdefghÅîØÆåìÆ

I: Helvetica : !"#$%&'()*+,-./0123456789@ABCDEFGabcdefÅîØÆåìÆ

J: Helvetica : **!"#$%&'()*+,-./0123456789@ABCDEFGabcdeÅîØÆåìÆ**

K: Helvetica : **!"#$%&0123456789@ABCDEFabcdefÅîØÆåìÆ**

L: Helvetica : *!"#$%&'()*+,-./0123456789@ABCDEFGHabcdeÅîØÆåìÆ*

M: Presentation : **!"#$%&0123456789@ABCDEFABCDE**

N: Letter Gothic : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPabcdefghijklmnopÅîØÆåìÆ

O: Prestige Elite : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPabcdefghijklmnopÅîØÆåìÆ

P: Prestige Elite : **!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFabcdefÅîØÆåìÆ**

Q: Courier : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFabcdefÅîØÆåìÆ

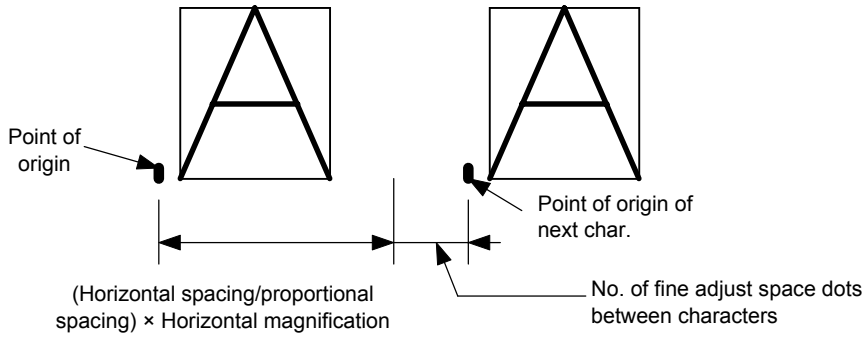
R: Courier : **!"#$%&'()*+,-./0123456789@ABCDEabcdeÅîØÆåìÆ**

S: OCR-A : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEabcdef

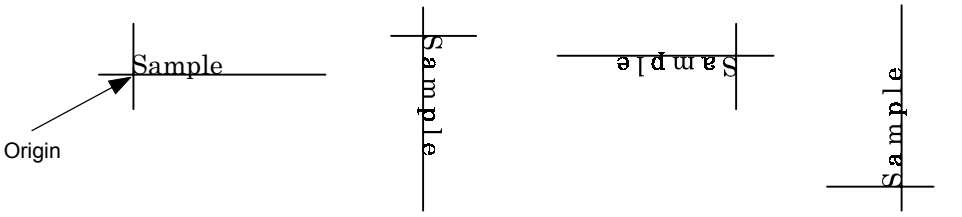
T: OCR-B : !"#$%&'()*+,-./0123456789:;<=>?@ABCDEabcdef

(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.

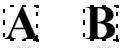


(6) Rotational angles of a character and character string

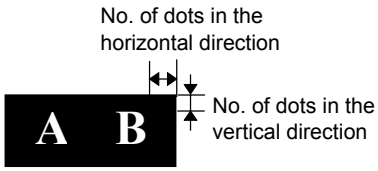


0° (00) 90° (11) 180° (22) 270° (33)

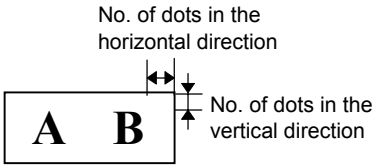
(7) Selection of character attribution



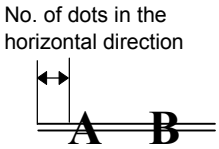
Black characters



Reverse characters

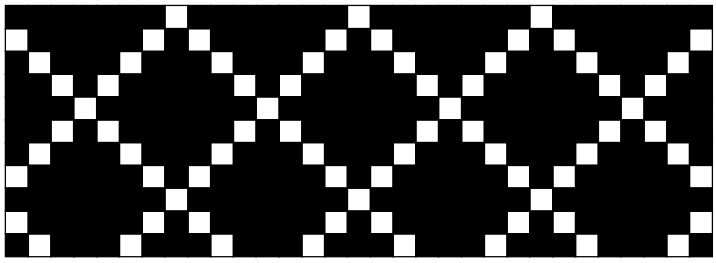


Boxed characters

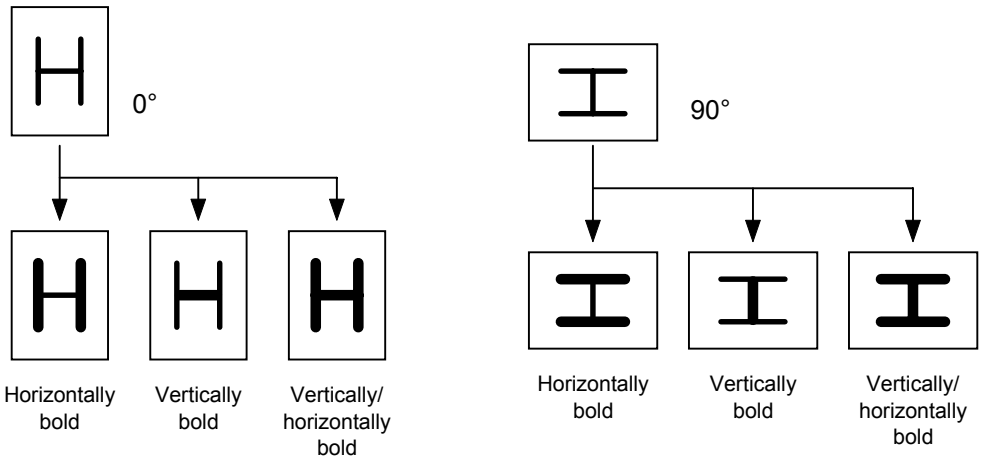


Stroked out characters

When the black background is not evenly printed in black, it is printed as shown below:



(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. However, if the data includes any data other than the numeral when the attachment of Modulus 10 is specified, drawing is not performed. Also, if the data includes any characters other than CODE39 when the attachment of Modulus 43 is specified, drawing is not performed.
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

Printing is performed while the data is incremented or decremented every time a label is issued. Where the data row exceeds the maximum number of digits (40), the data row will not be drawn. When the font type is 51, 52, 53, 54, or 55, the incrementing/decrementing cannot be designated. (If it is designated, it is ignored, and the printer operates as if there was no designation.)

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

Letters and numerals for increment/decrement

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

Example of increment/decrement calculation

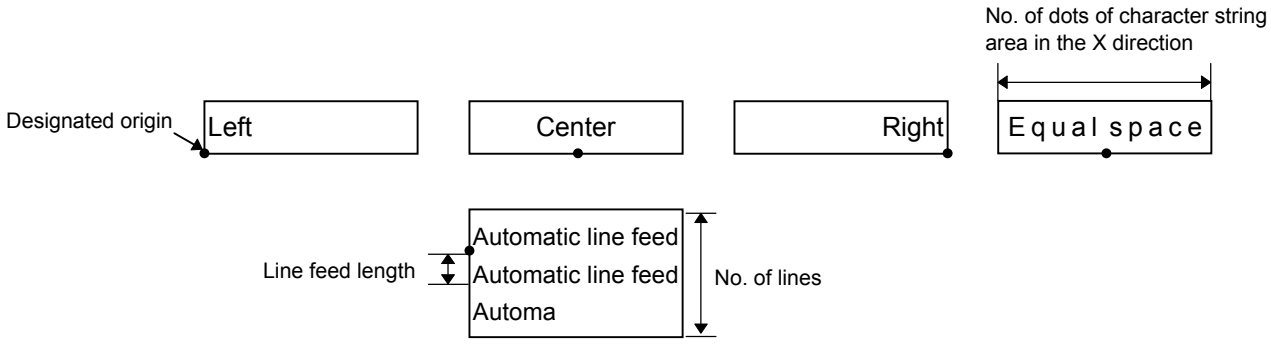
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(11) Zero suppression

No. of 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 font type is 51, 52, 53, 54 or 55, zero suppression is not designated. If it is designated, it is ignored, and the printer operates as if there was no designation.

(12) Alignment



If characters are not placed on one line when equal space and automatic line feed is designated, the following steps should be performed.

Decrease the value of the character-to-character space. When characters are not placed on one line if the value is set to “0”, return the value to its default, and then reduce the horizontal magnification for a character by 0.5.

If characters are still not placed on one line, repeatedly decrease the value of the character-to-character space, and then reduce the horizontal magnification. When characters are not placed on one line if the character magnification is set to “0.5” and the character-to-character space is set to “0”, the field is not drawn. (The same previous field is also not drawn.)

(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. If the number of digits exceeds 255, the excessive 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.

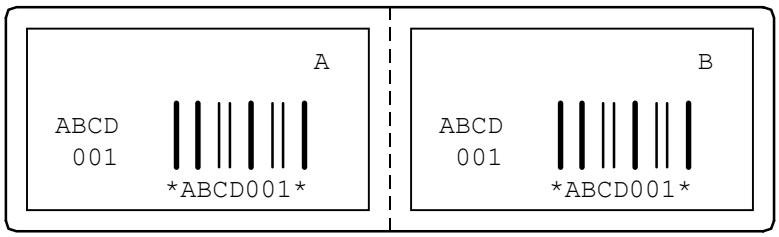
[ESC] PC04;.....	; 02 [LF] [NUL]:	Link field No. 2 is designated.
[ESC] PC05;.....	; 03 [LF] [NUL]:	Link field No. 3 is designated.
[ESC] PC06;.....	; 04 [LF] [NUL]:	Link field No. 4 is designated.
[ESC] XB02;.....	; 03, 04 [LF] [NUL]:	Link fields No. 3 and No. 4 are designated.

Designating link field No.

[Data Command]

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

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



Notes

(1) The check digit 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.

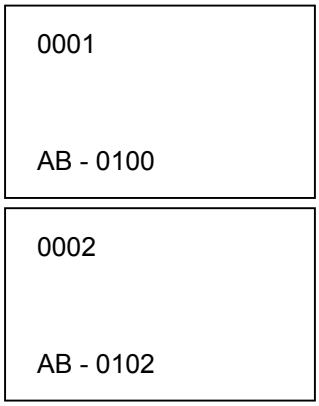
(For example, the zero(s) is replaced by a space(s) as a result of zero suppression, but the modulus 10 designated to be attached cannot be calculated.)

Increment/decrement > zero suppression > attachment of check digit

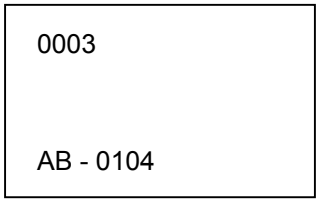
(2) Up to 32 fields for which incrementing/decrementing has been designated can be drawn. If the total of bit map font, outline font, or bar code increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented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

[Example]

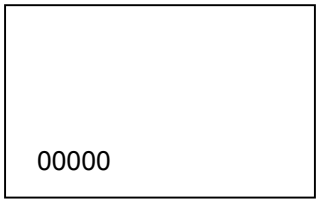
1) Format Command (Increment character string No. 001 (+1))
2) Format Command (No incrementing for character string No. 002)
3) Format Command (Increment character string No. 003 (+2))
4) Image Buffer Clear Command
5) Data Command (Character string No. 001 “0001”)
6) Data Command (Character string No.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



9) Issue Command (1 label)



10) Image Buffer Clear Command
11) Data Command (Character string No. 002 “00000”)
12) Issue Command (1 label)



(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]

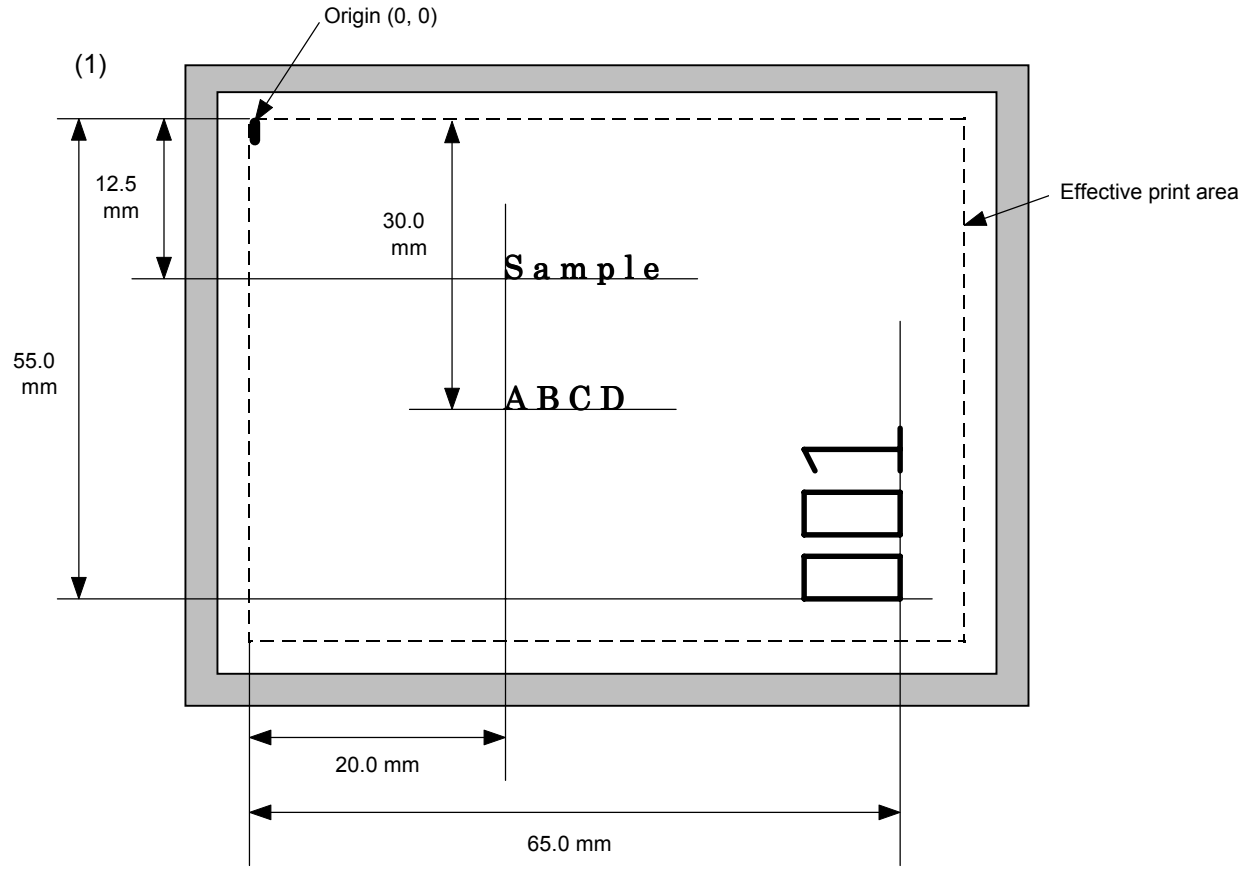
(4) When the drawing data is changed per label issue during printing, the field of the drawing data for the previous label is automatically cleared using the character string number, then the next drawing data is printed. Therefore, the character string number which differs according to the drawing fields 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 also be cleared by the Image Buffer Clear Command.

(6) A print data string and link field No. cannot be programmed at the same time.

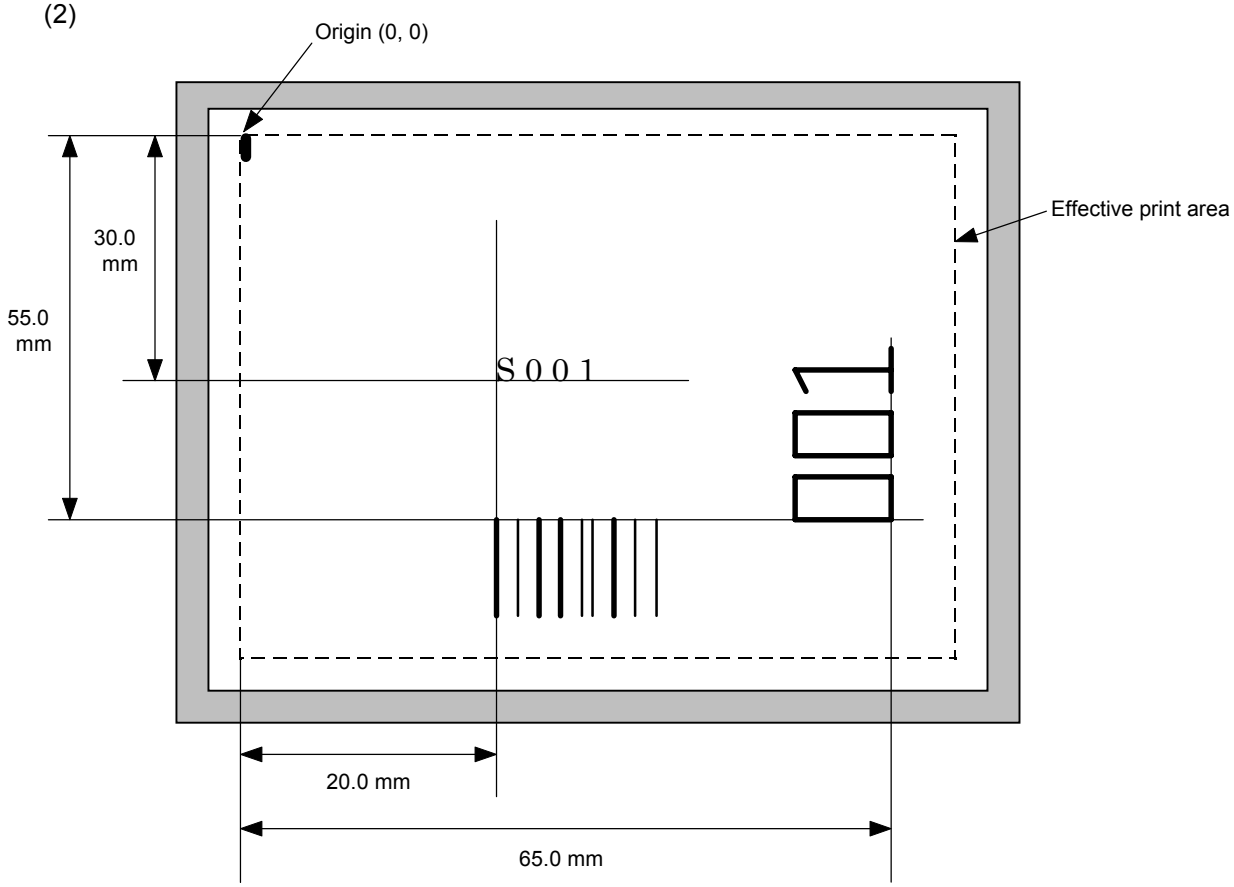
Refer to Bit Map Font Data Command ([ESC] RC)
Outline Font Format Command ([ESC] PV)
Bar Code Format Command ([ESC] XB)

Examples



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

(2)



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

6.3.9 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.

⊙ Fonts other than TrueType font

Format

① [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (= ppp------ppp) [LF] [NUL]

② [ESC] PVaa; bbbb, cccc, dddd, eeee, f (, ghhh), ii, j (, Mk) (, lmmmmmmmmmm) (, Znn) (, Po) (; qq_1, qq_2, qq_3, ------, qq_{20}) [LF] [NUL]

Term

aa: Character string number
00 to 99

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

cccc: Print origin of Y-coordinate of the character string
4 or 5 digits (in 0.1 mm units)

dddd: Character width
0020 to 0850 (in 0.1 mm units)

eeee: Height of the character
0020 to 0850 (in 0.1 mm units)

f: Type of font
A: TEC FONT1 (Helvetica [bold])
B: TEC FONT1 (Helvetica [bold] proportional)
E: Price Font 1
F: Price Font 2
G: Price Font 3
H: TEC FONT2 DUTCH801 Bold (Times Roman Proportional)
I: TEC FONT3 BRUSH738 Regular (Pop Proportional)

ghhh: Fine adjustment of character-to-character space
(Omissible. If omitted, space is adjusted according to the designated font.)
g: Designates whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease
hhh: No. of space dots between characters
000 to 512 (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: Character attribution

B: Black character

W (aabb): Reverse character (The black background is evenly solid.)

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

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

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

F (aabb): Boxed character

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

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

aa: 01 to 99 (in units of dots)
bb: 01 to 99 (in units of dots)

C (aa): Stroked out character

aa: No. of dots from the character string area to the end of the stroke

aa: 01 to 99 (in units of dots)

R (aabb): Reverse character
(The black background is not evenly printed in black.)

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

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

aa:01 to 99 (in units of dots)
bb:01 to 99 (in units of dots)

* Descriptions in parentheses are omissible.
(If omitted, it is character size (the larger character width or height) ÷ 8 dots.)

Mk: Type of the check digit to be attached
(Omissible. If omitted, the check digit is not drawn.)

k: Type of check digit

0: Modulus 10 (Draws data and check digit)
1: Modulus 43 (Draws data and check digit)
2: DBP Modulus 10 (Draws check digit only)

lmmmmmmmmmm: Increment and decrement
(Omissible. If omitted, incrementing/decrementing is not performed.)

l: Designates whether to increment or decrement.

+: Increment
-: Decrement

mmmmmmmmmm: Skip value
0000000000 to 9999999999

Znn: Zero suppression
(Omissible. If omitted, the zero suppression process is not performed.)
nn: No. of zeros to be suppressed
00 to 20

Po: Alignment (Omissible. If omitted, the alignment is set to left.)
o: Designates the character position.
1: Left
2: Center
3: Right
4aaaa: Equal space
aaaa: X direction of character string area
0050 to 1040 (in 0.1 mm units)

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

qq_1, qq_2, qq_3, ------, qq_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

⊙ TrueType font

Format [ESC] PVaa; bbbb, cccc, dddd, eeee, ff, g (, hiii), jj, k (= ppp ------ ppp) [LF] [NUL]

Term

aa: Character string number
00 to 99

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

cccc: Print origin of Y-coordinate of the character string
4 or 5 digits (in 0.1 mm units)

dddd: Character width
0020 to 0850 (in 0.1 mm units)

eeee: Height of the character
0020 to 0850 (in 0.1 mm units)

ff: Type of font
01: BalloonPExtBol (File name: Ballp_eb.ttf)
02: BlacklightD (File name: Blklt_rg.ttf)
03: BrushScrD (File name: Brush_rg.ttf)
04: CG Times (File name: Tec_cgt.ttf)
05: CG Times Bold (File name: Tec_cgtb.ttf)
06: CG Times Italic (File name: Tec_cgti.ttf)
07: Clarendon Condensed Bold (File name: Tec_clcd.ttf)
08: FlashPBol (File name: Flash_bd.ttf)
09: Garamond Kursiv Halbfett (File name: Tec_gmkh.ttf)
10: GoudyHeaP (File name: Gdyhp_rg.ttf)
11: GilliesGotDBol (File name: Gilli_bd.ttf)
12: GilliesGotLig (File name: Gilli_lt.ttf)
13: NimbusSanNovTUltLigCon (File name: Nsnct_ul.ttf)
14: Ryahd (File name: ryahd.ttf)
15: Ryahd Bold (File name: ryahdbd.ttf)
16: CG Triumvirate (File name: Trium.ttf)
17: CG Triumvirate Condensed Bold (File name: Triumcb.ttf)
18: Univers Medium (File name: Tec_uni.ttf)
19: Univers Bold (File name: Tec_unib.ttf)
20: Univers Medium Italic (File name: Tec_unii.ttf)
21: add_on TrueType Font 1 (File name: addttf01.ttf)
22: add_on TrueType Font 2 (File name: addttf02.ttf)
23: add_on TrueType Font 3 (File name: addttf03.ttf)
24: add_on TrueType Font 4 (File name: addttf04.ttf)
25: add_on TrueType Font 5 (File name: addttf05.ttf)

(*1) The font types 21 to 25 are the fonts that a user adds. These fonts can be used by specifying “addttf01.ttf” to “addttf05.ttf” for the file names and installing these in the ATA card.

(*2) For the fonts stored in flash ROM on the CPU board, parameter “ff” for the type of font corresponds to the font type according to the setting made when fonts are stored.

g: Drive

Indicates where the TrueType font files are stored.

0: Flash ROM on the CPU board
1: Slot 1 on the PCMCIA board (Option)
2: Slot 2 on the PCMCIA board (Option)

* “0” cannot be specified for the font types from 21 to 25.

hiiii: Fine adjustment of character-to-character space
(Omissible. If omitted, space is adjusted according to the designated font.)

h: Designates whether to increase or decrease the character-to-character space.
+: Increase
-: Decrease

iii: No. of space dots between characters
000 to 512 (in dots)

jj: Rotational angles of a character and character string

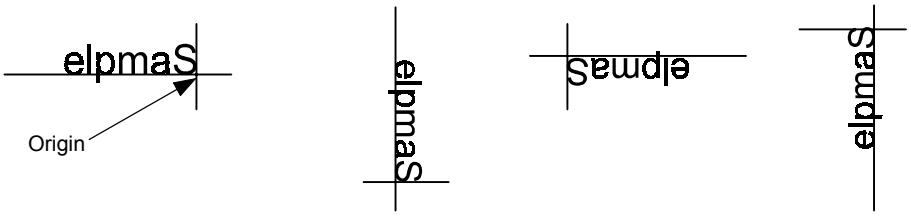
00:	0° (char.)	0° (char.-string)
11:	90° (char.)	90° (char.-string)
22:	180° (char.)	180° (char.-string)
33:	270° (char.)	270° (char.-string)

k: Character attribution
B: Black character

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

* TrueType fonts are not included in the standard character generator data. Therefore, they must be installed in flash ROM on the CPU board, or the ATA card. For installation of TrueType font and details, refer to the TrueType Font Specification (TAA-1184).

* If “Arabic” is selected as the character code in the parameter setting in the system mode, letters are written from right to left.

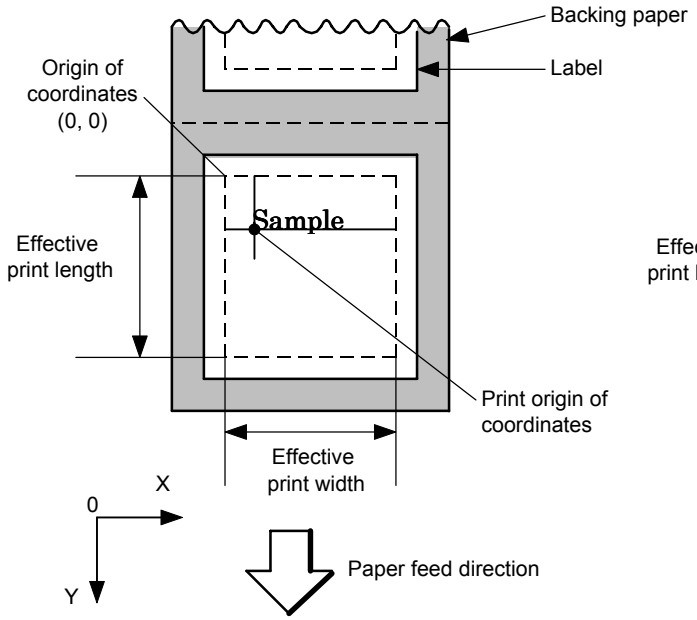


0° (00) 90° (11) 180° (22) 270° (33)

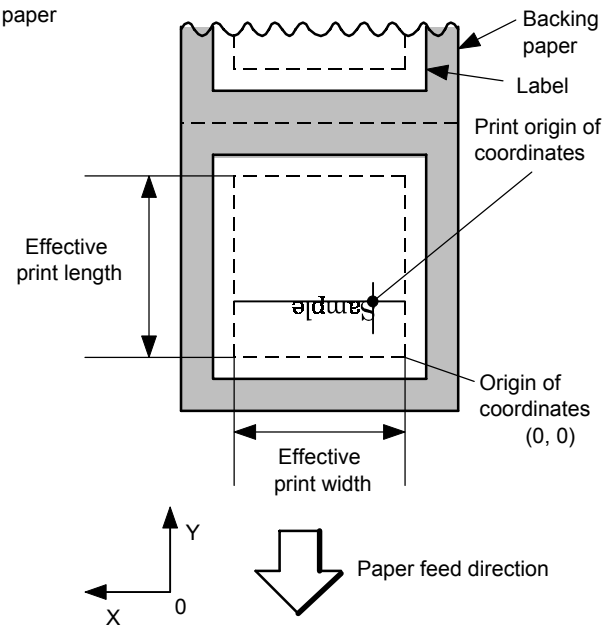
Explanation (1) Character string number

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

(2) Print origin of coordinates



[Print direction: Printing bottom first]



[Print direction: Printing top first]

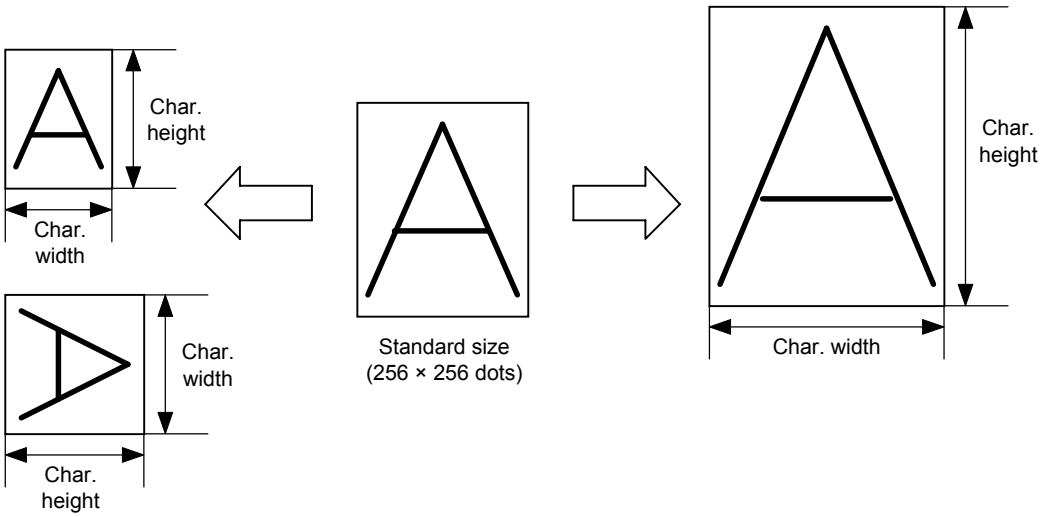
• The print origin of coordinates must be set so that the result of character drawing will be within the effective print area set by the Label Size Set Command ([ESC] D).

[Effective print area] [mm]

Item		Model / Method	B-850 Batch issue	B-850 Cut issue	B-850 Strip issue for auto labeler *1
Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0

"1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

(3) Character width and character height



(4) Type of font

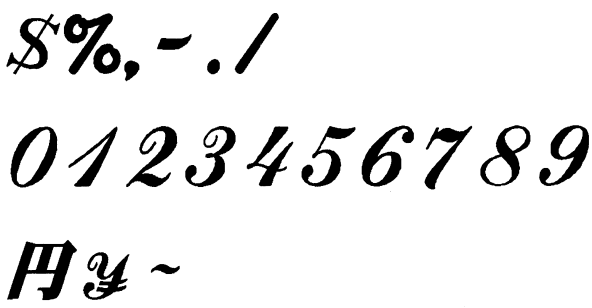
A: TEC FONT1 (Helvetica [bold])

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

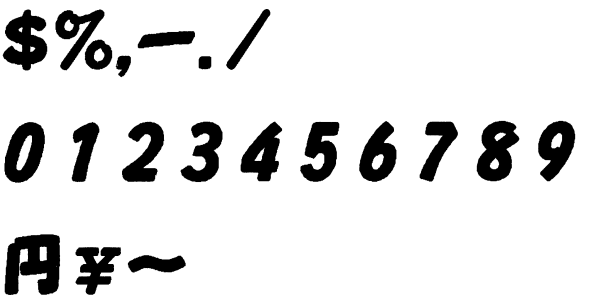
B: TEC FONT1 (Helvetica [bold] proportional)

```
 !”#$%&’()*+,−./
0123456789:;<=>?
@ABCDEFGHIJKLMNO
‘abcdefghijklmno
Çüéâäàåçêëèïîì Ä Å
```

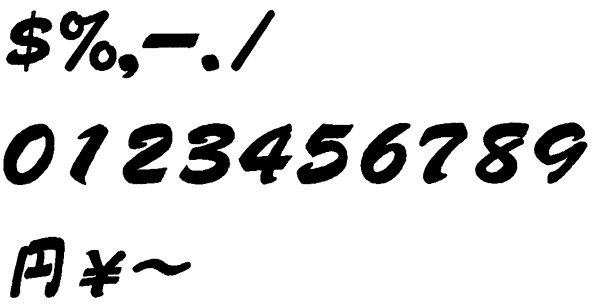
E: Price font 1 (POP font)



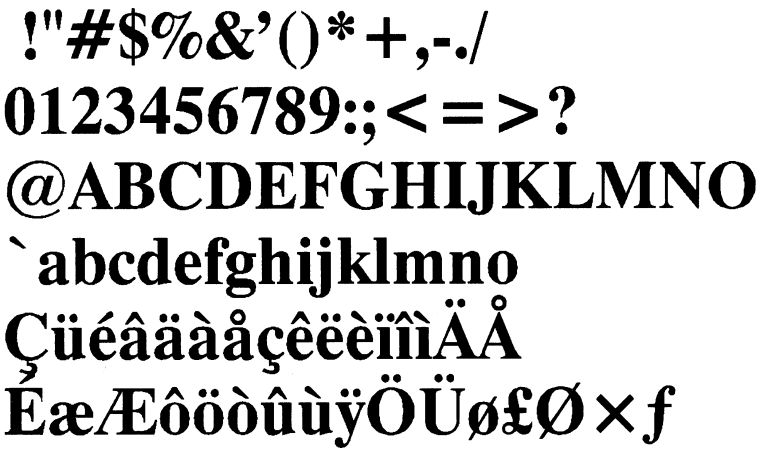
F: Price font 2 (POP font)



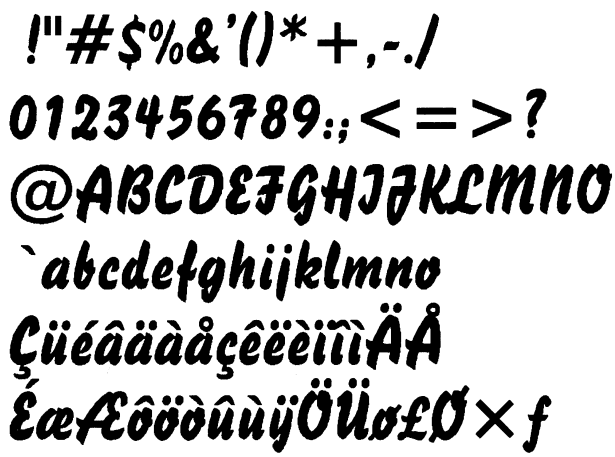
G: Price font 3 (POP font)



H: TEC FONT 2 DUTCH801 Bold (Times Roman Proportional)

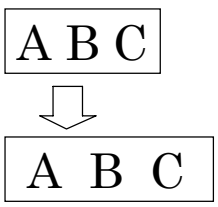


I: TEC FONT 3 BRUSH 738 Regular (Pop Proportional)

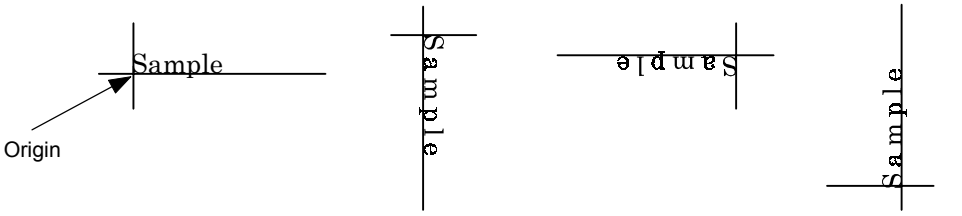


(5) Fine adjustment of character-to-character space

If no character-to-character space is specified or the number of space dots between characters is “0”, drawing will take place according to the horizontal spacing/proportional spacing determined for each character. If character-to-character space is specified, drawing will take place according to the value obtained by adding the character spacing/proportional spacing to the specified value. When equal space is selected for the alignment, the character-to-character space setting is invalid. (The horizontal spacing/proportional spacing are increased or decreased depending on the character size.)

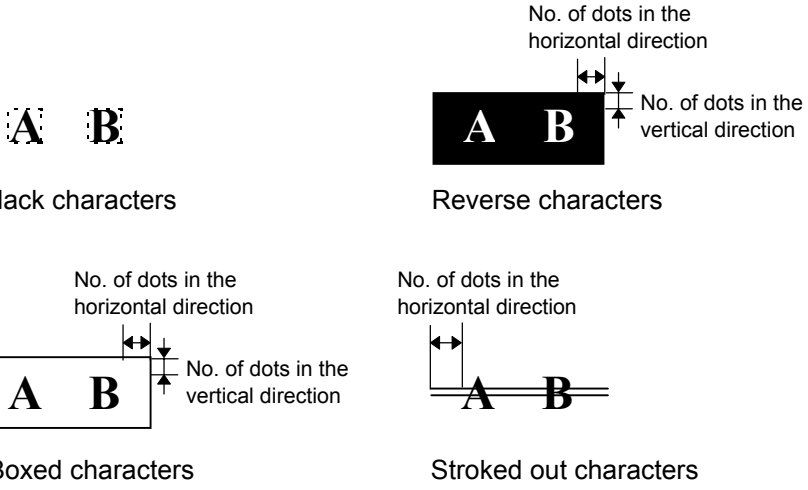


(6) Rotational angles of a character and character string



0° (00) 90° (11) 180° (22) 270° (33)

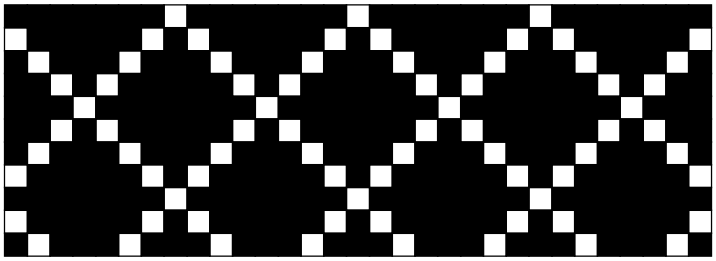
(7) Selection of character attribution



Black characters Reverse characters

Boxed characters Stroked out characters

When the black background is not evenly printed in black, it is printed as shown below:



(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

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

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

Letters and numerals for increment/decrement

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

Example of increment/decrement calculation

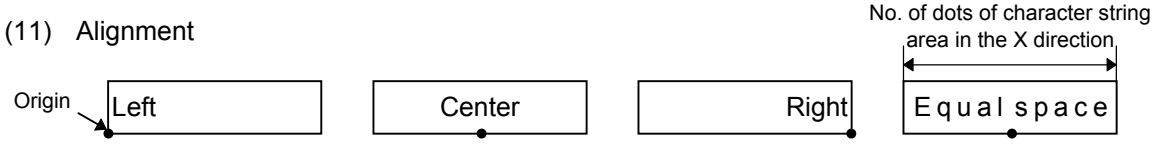
Initial value	00000	A0A0A	7A8/9	A2A0A
INC/DEC	+1	+1	+3	-3
1st label	00000	A0A0A	7A8/9	A2A0A
2nd label	00001	A0A1A	7A9/2	A1A7A
3rd label	00002	A0A2A	7A9/5	A1A4A
4th label	00003	A0A3A	7A9/8	A1A1A
5th label	00004	A0A4A	8A0/1	A0A8A

(10) Zero suppression

No. of 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



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

(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, the excessive 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]

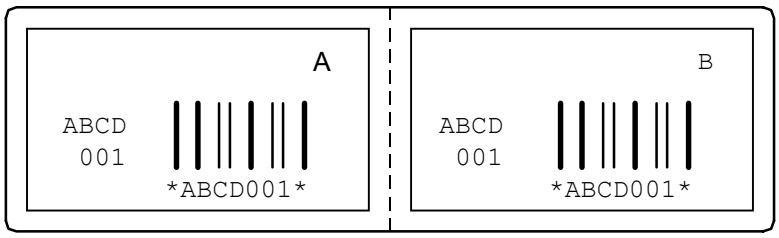
[ESC] PV01;.....	; 01 [LF] [NUL]:	Link field No. 1 is designated.
[ESC] PV02;.....	; 03 [LF] [NUL]:	Link field No. 3 is designated.
[ESC] PV03;.....	; 04 [LF] [NUL]:	Link field No. 4 is designated.
[ESC] XB01;.....	; 03, 04 [LF] [NUL]:	Link fields No. 3 and No. 4 are designated.
[ESC] PV04;.....	; 02 [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. 4
Link field No. 3
Link field No. 2
Link field No. 1



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.

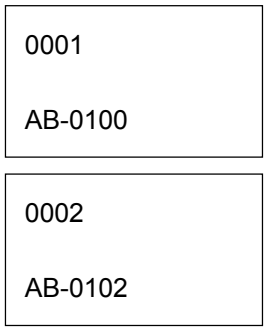
(For example, the zero(s) is replaced by a space(s) as a result of zero suppression but the modulus 10 designated to be attached cannot be calculated.)

Increment/decrement > zero suppression > attachment of check digit

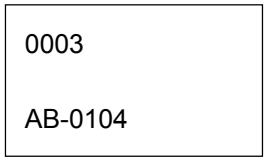
(2) Up to 32 fields for which incrementing/decrementing has been designated can be drawn. If the total of bit map font, outline font, or bar code increment/decrement fields exceeds 32, drawing will take place without incrementing/decrementing any excessive field. The field to be incremented or decremented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

[Examples]

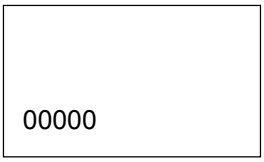
1) Format Command (Increment character string No. 001 (+1))
2) Format Command (No incrementing for character No. 002)
3) Format Command (Increment character string No. 003 (+2))
4) Image Buffer Clear Command
5) Data Command (Character string No. 001 “0001”)
6) Data Command (Character string No. 002 “AB-”)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



9) Issue Command (1 label)



10) Image Buffer Clear Command
11) Data Command (Character string No. 002 “00000”)
12) Issue Command (1 label)



(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.)

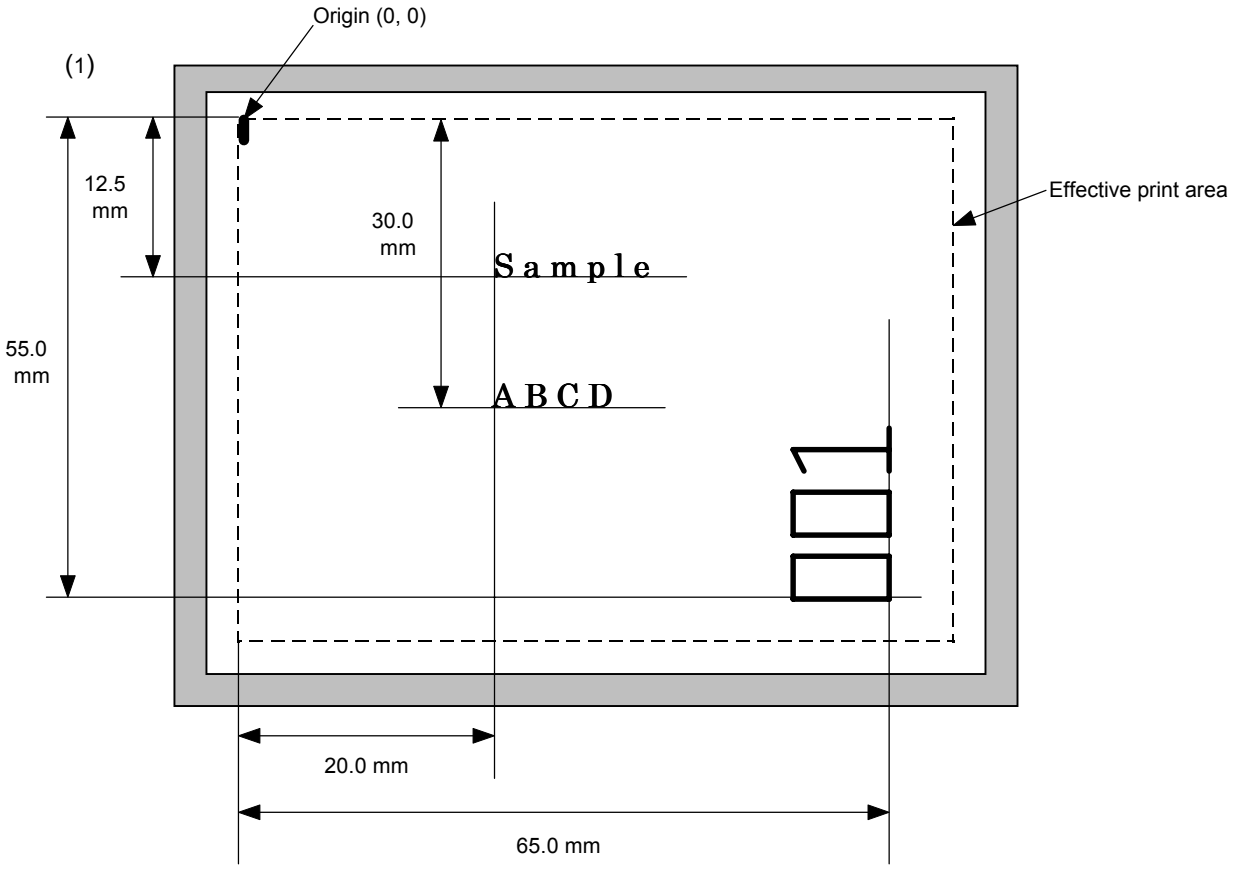
(5) When characters overlap due to the character-to-character space fine adjustment, the outline font is not painted properly. Program the fine adjust value so that characters will not overlap. Also, when drawings such as lines or characters are on the outline font drawing position, the outline font is not painted properly. For font types A and B, the fine adjustment value should be set so that other drawings do not overlap the area in which the outline font is to be drawn. For font types C, E, F and G, the fine adjustment value should be set so that other drawings do not overlap the area for the designated character width and height.

(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 also be cleared by the Image Buffer Clear Command.

(7) A print data string and link field No. cannot be programmed at the same time.

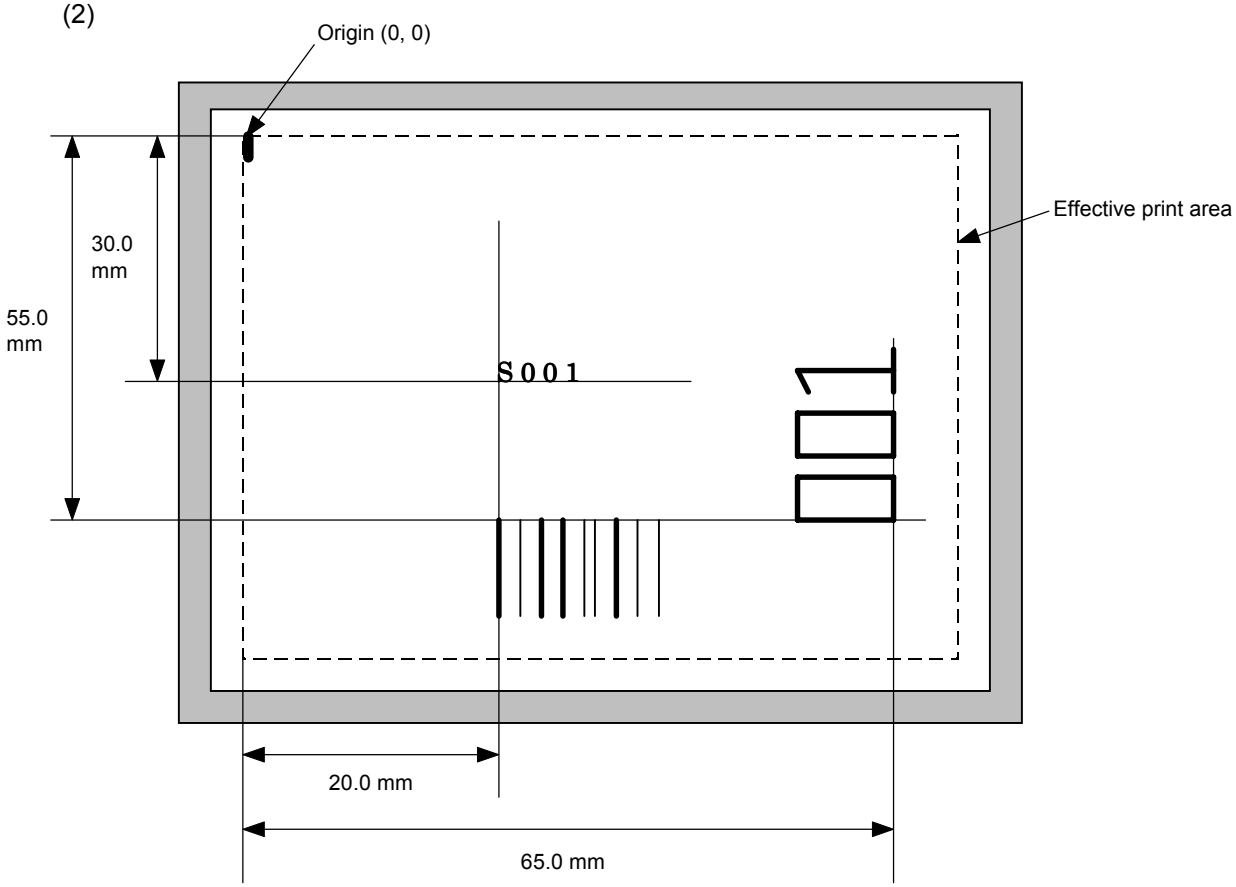
Refer to Outline Font Data Command ([ESC] RV)
Bit Map Font Format Command ([ESC] PC)
Bar Code Format Command ([ESC] XB)

Examples



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

(2)



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

6.3.10 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, Customer bar code, POSTNET, RM4SCC, KIX CODE
(WPC is the generic name for bar codes of JAN, EAN and UPC.)

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
4 or 5 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 (Postal code for Japan)
- S: Highest priority customer bar code (Postal code for Japan)
- U: POSTNET (Postal code for U.S)
- V: RM4SCC (ROYAL MAIL 4 STATE CUSTOMER CODE) (Postal code for U.K)
- W: KIX CODE (Postal code for Belgium)

e: Type of check digit

1: Without attaching check digit

2: Check digit check

WPC	Modulus 10
CODE93	Modulus 47
CODE128	PSEUDO 103

3: Check digit auto attachment (1)

WPC	Modulus 10
CODE93	Modulus 47
CODE128	PSEUDO 103
UCC/EAN128	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

* For the Customer bar code, POSTNET, and RM4SCC, only “3: Check digit auto attachment (1)” is effective.

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)

For the Customer bar code, POSTNET, RM4SCC, KIX CODE, the height of the long bar is specified.

mnnnnnnnnnn: Increment/decrement

(Omissible. If omitted, incrementing/decrementing is not performed.)

m: Indicates whether to increment or decrement

+: Increment
-: Decrement

nnnnnnnnnn: Skip value

0000000000 to 9999999999

ooo: Length of WPC guard bar

(Omissible. If omitted, the guard bar is not attached.)

000 to 100 (in 0.1 mm units)

p: Selection of print or non-print of numerals under bars

(Omissible. If omitted, the numerals under the bars are not printed.)

0: Non-print
1: Print

qq: No. of zeros to be suppressed
(Omissible. If omitted, the zero suppression process is not performed.)
00 to 20

sss ------ sss: Data string to be printed (Omissible)
Max. 126 digits. However, it varies depending on the type of bar code.

tt_1, tt_2, tt_3, ------. tt_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 fields can be designated using commas.

* Omissible parameters in parentheses (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 (Customer bar code, POSTNET, RM4SCC, or KIX CODE) is selected.

⊙ 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
4 or 5 digits (in 0.1 mm units)

d: Type of bar code
1: MSI
2: Interleaved 2 of 5 (ITF)
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 as “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 fixed as “00”.

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)

mnnnnnnnnnn: Increment/decrement
(Omissible. If omitted, incrementing/decrementing is not performed.)

m: Indicates whether to increment or decrement
+: Increment
- : Decrement

nnnnnnnnnn: Skip value
0000000000 to 9999999999

p: Selection of print or non-print of numerals under bars
(Omissible. If omitted, the numerals under the bars are not printed.)
0: Non-print
1: Print

qq: No. of zeros to be suppressed
(Omissible. If omitted, the zero suppression process is not performed.)
00 to 20

r: Designates the attachment of start/stop code
(Omissible. If omitted, the start/stop code is automatically attached.)
T: Attachment of start code only
P: Attachment of stop code only
N: Start/stop code unattached

sss------sss: Data string to be printed (Omissible)
Max. 126 digits. However, the number of digits varies depending on the type of bar code.

tt_1, tt_2, tt_3, ------, tt_{20}: 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 Data Matrix (Two-dimensional code)

Format

① [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijjj) (, Jkkllmmmnnn) (= ooo ------ooo) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h (, Ciiijjj) (, Jkkllmmmnnn) (= pp_1, pp_2, pp_3, ------, pp_{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
4 or 5 digits (in 0.1 mm units)

d: Type of bar code
Q: Data Matrix (Two-dimensional code)

ee: ECC type
00: ECC0
01: ECC50
04: ECC50
05: ECC50
06: ECC80
07: ECC80
08: ECC80
09: ECC100
10: ECC100
11: ECC140
12: ECC140
13: ECC140
14: ECC140
20: ECC200

ff: 1-cell width
00 to 99 (in dots)

gg: Format ID
01: Format ID 1
02: Format ID 2
03: Format ID 3
04: Format ID 4
05: Format ID 5
06: Format ID 6

* When ECC200 is designated as ECC type, the format ID designation is ignored. When format ID of 11 through 16 is designated, the selection of ECC200 is compulsory (to ensure compatibility with the old model).

h: Rotational angle of bar code

0: 0°
1: 90°
2: 180°
3: 270°

Ciiijjj: No. of cells

(Omissible. If omitted, it is automatically set.)

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

* Cell setting varies according to the ECC type.

	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 any data other than the above values is designated for the number of cells in the X and Y directions, the number of cells is automatically set.

Jkkllmmmnnn: Connection setting

(Omissible. No connection if this parameter is omitted.)

kk: Code number 01 to 16
ll: No. of divided codes 02 to 16
mmm: ID number 1 001 to 254
nnn: ID number 2 001 to 254

ooo ------ ooo: Data string to be printed (Omissible)

Max. 2000 digits.

pp_1, pp_2, pp_3, ------, pp_{20}: 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, iiii (= jjj------jjj) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiii (; 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
4 or 5 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 also be 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, iiii (= jjj------jjj) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, ee, ff, gg, h, iiii (; 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
4 or 5 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°

iiii: 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 number of columns and rows for the MicroPDF417

Parameter (gg)	No. of columns	No. of rows	Max. number of digits for binary mode	Max. number of digits for upper case letter/space mode	Max. number of digits for numeric mode
00	–	–	150	250	366
01	1	–	22	38	55
02	2	–	43	72	105
03	3	–	97	162	237
04	4	–	150	250	366
05	1	11	3	6	8
06		14	7	12	17
07		17	10	18	26
08		20	13	22	32
09		24	18	30	44
10		28	22	38	55
11	2	8	8	14	20
12		11	14	24	35
13		14	21	36	52
14		17	27	46	67
15		20	33	56	82
16		23	38	64	93
17		26	43	72	105
18	3	6	6	10	14
19		8	10	18	26
20		10	15	26	38
21		12	20	34	49
22		15	27	46	67
23		20	39	66	96
24		26	54	90	132
25		32	68	114	167
26		38	82	138	202
27		44	97	162	237
28	4	4	8	14	20
29		6	13	22	32
30		8	20	34	49
31		10	27	46	67
32		12	34	58	85
33		15	45	76	111
34		20	63	106	155
35		26	85	142	208
36		32	106	178	261
37		38	128	214	313
38		44	150	250	366

"–" 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 are equal, the pattern which has a smaller number of columns is selected.

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

Format

① [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkkllmm) (= nnn --- nnn) [LF] [NUL]

② [ESC] XBaa; bbbb, cccc, d, e, ff, g, h (, Mi) (, Kj) (, Jkkllmm) (= oo_1, oo_2, oo_3 ------ oo_{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
4 or 5 digits (in 0.1 mm units)

d: Type of bar code
T: QR code (Two-dimensional code)

e: Designation of error correction level
L: High density level
M: Standard level
Q: Reliability level
H: High reliability level

ff: 1-cell width
00 to 52 (in dots)

g: Selection of mode
M: Manual mode
A: Automatic mode

h: Rotational angle of the bar code
0: 0°
1: 90°
2: 180°
3: 270°

Mi: Selection of model
(Omissible. If omitted, Model 1 is automatically selected.)
i = 1: Model 1
2: Model 2

Kj: Mask number
(Omissible. If omitted, the number is automatically set.)
j = 0 to 7: Mask number 0 to 7
8: No mask

Jkkllmm: Connection setting
(Omissible. No connection if 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: A value for all data to be printed, to which XOR is applied in units of bytes (Not divided)

nnn --- nnn: Data string to be printed (Omissible)
Max. 2000 digits

oo_1 --- oo_{20}: Link field No. (Omissible)
01 to 99 (1 to 99 can also be used.)
Up to 20 digits can be designated using commas.

⊙ 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
4 or 5 digits (in 0.1 mm units)

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

e: Mode selection (Omissible)
Omitted: Mode 2
0: Mode 2
1: Mode 4
2: Mode 2
3: Mode 3
4: Mode 4
5: Mode 2
6: Mode 6
7: Mode 2
8: Mode 2
9: Mode 2

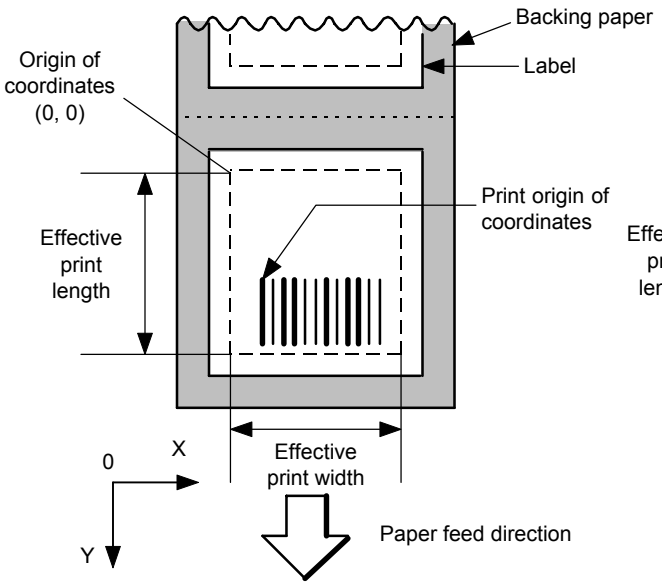
Jffgg: Connection setting (Omissible. No connection if this parameter is omitted.)
ff: Code number 01 to 08
gg: No. of divided codes 01 to 08

Zh: Attachment of Zipper block and Contrast block
(Omissible. If omitted, they are not attached.)
h= 0: No attachment of Zipper block and Contrast block
1: Attachment of Zipper block and Contrast block
2: Attachment of Zipper block
3: Attachment of Contrast block

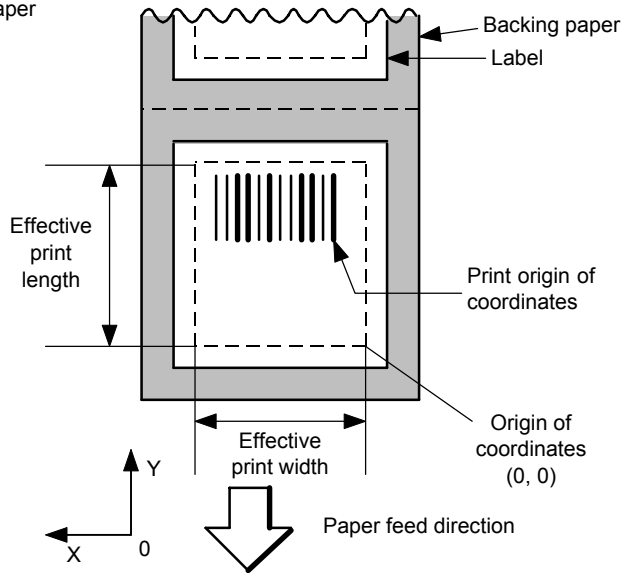
Explanation (1) Bar code number

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

(2) Print origin of coordinates



[Print direction: Printing bottom first]



[Print direction: Printing top first]

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 / Method	B-850 Batch issue	B-850 Cut issue	B-850 Strip issue for auto labeler *1
Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0

"1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

(3) Type of bar code

0: JAN8, EAN8



1: MSI



2: Interleaved 2 of 5



3: CODE39 (standard)



4: NW7



5: JAN13, EAN13



6: UPC-E



7: EAN13 + 2 digits



8: EAN13 +5 digits



9, A: CODE128



B: CODE39 (Full ASCII)



C: CODE93



G: UPC-E + 2 digits



H: UPC-E + 5 digits



I: EAN8 + 2 digits



J: EAN8 + 5 digits



K: UPC-A



L: UPC-A + 2 digits



M: UPC-A + 5 digits



N: UCC/EAN128



O: Industrial 2 of 5



P: PDF417



Q: Data Matrix



R: Customer bar code



S: Highest priority customer bar code



T: QR code



U: POSTNET



V: RM4SCC



W: KIX code



X: MicroPDF417



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 proper value to be designated differs according to the rotational angle of bar code, type, number of digits, print speed, paper used, etc. Examples of such designations are listed below. (1 dot = 1/12 mm)

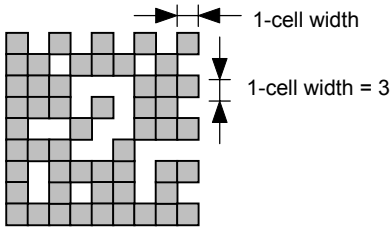
In the case of JAN, EAN, UPC, CODE93, CODE128, UCC/EAN128, PDF417, or MicroPDF417, a 2 to 6-module width is automatically calculated when a 1-module width is designated.

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	4		8		12		16		-		-	
CODE93	3		6		9		12		-		-	
CODE128, EAN128	3		6		9		12		-		-	
PDF417	3		6		9		12		15		18	
MicroPDF417	2		4		6		8		10		12	

Type of bar code	Narrow		Wide		Character-to-character space
	Bar	Space	Bar	Space	
MSI	3	3	8	8	0
ITF	3	3	8	8	0
CODE39	3	3	8	8	3
NW7	3	3	8	8	3
Industrial 2 of 5	3	3	8	0	3

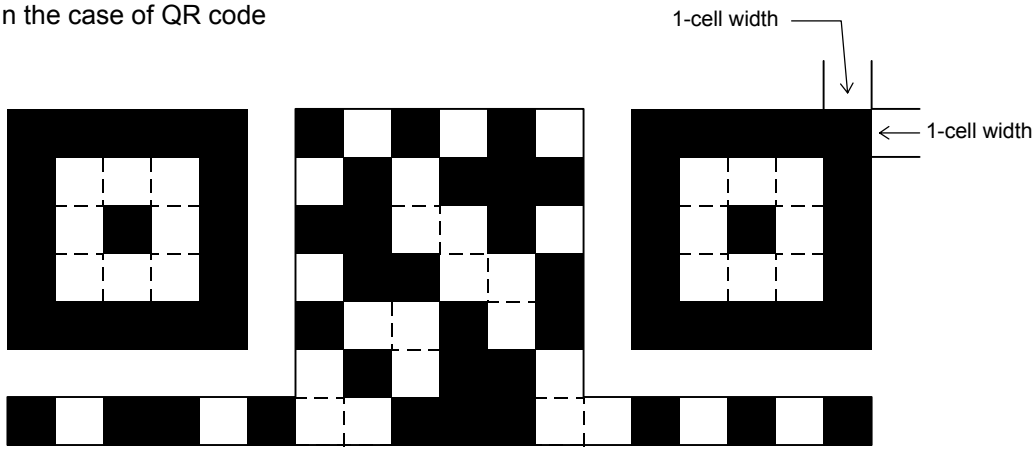
When NW7 is used, transmission of the space character assumes the space of (narrow space width × 12) dots. In this case, the space is max. 255 dots.

In the case of Data Matrix



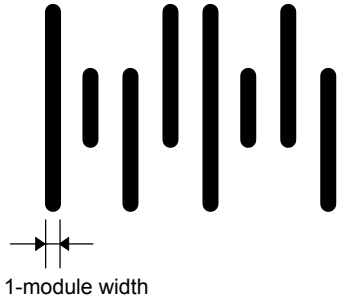
When 1-cell width is “00” for the Data Matrix, a two-dimensional code is not drawn. However, the two-dimensional code printed on the previous label is cleared.

In the case of QR code

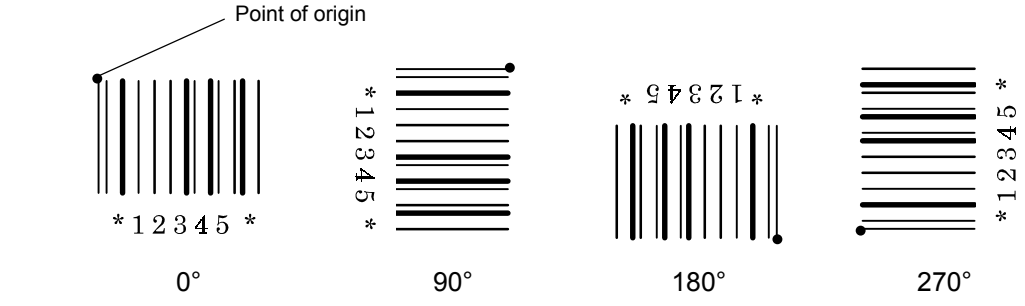


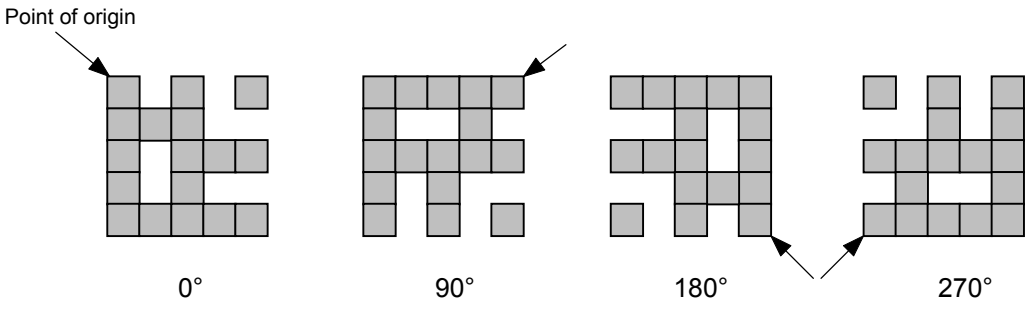
When the 1-cell width is “0”, a two-dimensional code is not drawn. However, the bar code printed on the previous label is cleared.

In the case of a postal code

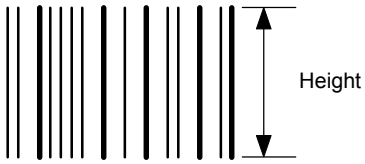


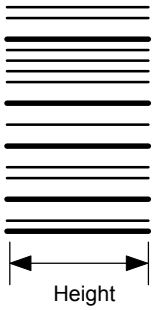
(6) Rotational angle of bar code





(7) Bar code height



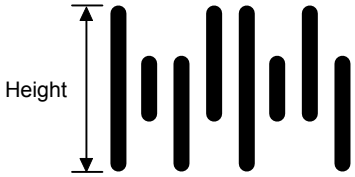


[PDF417, MicroPDF417]





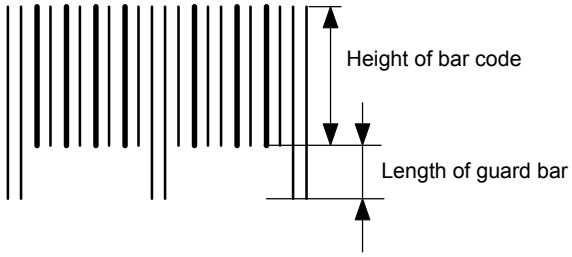
[Postal code]



When the bar code height is “0000”, bar code (including guard bars) 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.

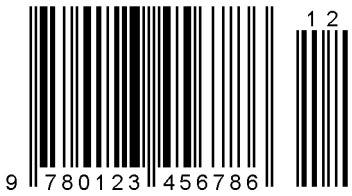


(9) Numerals under bars

Numerals are/are not 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. 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



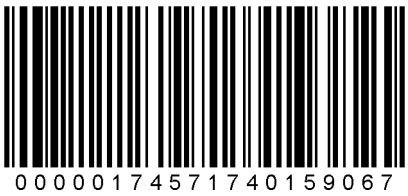
(Example) UPC-E



③ In the case of bar codes 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 described later in this specification.

(11) Increment/decrement

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

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

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

Letters and numerals for increment/decrement

For CODE39 (standard), CODE39 (full ASCII), NW7, CODE93, and CODE128, if a data string other than numerals is included in the data, increment/decrement is performed. However, if any code which does not exist in each bar code table is contained in the data, increment/decrement is not performed.

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

Example of increment/decrement calculation

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

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, 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.

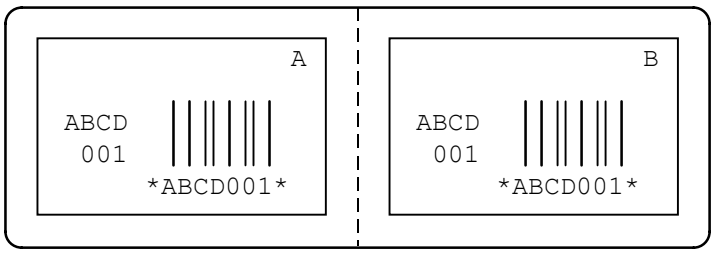
[ESC] PC04;.....	; 02 [LF] [NUL]:	Link field No. 2 is designated.
[ESC] PC05;.....	; 03 [LF] [NUL]:	Link field No. 3 is designated.
[ESC] PC06;.....	; 04 [LF] [NUL]:	Link field No. 4 is designated.
[ESC] XB02;.....	; 03, 04 [LF] [NUL]:	Link fields No. 3 and No. 4 are designated.

Designating link field No.

[Data Command]

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

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



(15) Explanation for Data Matrix

① ECC type

Data Matrix contains a function to correct a code reading error using an error correcting code (ECC) and restore normal data. Since there are several ECCs, ECC should be designated according to usage. The general correction ability is as shown below. However, it may vary according to the error conditions.

ECC type	Error Correction Ability	Overhead by ECC
ECC0	Low ↕ High	0%
ECC50		25%
ECC80		33%
ECC100		50%
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)

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.

	ECC0	ECC50	ECC80	ECC100	ECC140
Format ID 1	500	457	402	300	144
Format ID 2	452	333	293	218	105
Format ID 3	394	291	256	190	91
Format ID 4	413	305	268	200	96
Format ID 5	310	228	201	150	72
Format ID 6	271	200	176	131	63

	Numeric	Alphanumeric	8 bit
ECC200	2000	2000	1556

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

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

		ECC000			ECC050			ECC080			ECC100			ECC140		
Symbol size		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

		ECC200		
Symbol size		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

		ECC200		
Symbol size		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 should be 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	Low ↑ ↓ High	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 per one line) is variable between 1 and 30.
If the number of columns is small when data amount is large and security level is high, drawing may not be performed. This is because the number of lines exceeds 90 when the number of columns becomes small. (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 90. 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.

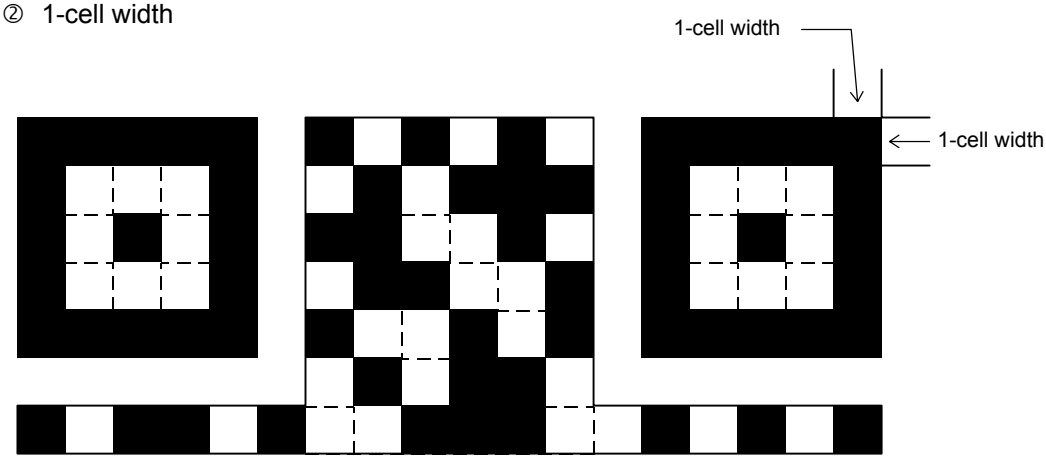
(17) Explanation for QR code

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 level should be specified according to usage. The general correction ability is as follows.

Level	Error correction ability	Overhead by correcting an error
High density level	Low ↑ ↓ High	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 supports 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 setting prevents the bit pattern “1011101”, which is characteristically seen in the position detecting pattern, from appearing in the symbol as much as possible.

The mask number is 0 to 7. The pattern is determined by placing each masking pattern for the mask number upon the module pattern. When the mask number is set to 8, masking is not performed. When the parameter is omitted, the most appropriate mask number is automatically selected to perform masking.

⑥ Connection setting

For QR code, data can be divided into several codes. Even though there is only a narrow print space, the code can be entered in the space by dividing the code. The data can be divided into a max. of 16 codes. Parity data is obtained by XORing all input data in units of bytes before dividing. The input data is calculated based on shift JIS for Kanji, or on JIS 8 for others. Examples are shown below:

“0123456789日本” is divided into “0123”, “4567”, and “89日本”.

Code No. 1	No. of divided codes: 3	Parity data: 84	Data “0123”
Code No. 2	No. of divided codes: 3	Parity data: 84	Data “4567”
Code No. 3	No. of divided codes: 3	Parity data: 84	Data “89日本”

* The parity data is the XORed value for “0123456789日本”.
  30 31 32 33 34 35 36 37 38 39 93 FA 96 7B = 84

(18) Explanation for MaxiCode

① Connection setting

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

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 the 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.)

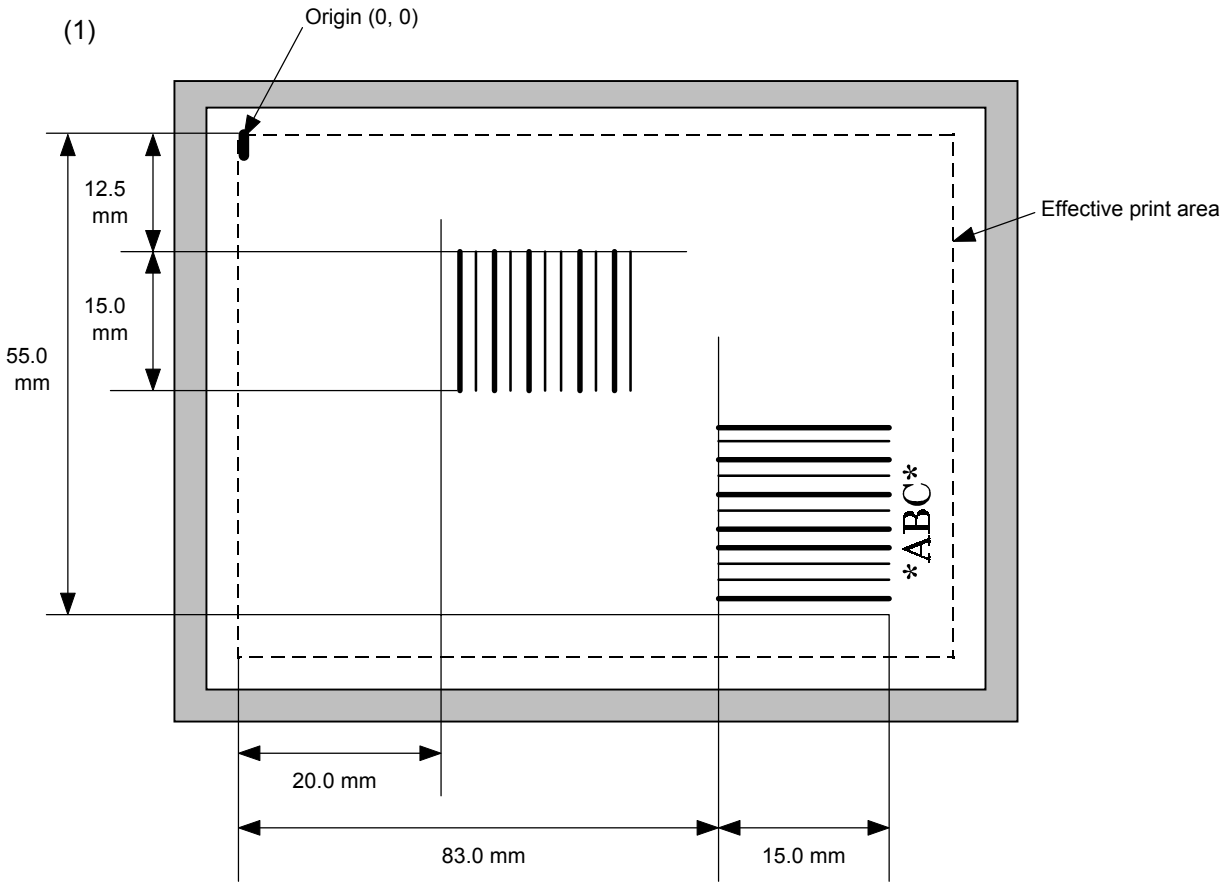
(5) The link field designation is cleared by omitting the link field designation using the same bar code No. and reformatting data.
The link field designation can also be cleared by the Image Buffer Clear Command.

(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)

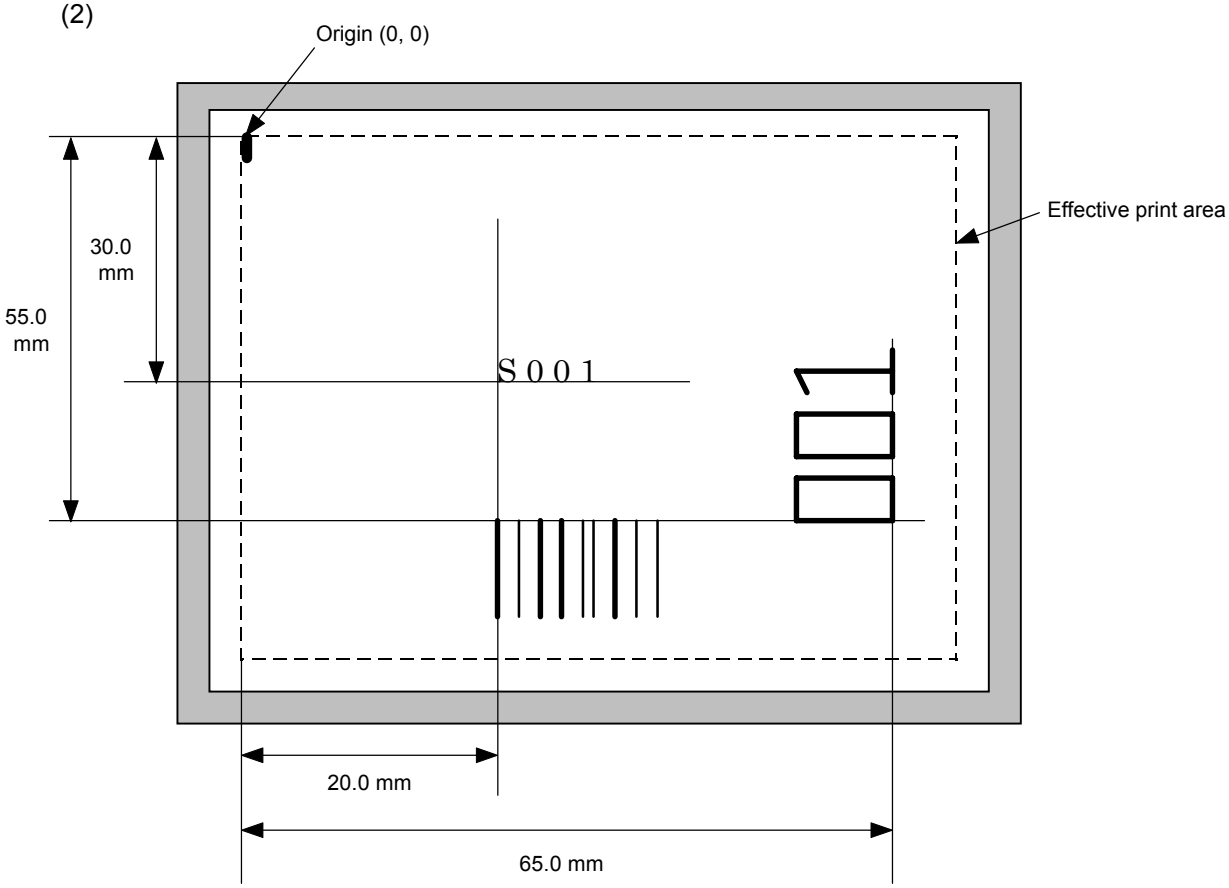
Examples

(1)



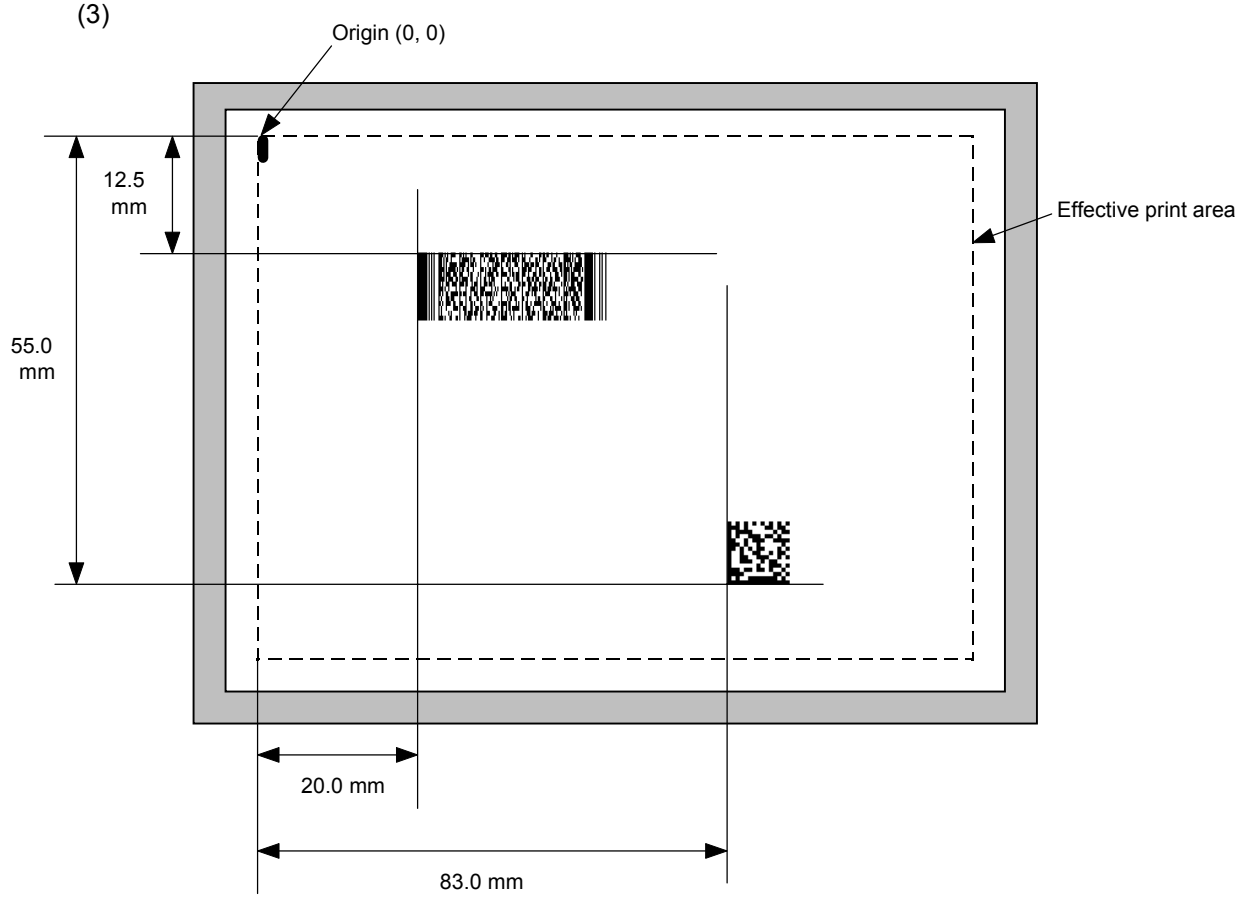
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 03, 03, 08, 08, 03, 0, 0150=12345 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

(2)



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

(3)



[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, P, 04, 02, 03, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 03, 05, 3 [LF] [NUL]
[ESC] RB01; PDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

6.3.11 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
(Max. 127 digits when the font type is 51, 52, 53, 54, or 55.)
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

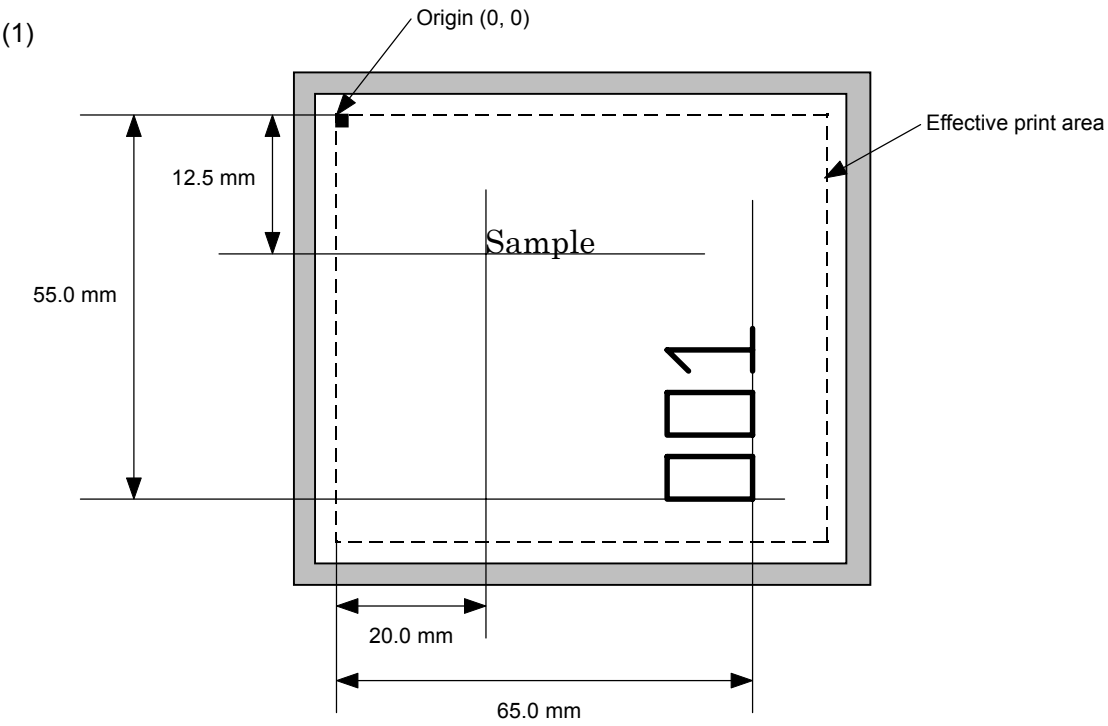
(1) Link field data string

- 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. However, when the font type is 51, 52, 53, 54, or 55, only up to 127 digits can be linked.
  When the number of digits exceeds the maximum value, excess data will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted in the Link Field Data Command, the following process is performed:
  ① No process will be performed for the field which contains no print data due to the omission.
  ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields, and 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)

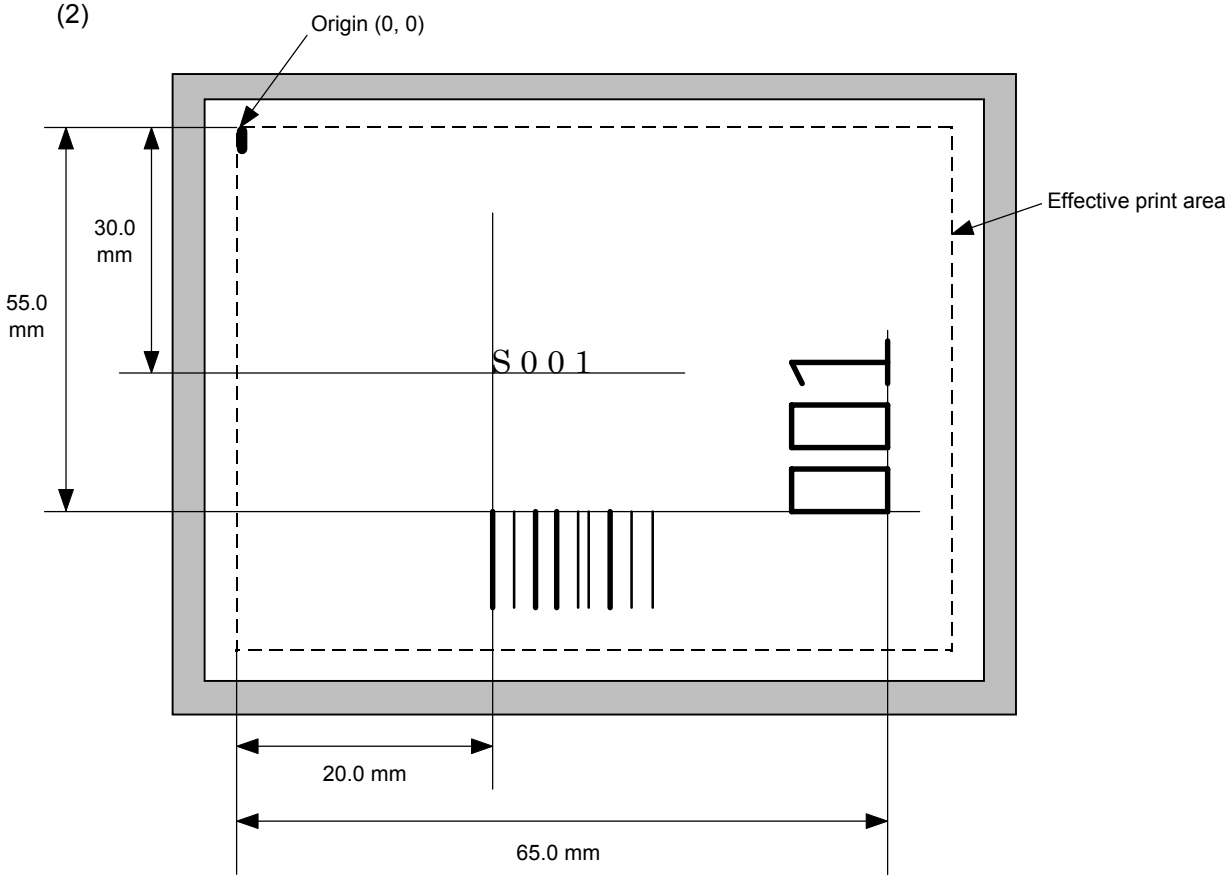
Examples

(1)



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

(2)



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

6.3.12 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

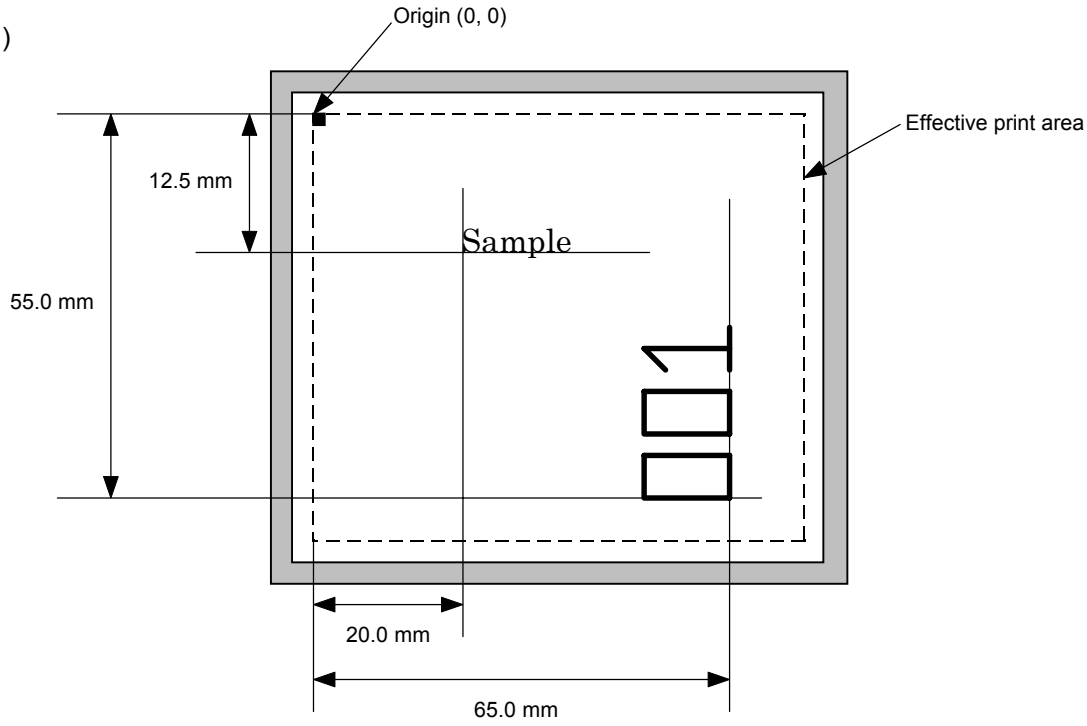
Explanation (1) Link field data string

- 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. Data exceeding the max. number of digits 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 process is performed:
  - ① No process will be performed for the field which contains no print data due to the omission.
  - ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields, and 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)

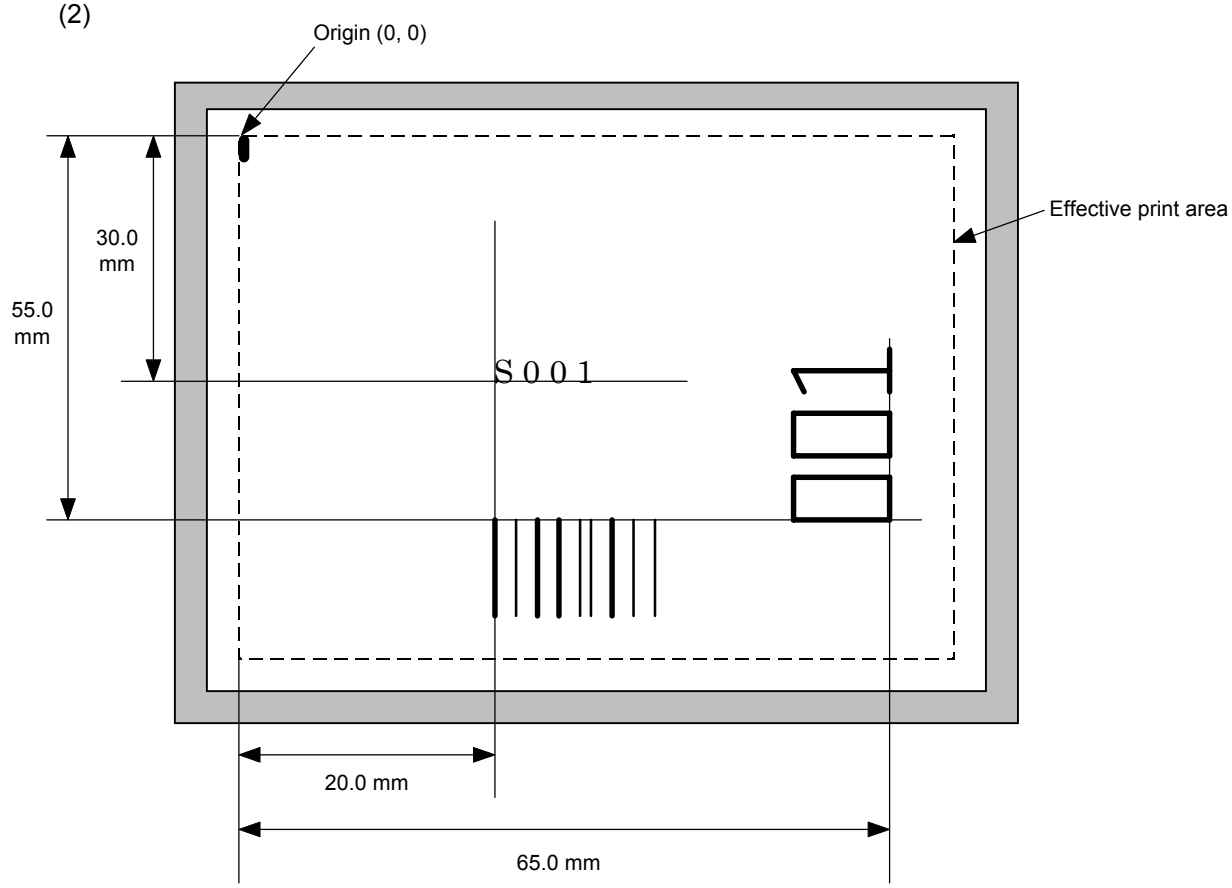
Examples

(1)



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

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RC; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

6.3.13 Bar Code Data Command [ESC] RB

Function Provides data for the bar code.

Format ① [ESC] RBaa; bbb ------ bbb [LF] [NUL]

② Link Field Data Command
[ESC] RB; ccc ------ ccc [LF] ddd ------ ddd [LF] ------ [LF] xxx ------ xxx [LF] [NUL]

Term

aa: Bar code number
00 to 31

bbb ------ bbb: Data string to be printed
The maximum number of digits varies according to the type of bar code.

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

The Data Command for the MaxiCode is described later.

Explanation

(1) Data check

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 (without auto code selection), the bar code will not be drawn.

If there is data different from the one designated using the format ID when Data Matrix is used, the symbol is not drawn.

(2) No. of digits of data

When data exceeding the maximum number of digits is sent, the excess data will be discarded. For the maximum number of digits for each bar code, see below.

Data Matrix, PDF417, QR code:	2000 digits
MicroPDF417:	366 digits
MaxiCode:	93 digits
Customer bar code:	20 digits
Highest priority customer bar code:	19 digits
POSTNET:	5, 9, or 11 digits
ROYAL MAIL 4 STATE CUSTOMER CODE:	12 digits
KIX CODE:	18 digits
Bar codes other than the above:	126 digits

When the number of digits does not correspond to the bar code type, the bar code is not be drawn.

For the MaxiCode, the maximum number of digits varies according to the mode. In mode 2 or 3 and mode 4 or 6, the maximum number of digits is 84 and 93, respectively.

The maximum number of digits for Data Matrix varies according to the settings for ECC type, format ID, and the cell size. In the case of Kanji, the maximum number of digits is half those of the values described below since a Kanji character occupies 2 bytes.

Max number of digits for Data Matrix

	ECC0	ECC50	ECC80	ECC100	ECC140
Format 1	500	457	402	300	144
Format 2	452	333	293	218	105
Format 3	394	291	256	190	91
Format 4	413	305	268	200	96
Format 5	310	228	201	150	72
Format 6	271	200	176	131	63

	Numeric	Alphanumeric	8 bit
ECC200	2000	2000	1556

Cell Size and Effective Data Capacity

		ECC000			ECC050			ECC080			ECC100			ECC140		
Symbol size		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

		ECC200		
Symbol size		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

		ECC200		
Symbol size		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 below.

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

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

When the number of the code words exceeds 928, or when the number of lines exceeds 90, the symbols are not drawn.

For the MicroPDF417, the numbers of rows and columns 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	Low ↑ ↓ High	0
Level 1		2
Level 2		6
Level 3		14
Level 4		30
Level 5		62
Level 6		126
Level 7		254
Level 8		510

The maximum number of columns and rows for the MicroPDF417

Parameter (gg)	No. of columns	No. of rows	Max. number of digits for binary mode	Max. number of digits for upper case letter/space mode	Max. number of digits for numeric mode
00	–	–	150	250	366
01	1	–	22	38	55
02	2	–	43	72	105
03	3	–	97	162	237
04	4	–	150	250	366
05	1	11	3	6	8
06		14	7	12	17
07		17	10	18	26
08		20	13	22	32
09		24	18	30	44
10		28	22	38	55
11	2	8	8	14	20
12		11	14	24	35
13		14	21	36	52
14		17	27	46	67
15		20	33	56	82
16		23	38	64	93
17		26	43	72	105
18	3	6	6	10	14
19		8	10	18	26
20		10	15	26	38
21		12	20	34	49
22		15	27	46	67
23		20	39	66	96
24		26	54	90	132
25		32	68	114	167
26		38	82	138	202
27		44	97	162	237
28	4	4	8	14	20
29		6	13	22	32
30		8	20	34	49
31		10	27	46	67
32		12	34	58	85
33		15	45	76	111
34		20	63	106	155
35		26	85	142	208
36		32	106	178	261
37		38	128	214	313
38		44	150	250	366

(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 (SHIFT) character before the first small letter.

(b) When not so, insert the (CODE B) character just before the first small letter.

⑥ If any data other than the numerals appears in (CODE C):

(a) Insert the (CODE A) or (CODE B) character just before the data other than the numerals. Selection of (CODE A) or (CODE B) should conform to (b) and (c) in ①.

(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, PDF417, and QR code, 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 max. number of digits varies according to the type of bar code.)
  When the number of digits exceeds the maximum value, excess data will be discarded.
- Up to 99 data strings can be linked.
- Up to 2048 bytes can be used as the command length ([ESC] to [NUL]) of the Link Field Data Command.
- When the data string is omitted in the Link Field Data Command, the following process is performed:

  ① No process will be performed for the field which contains no print data due to the omission.

  ② When the field partially loses print data due to the omission, the only remaining data will be processed as print data.
- The Link Field Data Command can be used for the bit map font fields, outline font fields, and 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)

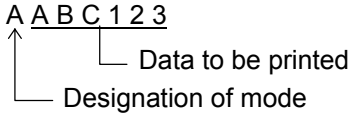
(10) Transfer code for QR code

	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								

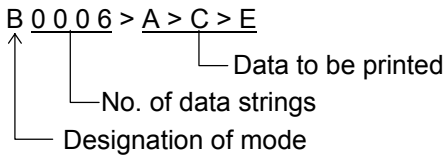
* The shaded parts are Japanese. They are omitted here.

(11) Examples of data designation

① Alphanumeric mode: ABC123

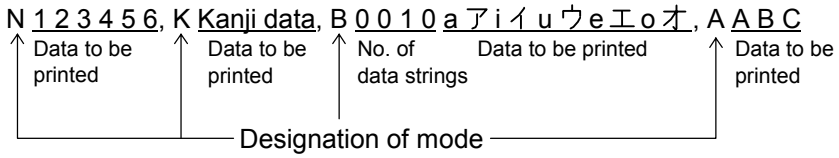


② Binary mode: 01H, 03H, 05H



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:

1 2 3 4 5 6 Kanji data aアｉイｕウｅエｏオA B C
Data to be printed

(12) MaxiCode data

For mode 2 or 3:
[ESC] RBaa; bbbbbbbbbcccdddeeeee --- eeeee [LF] [NUL]

For mode 4 or 6:
[ESC] RBaa; fffffffffggggg --- ggggg [LF] [NUL]

①	bbbbbbbbb:	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	fffffffff:	Primary message data strings	9 digits
⑥	ggg --- ggg:	Secondary message data strings	84 digits

NOTES: *1. When anything 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.*

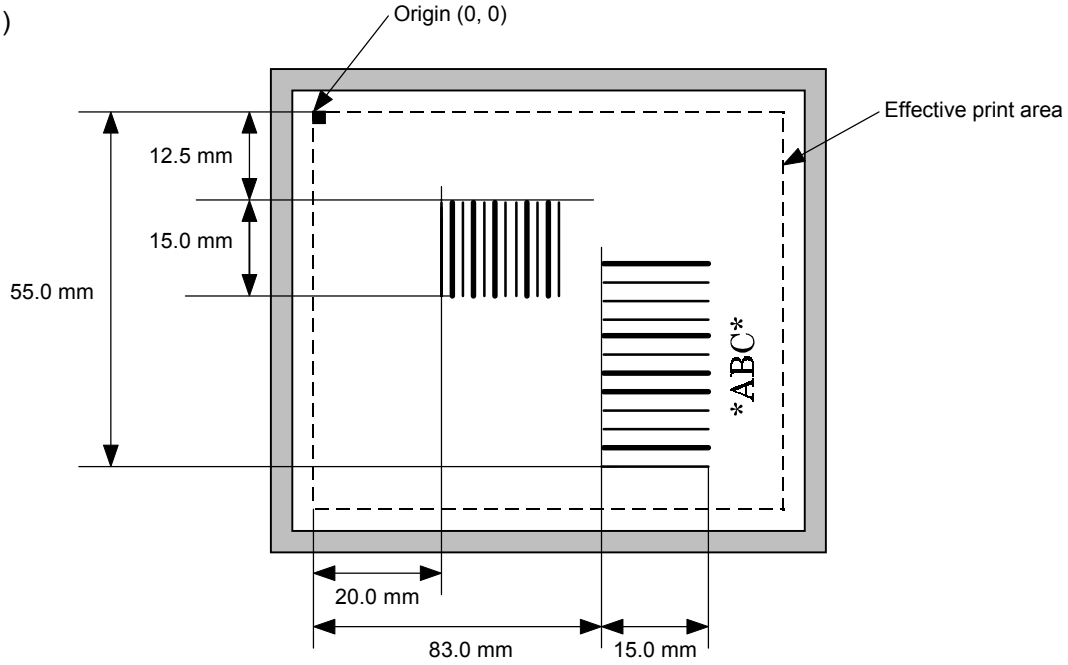
2. If the message data is less than 84 digits when mode 2 or 3 is selected, the printer adds a CR (000000) at the end of the data, and the remaining digits will be padded with FSs (011100). When message data exceeding 84 digits is received, the excess data will be discarded before drawing a MaxiCode.

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.

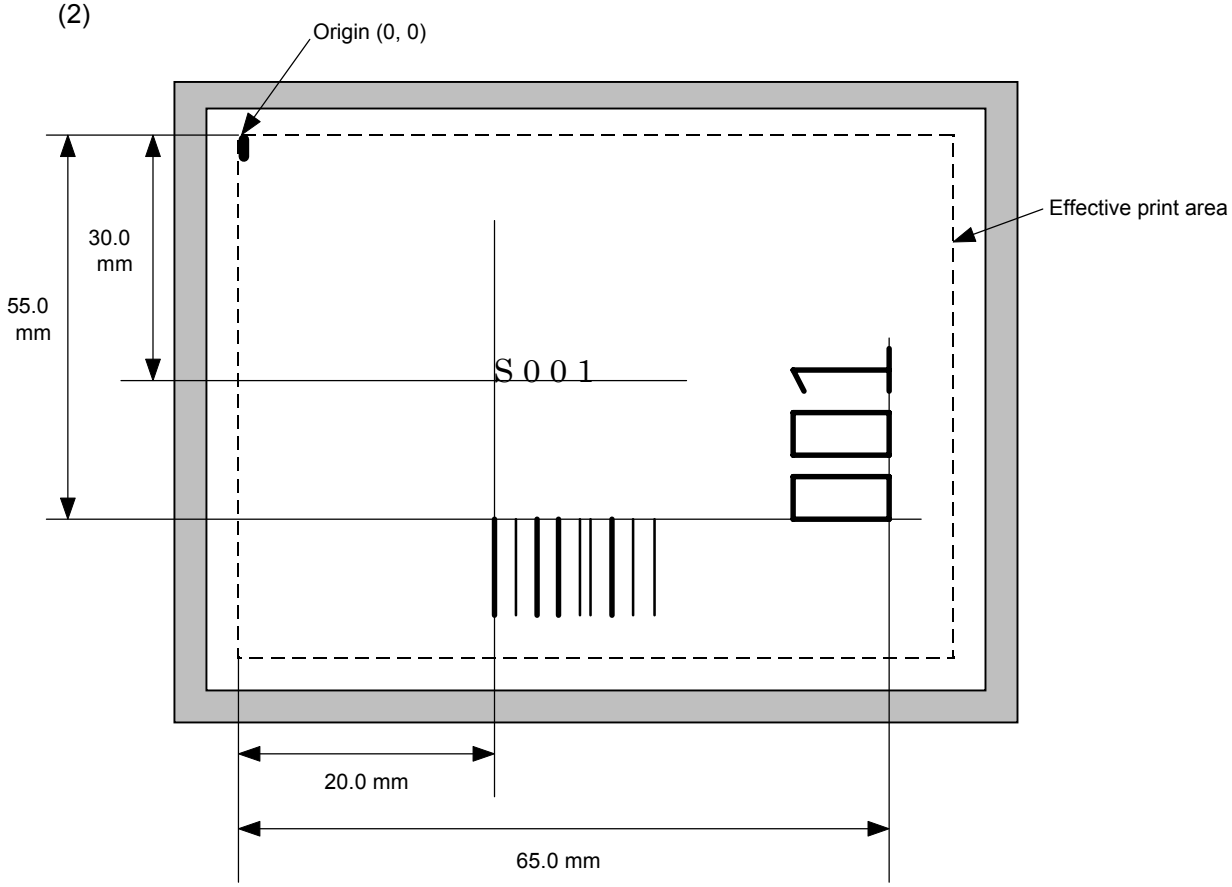
Examples

(1)



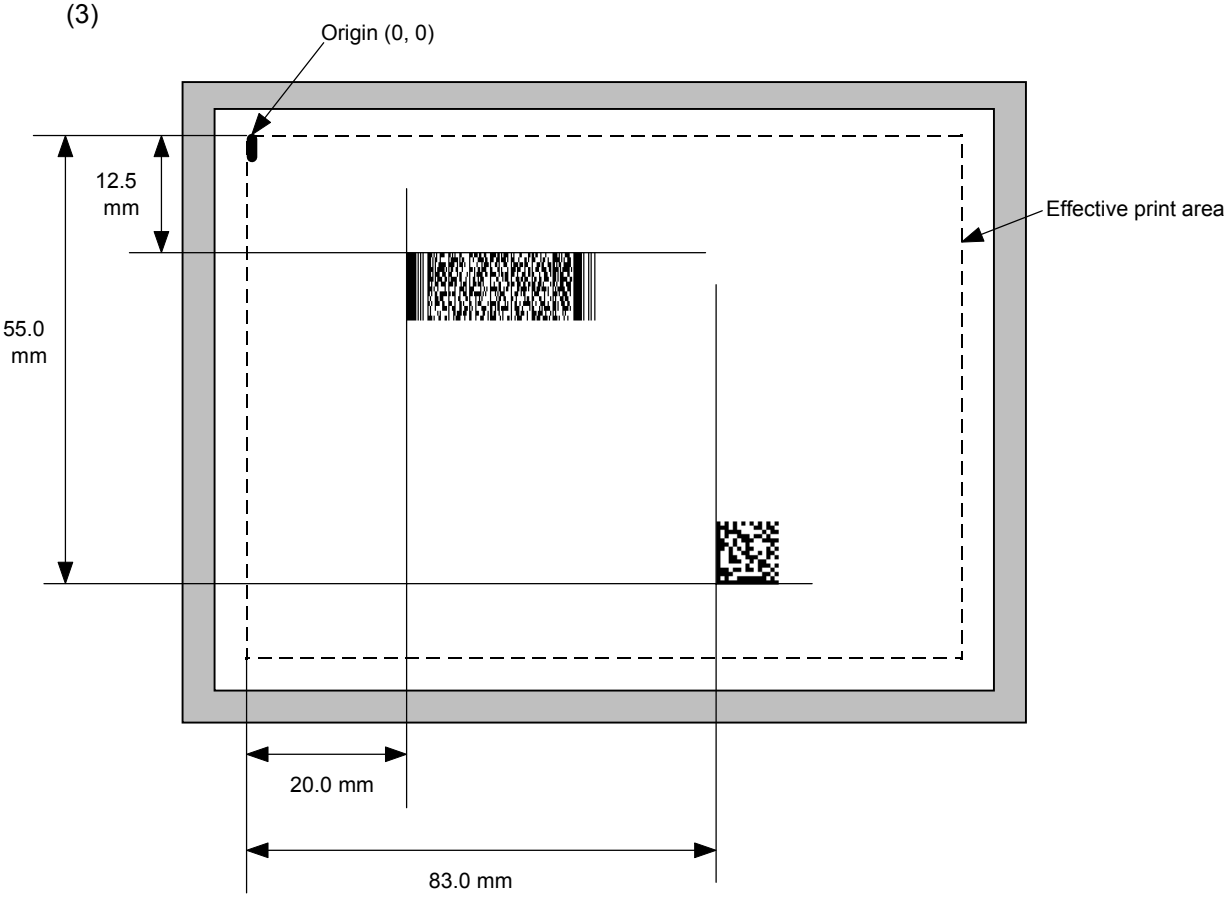
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, 3, 1, 02, 02, 06, 06, 02, 0, 0150 [LF] [NUL]
[ESC] XB02; 0830, 0550, 3, 1, 02, 04, 07, 08, 04, 3, 0150, +0000000000, 1, 00, N [LF] [NUL]
[ESC] RB01; 12345 [LF] [NUL]
[ESC] RB02; *ABC* [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

(2)



[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0300, 1, 1, C, 00, B; 01, 02 [LF] [NUL]
[ESC] PV01; 0650, 0550, 0200, 0150, B, 33, B; 02 [LF] [NUL]
[ESC] XB01; 0200, 0550, 3, 1, 02, 02, 06, 06, 02, 0, 0150; 01, 02 [LF] [NUL]
[ESC] RB; S [LF] 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

(3)



[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0125, P, 04, 02, 03, 0, 0010 [LF] [NUL]
[ESC] XB02; 0830, 0550, Q, 08, 04, 05, 3 [LF] [NUL]
[ESC] RB01; PDF417 [LF] [NUL]
[ESC] RB02; Data Matrix [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

6.3.14 Issue Command [ESC] XS

Function Issues labels according to the print conditions programmed.

Format [ESC] XS; l, aaaa, bbbcdefgh [LF] [NUL]

Term

aaaa: Number of labels to be issued
0001 to 9999

bbb: Cut interval. Designates the number of pieces to be printed before the backing paper is cut.
000 to 100 (no cut when 000)

c: Type of sensor
0: No sensor
1: Lower reflective sensor
2: Transmissive sensor (when using normal labels)
3: Transmissive sensor (when using preprinted labels)
4: Lower reflective sensor (when using a manual threshold value)
5: Upper reflective sensor (for detecting black marks on the print side of label):
6: Lower reflective sensor (for detecting marginal punched holes on the fanfold paper)

d: Issue mode
C: Batch mode
D or E: Strip mode for auto labeler

NOTE: *To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.*

e: Issue speed
2: 2 inches/sec
4: 4 inches/sec

f: With/without ribbon
0: Without ribbon
1 or 2: With ribbon

g: Designates tag rotation.
0: Printing bottom first
1: Printing top first
2: Mirror printing bottom first
3: Mirror printing top first

h: Type of status response
0: No status response
1: Status response

Explanation

(1) Number of labels to be issued

① If increment/decrement is not specified, the designated number of pieces with the same drawing data will be issued.

② If increment /decrement is specified, the designated number of pieces will be issued while incrementing/decrementing the piece of the designated drawing area.

* The increment/decrement designation is valid until the Image Buffer Clear Command ([ESC] C) is transmitted.

If no subsequent command is received from the PC for 1 second after issuing the last label, when automatic forward feed standby is set to “ON” in the system mode, the printer automatically performs a 19-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.

If any command is sent and processed after the Issue Command is sent, the automatic forward feed is not performed. Therefore, a command should not be sent after the Issue Command is sent. 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, performs the automatic forward feed, then stops.

(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.

(3) Type of sensor

① No sensor: Printing takes place according to the parameter designated by the Label Size Set Command.

② Lower reflective sensor:

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

⑤ Lower 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 lower reflective sensor and the paper position is finely adjusted for every piece, according to value set by the threshold setting operation (key operation).

⑥ Upper reflective sensor (for detecting black marks on the print side of label):

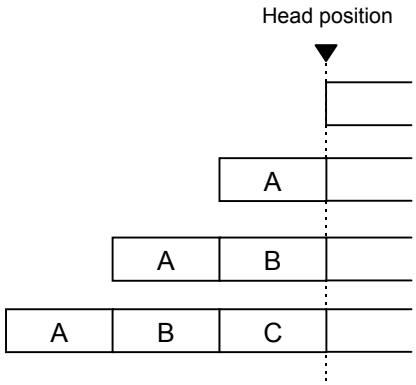
Printing takes place according to the parameter designated by the Label Size Set Command. However, the black mark provided on the print side of the tag paper is automatically sensed by the upper reflective sensor and the paper position is finely adjusted for every piece.

⑦ Lower reflective sensor (for detecting marginal punched holes on the fanfold paper):

Printing takes place according to the parameter designated by the Label Size Set Command. However, the marginal punched holes (round holes) on the fanfold paper are automatically sensed by the lower reflective sensor. Several round holes are automatically sensed according to the specified pitch length of label, and the paper position is finely adjusted for every piece.

(4) Issue mode

[C: Batch mode (cut interval 0)]



(1) Idling
(during automatic forward feed standby)

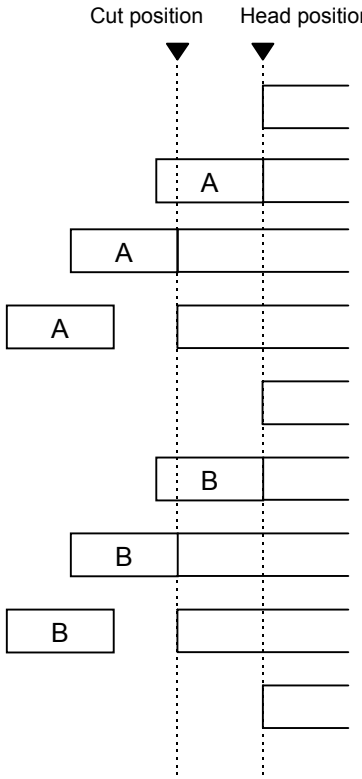
(2) Prints the 1st label (A)

(3) Prints the 2nd label (B)

(4) Prints the 3rd label (C)

[C: Batch mode (Cut interval: 1, Issue count: 2)]

Automatic forward feed standby is set to “OFF (Not performed)” in the system mode.



(1) Idling

(2) End of printing the 1st label (A)

(3) Feeds the 1st label (A) to the cut position

(4) Cuts the 1st label (A)

(5) Feeds back to the home position

(6) End of printing the 2nd label (B)

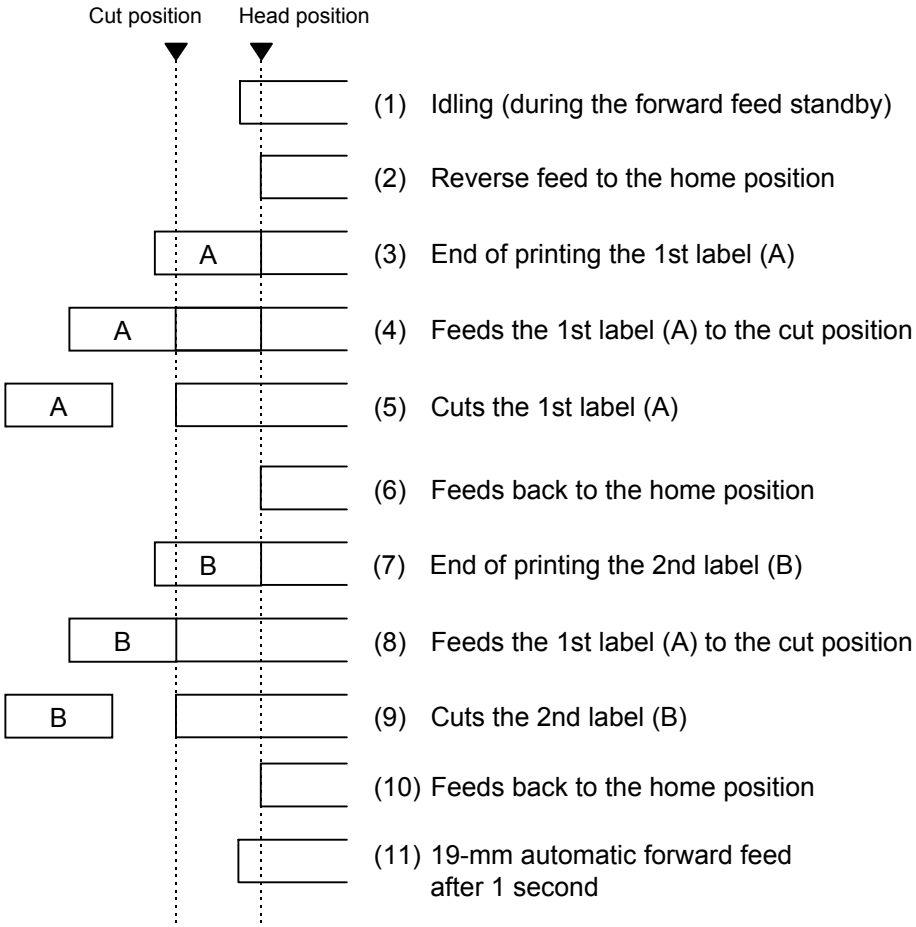
(7) Feeds the 2nd label (B) to the cut position

(8) Cuts the 2nd label (B)

(9) Feeds back to the home position

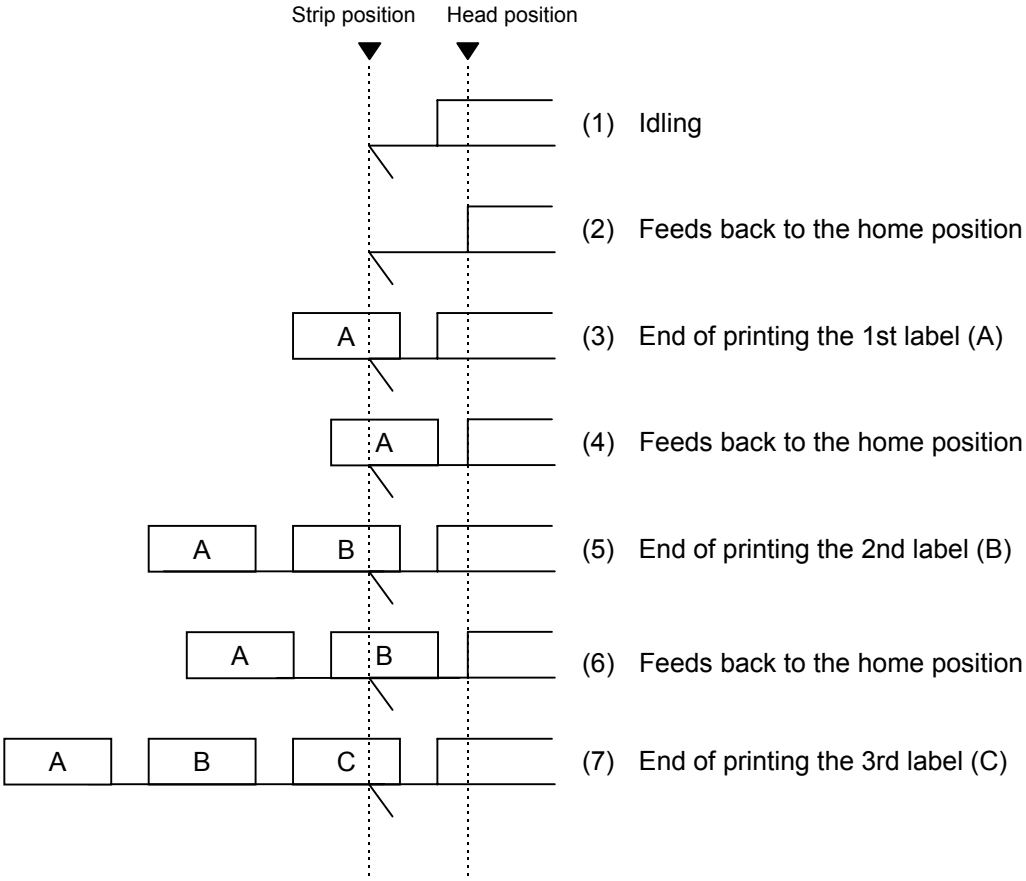
[C: Batch mode (Cut interval: 1, Issue count: 2)]

Automatic forward feed standby is set to “ON (Performed)” in the system mode.



[D or E: Strip mode for auto labeler]

NOTE: *To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.*



(5) Issue speed

- Printing takes place at the designated speed.
  However, the back feed speed in the cut issue mode and the strip issue mode for the auto labeler is 2”/sec.
- The possible issue speed varies according to types and sizes of the paper supply. For details, refer to the Supply Specification.

Parameter	Issue speed
1	2”/sec
2	
3	4”/sec
4	
5	
6	
7	
8	
9	
A	

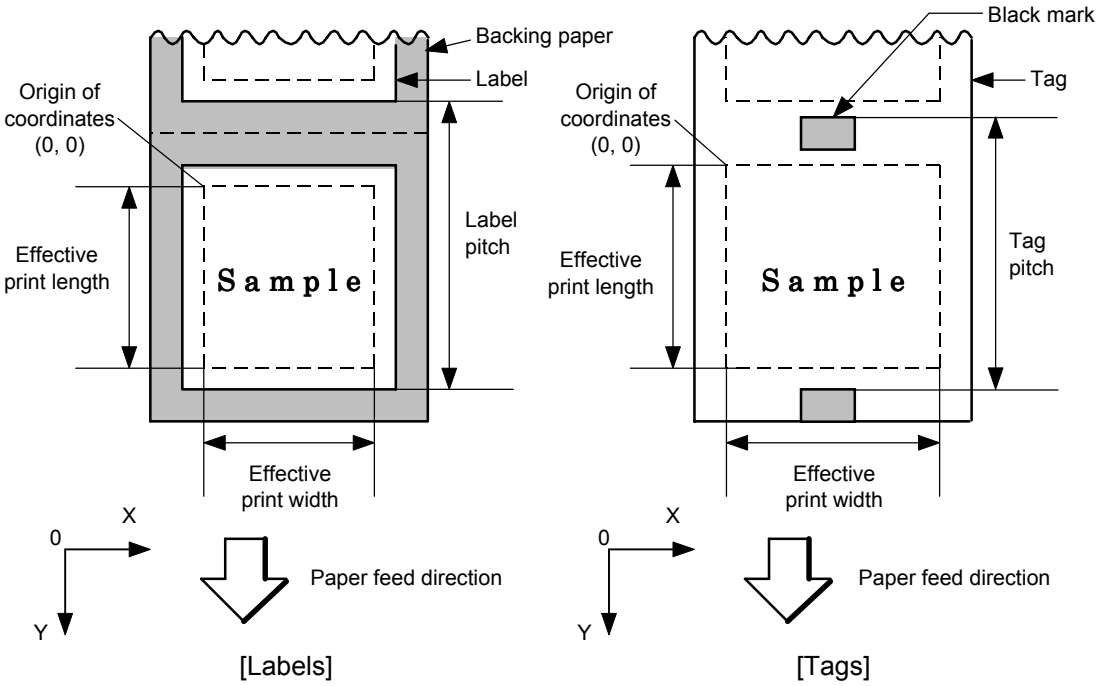
(6) With/without ribbon

Without ribbon: Use direct thermal paper.
With ribbon: Use thermal transfer ribbon.

(7) Tag rotation

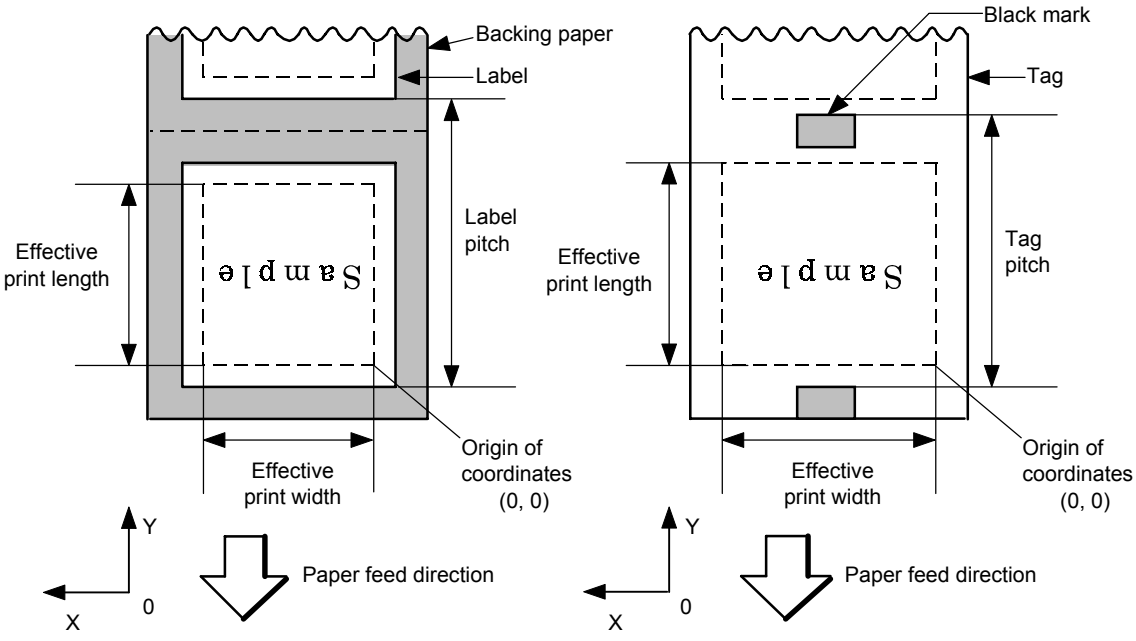
The origin of coordinates and printing direction vary according to the designation of tag rotation.

① Printing bottom first



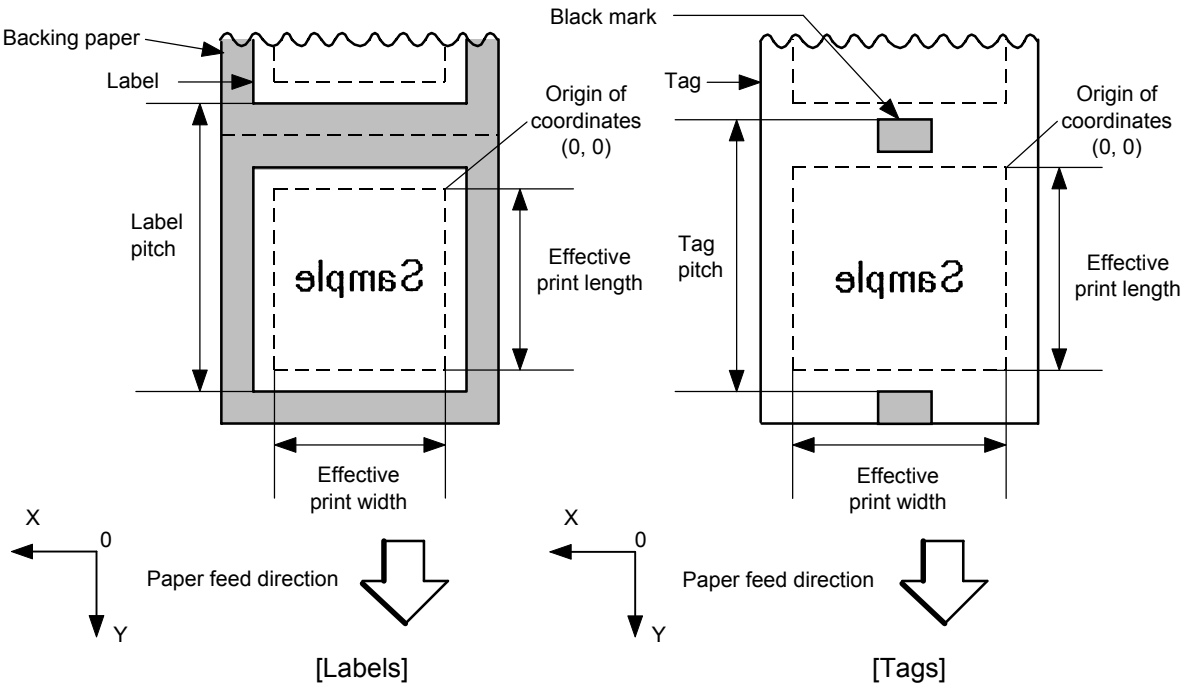
[Labels] [Tags]

② Printing top first

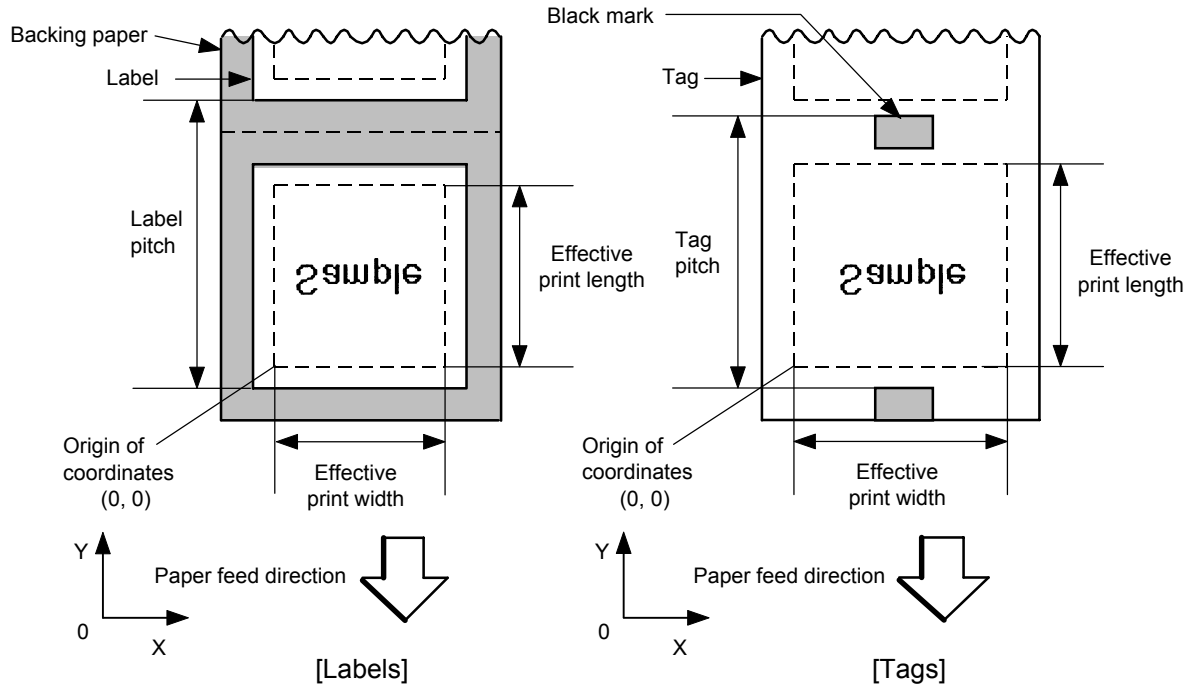


[Labels] [Tags]

③ Mirror printing bottom first



④ Mirror printing top first

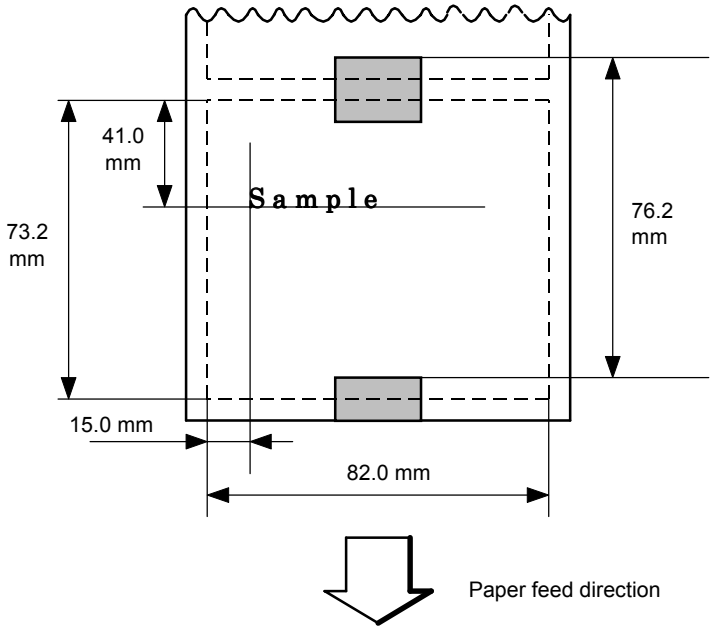


(8) Status response

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

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

Examples



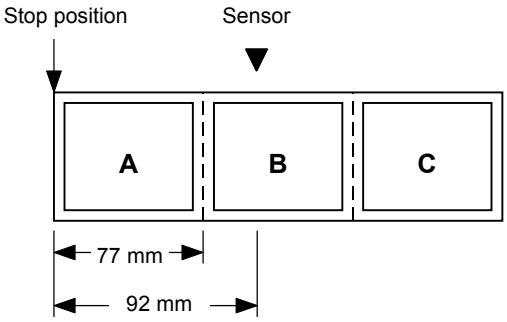
- Issue count: 4 pieces
- Cut interval: 1 piece
- Paper: Tag paper (Reflective sensor used)
- Issue mode: Cut issue
- Issue speed: 4”/sec.
- Ribbon: With
- Status response: On

[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C4201 [LF] [NUL]

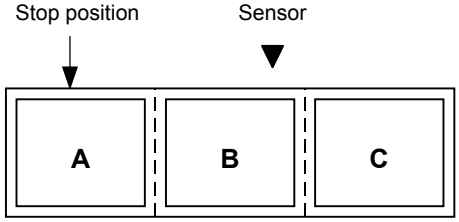
Notes

⊙ Explanation of processes involved to stop the label at the home position after the head-open state is detected:

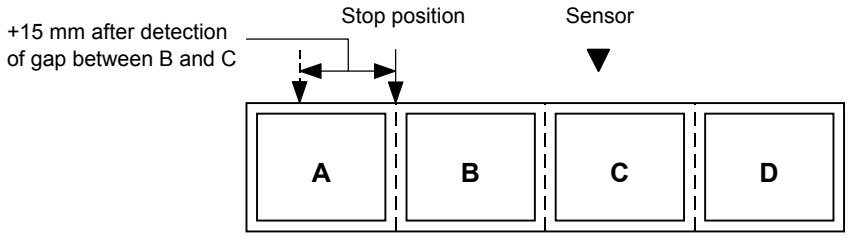
When the gap between labels (black mark) is found after the head open state is detected, the value to stop at the home position of each label between the head and the sensor is set again.



- The paper is moved in the above state.



- Stop position after feeding one label



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



Paper feed direction

6.3.15 Feed Command [ESC] T

Function Feeds the paper.

Format [ESC] Tabcde [LF] [NUL]

Term

a: Type of sensor
- 0: No sensor
- 1: Lower reflective sensor
- 2: Transmissive sensor (when using normal labels)
- 3: Transmissive sensor (when using preprinted labels)
- 4: Lower reflective sensor (when using a manual threshold value)
- 5: Upper reflective sensor (for detecting black marks on the print side of label)
- 6: Lower reflective sensor (for detecting marginal punched holes on the fanfold paper)

b: Selects cut or non-cut
- 0: Non-cut
- 1: Cut

c: Feed mode
- C: Batch mode (Cut and feed when "Cut" is selected for parameter b.)
- D or E: Strip mode for auto labeler

NOTE: *To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.*

d: Feed speed
- 2: 2 inches/sec
- 4: 4 inches/sec

e: With/without ribbon
- 0: Without ribbon
- 1 or 2: With ribbon

Explanation (1) Type of sensor

① No sensor:
Feeding takes place according to the parameter designated by the Label Size Set Command.

② Lower reflective sensor:
Feeding takes place according to the parameter designated by the Label Size Set Command. However, the black mark provided on the back of the tag paper is automatically sensed by the lower 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 transmissive 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 Lower 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 lower reflective sensor and the paper position is finely adjusted for every piece, according to the value set by the threshold set operation (key operation).

⑥ Upper reflective sensor (for detecting black marks on the print side of label):

Feeding takes place according to the parameter designated by the Label Size Set Command. However, the black mark provided on the print side of the tag paper is automatically sensed by the upper reflective sensor and the paper position is finely adjusted for every piece.

⑦ Lower reflective sensor (for detecting marginal punched holes on the fanfold paper):

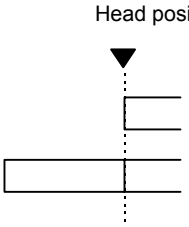
Feeding takes place according to the parameter designated by the Label Size Set Command. However, the marginal punched holes (round holes) on the fanfold paper are automatically sensed by the lower reflective sensor. Several round holes are automatically sensed according to the specified pitch length of label, and the paper position is finely adjusted for every piece.

(2) Cut/non-cut

This option is valid in batch feed mode only. (Non-cut is selected in the strip mode for the auto labeler.)

(3) Feed mode

[C: Batch (Non-cut)]

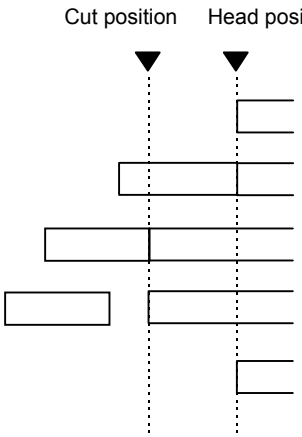


(1) Place paper.

(2) End of feed
(Completes feeding to the top of form and stops)

[C: Batch (Cut)]

Automatic forward feed standby is set to “OFF (Not performed)” in the system mode.



(1) Place paper.

(2) End of feed (Completes feeding to the top of form)

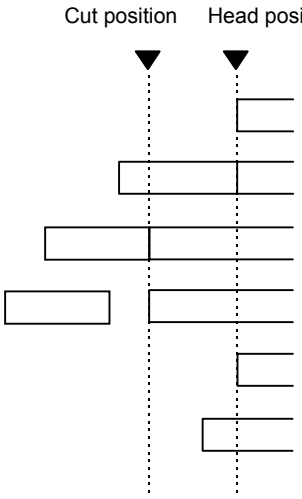
(3) Feeds to the cut position.

(4) Cuts unnecessary paper.

(5) Feeds back to the home position.

[C: Batch (Cut)]

Automatic forward feed standby is set to “ON (Performed)” in the system mode.



(1) Place paper.

(2) End of feed (Completes feeding to the top of form)

(3) Feeds to the cut position.

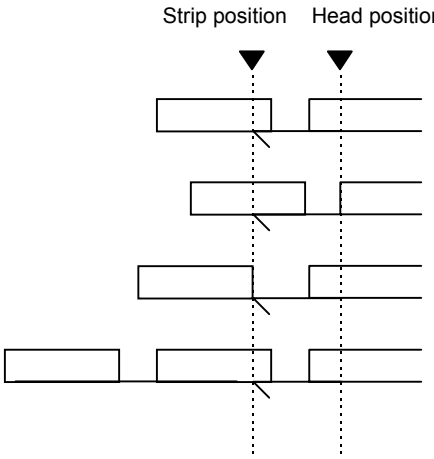
(4) Cuts unnecessary paper.

(5) Feeds back to the home position.

(6) 19-mm automatic forward feed after 1 second

[D or E: Strip mode for auto labeler]

NOTE: *To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.*



(1) Place paper.

(2) Feeds back to the home position.

(3) Feeding starts

(4) End of feed
(Completes feeding to the top of form and stops)

(4) Feed speed

- A feed is performed at the designated speed.
  However, the back feed speed in the cut mode or the strip mode for the auto labeler is 2”/sec.
- The possible feed speed varies according to types and sizes of the paper supply. For details, refer to the Supply Specification.

Parameter	Feed speed
1	2”/sec
2	
3	4”/sec
4	
5	
6	
7	
8	
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.

(6) If no subsequent command is received from the PC for 1 second after feeding labels, when automatic forward feed standby is set to “ON” in the system mode, the printer automatically performs a 19-mm forward feed. When the Feed Command is received during the automatic forward feed standby, a feed is started after a reverse feed to the original position.

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

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 print position prior to printing.

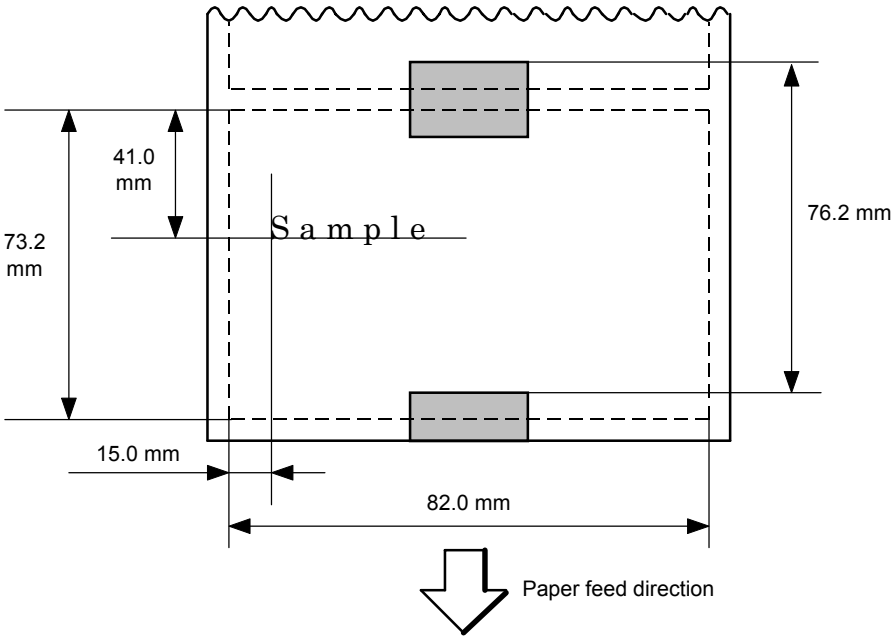
(2) The parameter of the Feed Command is protected in memory (even if the power is turned off).

(3) When “status response made” 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 process to stop the label at the home position, refer to the section regarding the Issue Command.

(5) If no subsequent command is received from the PC for 1 second after the last label has been fed, the printer automatically performs a 19-mm forward feed when the cut mode is selected and “with automatic forward feed standby” is selected in the system mode. When the Feed Command is received during the forward feed standby, the printer feeds the label in reverse to the original position and ejects it.
* For notes, refer to the section regarding the Issue Command.

Examples



[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] AX; +010, +000, +10 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C4001 [LF] [NUL]

6.3.16 Eject Command [ESC] IB

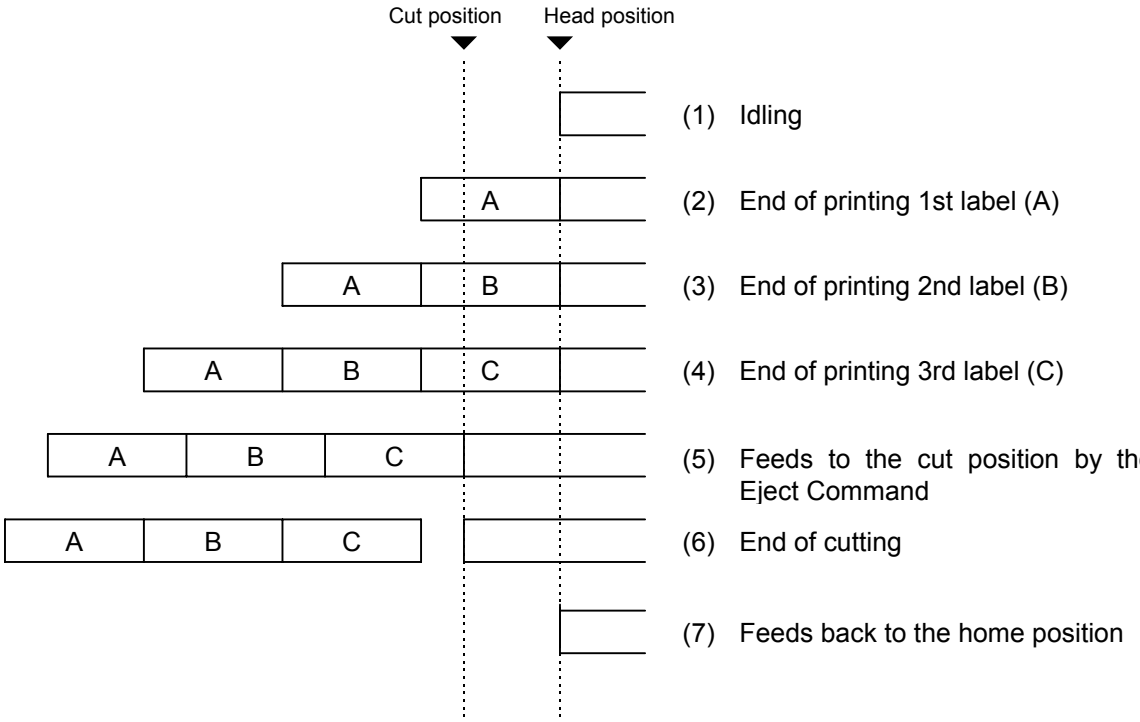
Function Ejects (cuts) the label presently remaining between the head and the cutter and returns to the original position.

Format [ESC] IB [LF] [NUL]

Notes If no subsequent command is received from the PC for 1 second after ejection, the printer automatically performs a 19-mm forward feed when the automatic forward feed standby is set to “ON” in the system mode.
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.

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

Examples




```
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; A [LF] [NUL]
[ESC] XS; I, 0001, 0001C4001 [LF] [NUL]
[ESC] RC001; B [LF] [NUL]
[ESC] XS; I, 0001, 0001C4001 [LF] [NUL]
[ESC] RC001; C [LF] [NUL]
[ESC] XS; I, 0001, 0001C4001 [LF] [NUL]
[ESC] IB [LF] [NUL]
```

6.3.17 Forward/Reverse Feed Command [ESC] U1, [ESC] U2

Function

After printing or feeding the paper, feeds the paper to the position at which the paper can be cut manually.
When issuing the next label, feeds the paper back to the first print position.

Format

Forward Feed

[ESC] U1; aaaa [LF] [NUL]

Reverse Feed

[ESC] U2; aaaa [LF] [NUL]

Term

aaaa: Feed length by which the paper is fed forward or backward.
0030 to 2000 (in 0.1 mm units)

Notes

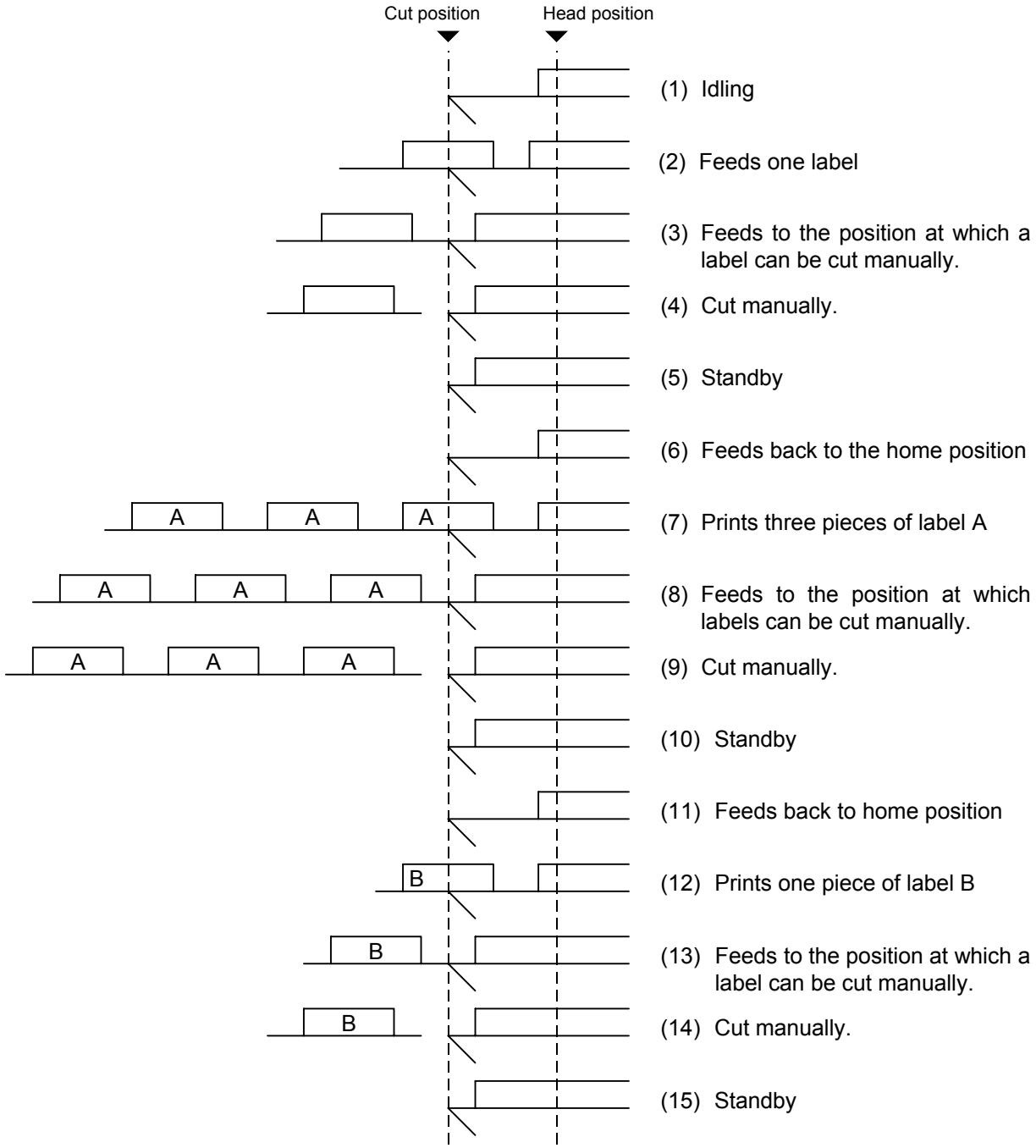
(1) If the Forward Feed Command has already been transmitted when the [FEED] key is pressed on the printer, a forward feed of the specified length is performed after one label is fed.

(2) The Forward/Reverse Feed Command is protected in memory (even if the power is turned off).

(3) The Forward/Reverse Feed Command is ignored in the strip issue mode for the auto labeler and the cut issue mode.

(4) The forward feed is performed at the speed designated in the Issue Command or Feed Command.
The reverse feed is performed at 2”/sec.

Examples



[ESC] T20C40 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]
Cut manually.
[ESC] U2; 0120 [LF] [NUL]
[ESC] RC001; A [LF] [NUL]
[ESC] XS; I, 0003, 0002C4001 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]
Cut manually.
[ESC] U2; 0120 [LF] [NUL]
[ESC] RC001; B [LF] [NUL]
[ESC] XS; I, 0001, 0002C4001 [LF] [NUL]
[ESC] U1; 0120 [LF] [NUL]

6.3.18 Storage Area Allocate Command [ESC] XF

Function Allocates the storage area in flash ROM on the CPU board.

Format [ESC] XF; aa, bb (, cc) [LF] [NUL]

Term

aa: Size of the TrueType font storage area
00 to 14 (0 KB to 896 KB) (in units of 64 KB)

bb: Size for bit map writable character storage area
00 to 14 (0 KB to 896 KB) (in units of 64 KB)

cc: Size for BASIC file storage area
00 to 14 (0 KB to 896 KB) (in units of 64 KB)
Omissible (If it is omitted, “0” is automatically set.)

Explanation

(1) The storage area in flash ROM has a total capacity of 896 KB.

(2) If this command is received, the complete area in flash ROM on the CPU board is cleared.

(3) If this command is not sent, the storage area in flash ROM on the CPU board cannot be used.

(4) The storage areas are allocated in the following order – the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area. After these storage areas are allocated, the remaining area is used for the PC save area.

(5) If the sum of the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, specified by this command, is 896 KB, the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area are allocated as specified. However, the PC save area is not allocated.

(6) If the sum of TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, specified by this command, exceeds 896 KB, the TrueType font storage area is allocated first, as specified. Then, the remaining area is allocated to the bit map writable character storage area. If there is remaining area after the TrueType font storage area and the bit map writable character storage area are allocated, it is used for the BASIC file storage area. The PC save area is not allocated.

(7) When “00” (0 KB) is specified for the TrueType font storage area, the bit map writable character storage area, or the BASIC file storage area, this storage area is not allocated.

(8) When “14” (896 KB) is specified for any of the TrueType font storage area, the bit map writable character storage area, and the BASIC file storage area, all storage areas are used for the specified area. Therefore, other storage areas cannot be allocated. For example, if “14” is specified for the TrueType Font storage area, all storage areas are used for the TrueType Font storage area. The bit map writable character storage area, the BASIC file storage area, and the PC save area cannot be allocated.

Refer to

- Bit Map Writable Character Command ([ESC] XD)
- Save Start Command ([ESC] XO)
- Memory Card Format Command ([ESC] J1)
- 2-byte Writable Character Code Range Command ([ESC] XE)

Example

The TrueType font storage area, bit map writable character storage area, and BASIC file storage area are set to 512 KB, 192 KB, and 64 KB, respectively.
(PC save area: 896 KB - 512 KB -192 KB - 64 KB = 128 KB)

[ESC] XF; 08, 03, 01 [LF] [NUL]

6.3.19 Memory Card Format Command [ESC] J1, [ESC] JA

Function

Formats (initializes) the flash memory card or the ATA card for storage.

Format

For flash memory card:

[ESC] J1; a (, b) [LF] [NUL]

For ATA card:

[ESC] JA; b [LF] [NUL]

Term

a: Formatting (initializing) range for flash memory card
- A: All area of the flash memory card
- B: PC save area of the flash memory card
- C: Writable character storage area of the flash memory card

b: Drive (Omissible in the Memory Card Format Command ([ESC] J1). If omitted, flash ROM on the CPU board is selected.)
- 0: Flash ROM on the CPU board (It can be specified in [ESC] J1 only.)
- 1: Slot 1 on the PCMCIA board (Option)
- 2: Slot 2 on the PCMCIA board (Option)

Explanation

(1) Only a 4-MB flash memory card can be formatted.

(2) The flash memory card can be roughly divided into the PC save area and the writable character storage area. They can be formatted (initialized) either separately or at the same time.

(3) When using a new flash memory card, the area to be used must be formatted (initialized) before the PC interface commands or writable characters are stored.

(4) After formatting the flash memory card, the remaining memory is the PC save area (895 Kbytes) and writable character storage area (3147 Kbytes). The remaining memory is displayed on the LCD.

(5) When the flash memory card is used and the already stored data (PC interface commands, writable characters, logos) is stored again, memory is consumed with every storing unless the Memory Card Format Command ([ESC] J1) is transmitted.

(6) When performing the label issue operation after sending the Memory Card Format Command, the image buffer is automatically cleared.

(7) 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.

(8) Before the ATA card is formatted, the Web printer function should be set to OFF.

Refer to

- Bit Map Writable Character Command ([ESC] XD, [ESC] XA)
- Save Start Command ([ESC] XO, [ESC] XV)
- Save Terminate Command ([ESC] XP)

Example

[ESC] J1; A, 1 [LF] [NUL]

[ESC] JA; 2 [LF] [NUL]

6.3.20 2-byte Writable Character Code Range Command [ESC] XE

Function Sets the code range when a 2-byte writable character code is stored in flash ROM on the CPU board.

Format [ESC] XE; $a_1a_1a_1a_1$, $b_1b_1b_1b_1$, $a_2a_2a_2a_2$, $b_2b_2b_2b_2$ ------, $a_na_na_na_n$, $b_nb_nb_nb_n$ [LF] [NUL]

Term

aaaa: First character code for each range
2020 to FFFF (Indicates the hex. data in ASCII code.)

bbbb: No. of characters for each range
0001 to 4000 (Indicates the hex. data in ASCII code.)

Explanation

(1) For a 2-byte character code such as Kanji, the character code range may be divided into two or more. The control information area for the unnecessary code can be deleted by designating the character code range, and the capacity of flash memory is not wasted.

(2) The total number of characters for each range must not exceed 0x4000 (16384 characters).

(3) Up to 2700 can be designated for the range.

(4) A character code which is not appropriate for the setting for this command cannot be stored.

Refer to

- Memory Card Format Command ([ESC] J1)
- Bit Map Writable Character Command ([ESC] XD)

Example In the case that Shift JIS 8140H to 83DFH:

Character data is present.
Character data is not present.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
8140	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
:	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
81F0	■	■	■	■	■	■	■	■	■	■	■	■	■			
:																
8240	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
:	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
82F0	■	■	■	■	■	■	■									
:																
8340	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
:	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
83D0	■	■	■	■	■	■	■	■	■	■	■	■	■			

[ESC] XE; 8140, 00BD, 8240, 00B7, 8340, 00BD [LF] [NUL]

6.3.21 Bit Map Writable Character Command [ESC] XD, [ESC] XA

Function

Writes writable characters and logos in the flash memory card, the ATA card, or flash ROM on the CPU board.

Format

For the flash memory card or flash ROM on the CPU board

[ESC] XD; (Sj,) aa, b, ccc, ddd, eee, fff, ggg, h, iii ------ iii [LF] [NUL]

For ATA card:

[ESC] XA; j, aa, b(b), ccc, ddd, eee, fff, ggg, h, iii ------ iii [LF] [NUL]

Term

Sj: Drive in which writable characters or logos are stored
(Omissible in the Bit Map Writable Character Command for the flash memory card ([ESC] XD). If omitted, flash ROM on the CPU board is selected.)

j: Drive

0: Flash ROM on the CPU board (It can be specified in [ESC] XD only.)
1: Slot 1 on the PCMCIA board (Option)
2: Slot 2 on the PCMCIA board (Option)

aa: Writable character set

- Flash memory card

01 to 40	
41	16 × 16 dots
42	24 × 24 dots
43	32 × 32 dots
44	48 × 48 dots

- ATA card

01 to 40	
41	16 × 16 dots
42	24 × 24 dots
43	32 × 32 dots
44	48 × 48 dots
51 to 55	(2-byte code character)

- Flash ROM on the CPU board

01 to 40	
41	16 × 16 dots
42	24 × 24 dots
43	32 × 32 dots
44	48 × 48 dots
51	2-byte code character

b(b): Writable character code

- Flash memory card
  20H to FFH (Set in hex.)
  40H to 7EH, 80H to FCH (When the writable character set is 41 to 44)
- ATA card
  20H to FFH (Set in hex.)
  40H to 7EH, 80H to FCH (When the writable character set is 41 to 44)
  2020H to FFFFH (When the writable character set is 51 to 55)
- Flash ROM on the CPU board
  20H to FFH (Set in hex.)
  40H to 7EH, 80H to FCH (When the writable character set is 41 to 44)
  2020H to FFFFH (When the writable character set is 51)

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

* If each parameter for left offset, top offset, character width, character height, and horizontal spacing/proportional spacing is fixed as “000”, the setting is ignored when the writable character set is 41 to 44,

Explanation

(1) Type of writable character

Up to 44 and 49 writable character sets can be stored for the flash card and the ATA card, respectively. However, the maximum number of characters varies depending on the writable character size and the number of characters because of the limited memory capacity. For writable character sets, 41 to 44, each writable character size is fixed.

(2) Character code

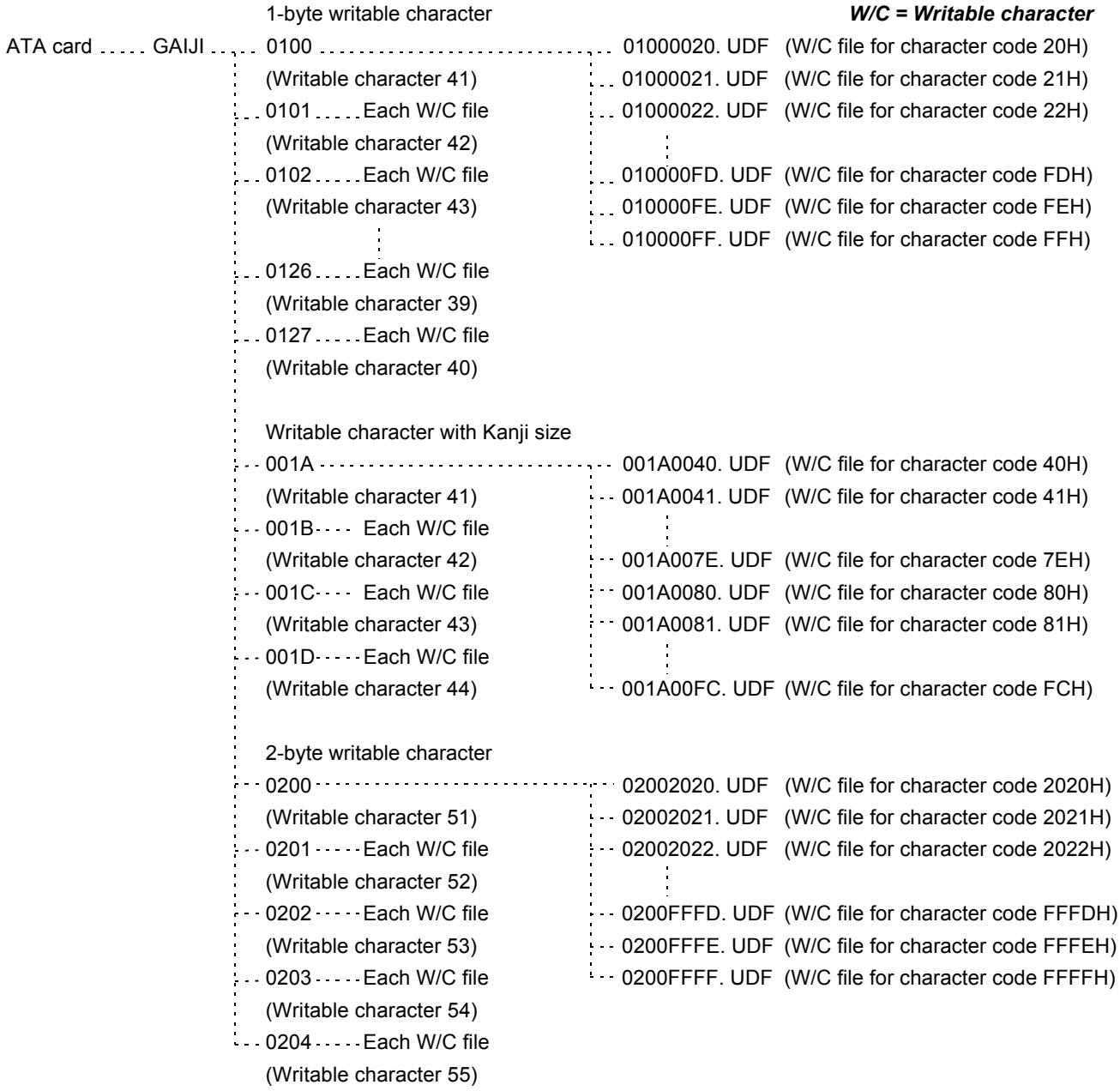
Up to 224 characters can be stored per character set. The maximum number of characters is 40 sets × 224 characters = 8960 characters. It varies depending on the writable character size and the number of characters because of the limited memory capacity. For character sets, 41 to 44, a character code consisting of 1 byte is stored. However, when the character code is called up, F0H is added to the upper digit of it, and consists of 2 bytes. In this case, up to 188 characters can be stored per character set.

(3) Only a 4-MB flash memory card can be used for storing a writable character.

(4) The configuration of the writable character file stored in the ATA card is as follows.

1st byte	No. of dots for left offset
2nd byte	(from upper to lower)
3rd byte	No. of dots for top offset
4th byte	(from upper to lower)
5th byte	No. of dots for character height
6th byte	(from upper to lower)
7th byte	No. of dots for character width
8th byte	(from upper to lower)
9th byte	No. of dots for horizontal spacing/proportional spacing
10th byte	(from upper to lower)
11th byte ⋮	Writable character data (Hex. data) (If it is stored in the nibble mode, data is 8 bits/byte.)

(5) When writable characters are stored in the ATA card, the “GAIJI” directory is created, and then the directory for each writable character set is created under the “GAIJI” directory level as shown on the next page. One writable character file is created in the writable character set directory per writable character.



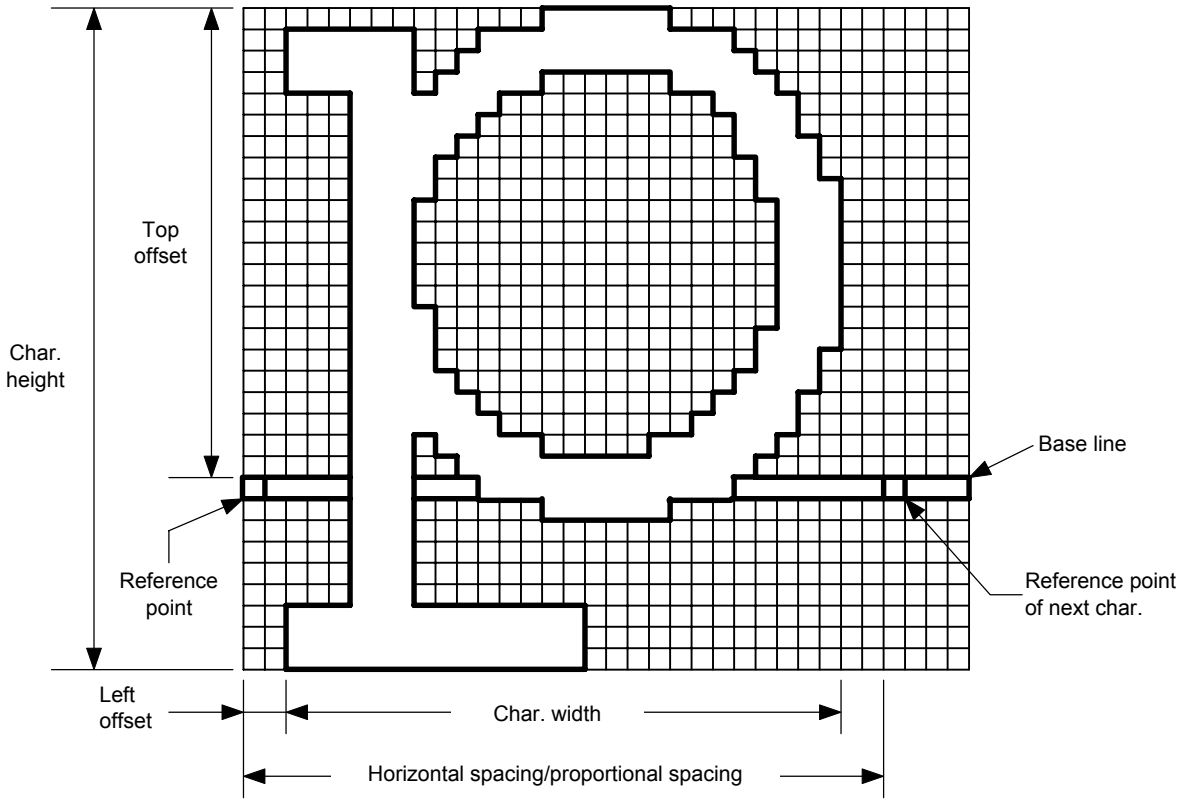
• How to assign the directory name for a writable character set

Directory name for writable character 01 → "0100"
Directory name for writable character 02 → "0101"
⋮
Directory name for writable character 39 → "0126"
Directory name for writable character 40 → "0127"
Directory name for writable character 41 → "001A"
⋮
Directory name for writable character 44 → "001D"
Directory name for writable character 51 → "0200"
⋮
Directory name for writable character 55 → "0204"

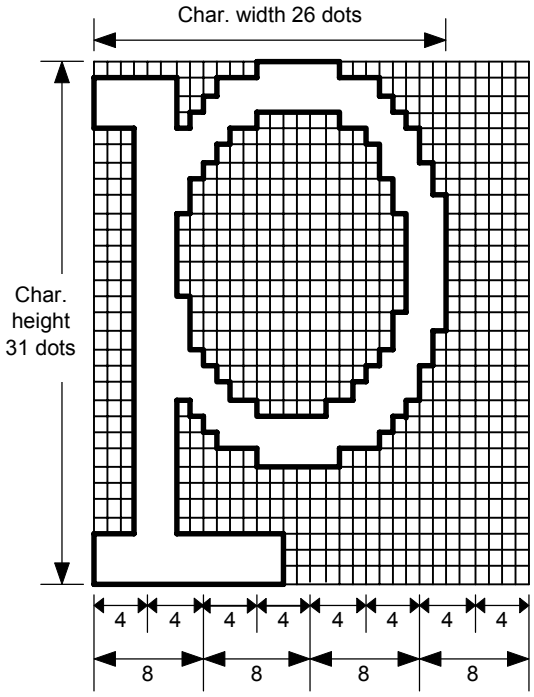
• How to assign the file name

0100 0022. UDF (Writable character 40: writable character file for character code 22H)
- UDF: Identifier indicating the writable character file
- 0022: Character code (2-byte code: Code 22H)
- 0100: Writable character set (Writable character 40: Same as the directory name)

(6)



(7) Writable character set: 01 to 40, 51 to 55



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
121	FFH	***122***	FCH	***123***	00H	***124***	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. of char. width dots + 7)/8} × No. of char. height dots × 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. of char. width dots + 7)/8} × No. of char. height dots
* The value in the brackets is rounded down to the nearest whole number.

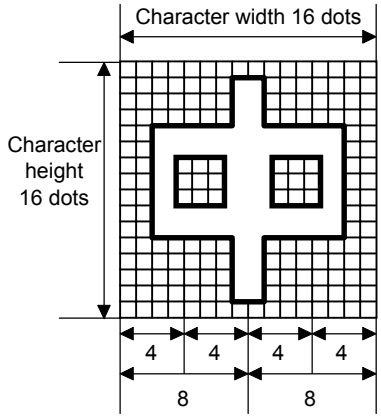
Notes

(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 characters are possible depending on the parameters of horizontal spacing/proportional spacing, left offset, and top offset.

(3) When top offset is 000, the reference coordinates are at the above left when drawing because the base line is at the top. (Coordinate setting is facilitated for logos.)

(8) Writable character set: 41 (16×16 dots)



Nibble mode							
1	30H	***2***	30H	***3***	30H	***4***	30H
5	30H	***6***	31H	***7***	38H		
				•			
				•			
				•			
		58	31H	***59***	38H	***60***	30H
61	30H	***62***	30H	***63***	30H	***64***	30H

Hex. mode							
1	00H	***2***	00H	***3***	01H	***4***	80H
5	01H	***6***	80H	***7***	01H		
				•			
				•			
				•			
		26	80H	***27***	01H	***28***	80H
29	01H	***30***	80H	***31***	00H	***32***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in the following order (***1*** → ***64***). (High order digit: “3”)

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 64 bytes.

[Hex. mode]

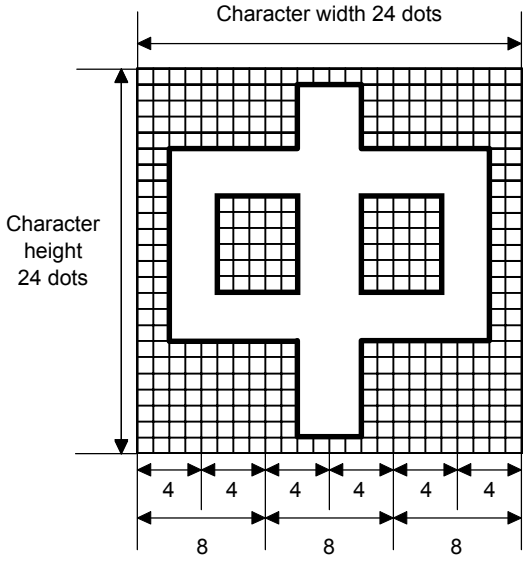
(1) The writable character data to be stored is separated into eight dot units and sent in the following order (***1*** → ***32***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 32 bytes.

* When writable character 41 is designated, the width and height of the character are both 16 dots.

(9) Writable character set: 42 (24×24 dots)



Nibble mode										
1	30H	***2***	30H	***3***	30H	***4***	30H	***5***	30H	***6***	30H
7	30H	***8***	30H	***9***	33H						
						•					
						•					
						•					
						•					
						•		***137***	30H	***138***	30H
139	30H	***140***	30H	***141***	30H	***142***	30H	***143***	30H	***144***	30H

Hex. mode					
1	00H	***2***	00H	***3***	00H
4	00H	***5***	3CH	***6***	00H
			•		
			•		
			•		
			•		
67	00H	***68***	3CH	***69***	00H
70	00H	***71***	00H	***72***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in the following order (***1*** → ***144***). (High order digit: “3”)

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 144 bytes.

[Hex. mode]

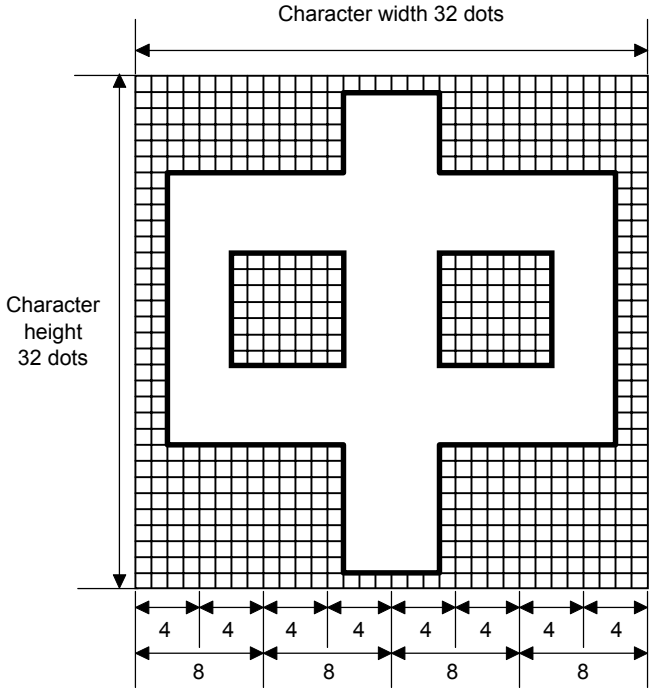
(1) The writable character data to be stored is separated into eight dot units and sent in the following order (***1*** → ***72***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 72 bytes.

* When writable character 42 is designated, the width and height of the character are both 24 dots.

(10) Writable character set: 43 (32×32 dots)



Nibble mode												
1	30H	***2***	30H	***3***	30H	***4***	30H	***5***	30H	***6***	30H	***7***	30H
8	30H	***9***	30H	***10***	30H	***11***	30H	***12***	37H				
							•						
							•						
							•						
							•						
							•			***248***	30H	***249***	30H
250	30H	***251***	30H	***252***	30H	***253***	30H	***254***	30H	***255***	30H	***256***	30H

Hex. mode							
1	00H	***2***	00H	***3***	C0H	***4***	00H
5	00H	***6***	07H	***7***	C0H		
				•			
				•			
				•			
				•			
				123	C0H	***124***	00H
125	00H	***126***	00H	***127***	00H	***128***	00H

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in the following order (***1*** → ***256***). (High order digit: "3")

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 256 bytes.

[Hex. mode]

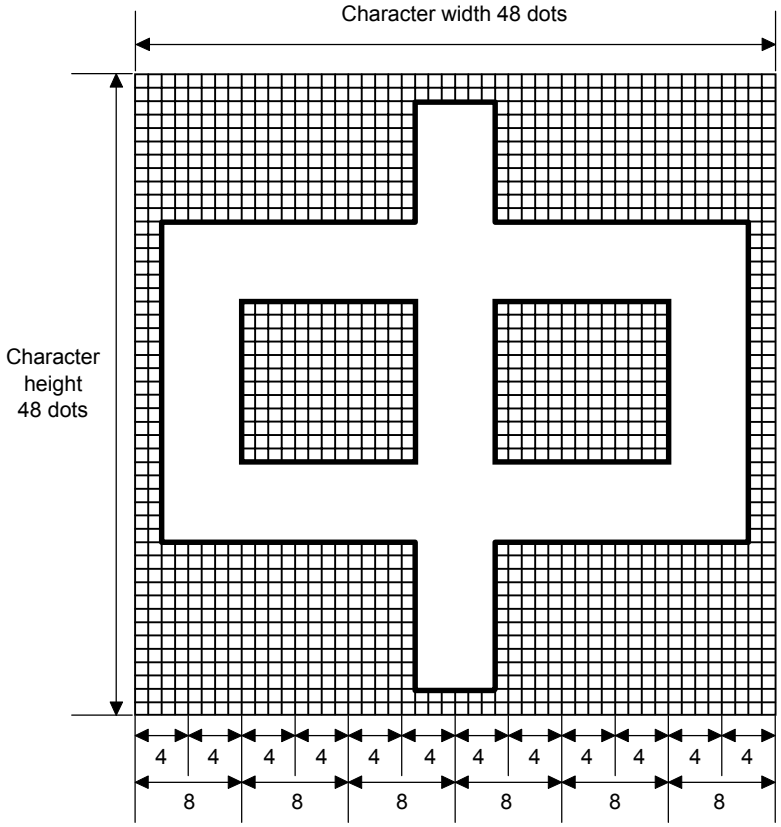
(1) The writable character data to be stored is separated into eight dot units and sent in the following order (***1*** → ***128***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 128 bytes.

* When writable character 43 is designated, the width and height of the character are both 32 dots.

(11) Writable character set: 44 (48×48 dots)



Nibble mode												
1	30H	***2***	30H	***3***	30H	***4***	30H	***5***	30H	***6***	30H	
7	30H	***8***	30H	***9***	30H	***10***	30H					
						•						
						•						
						•						
						•						
						•		***569***	30H	***570***	30H	
571	30H	***572***	30H	***573***	30H	***574***	30H	***575***	30H	***576***	30H	

Nibble mode												
1	00H	***2***	00H	***3***	00H	***4***	00H	***5***	00H	***6***	00H	
7	00H	***8***	00H	***9***	07H	***10***	E0H					
						•						
						•						
						•						
						•						
						•		***281***	00H	***282***	00H	
283	00H	***284***	00H	***285***	00H	***286***	00H	***287***	00H	***288***	00H	

[Nibble mode]

(1) The writable character data to be stored is separated into four dot units and sent in the following order (***1*** → ***576***). (High order digit: "3")

(2) The data of writable characters to be stored is 30H to 3FH.

(3) The data count of writable characters to be stored should be 576 bytes.

[Hex. mode]

(1) The writable character data to be stored is separated into eight dot units and sent in the following order (***1*** → ***288***).

(2) The data of writable characters to be stored is 00H to FFH.

(3) The data count of writable characters to be stored should be 288 bytes.

* When writable character 44 is designated, the width and height of the character are both 48 dots.

Notes

(1) No matter what character set or character code is selected, no memory will be wasted.

(2) When a new writable character is stored, the Flash Memory Card Format Command ([ESC] J1) or the ATA Card Format Command ([ESC] JA) must be transmitted.

(3) A character code already stored can be stored in the flash memory card again if the Bit Map Writable Character Command ([ESC] XD) is transmitted, but memory will be consumed with every storage. Memory can be efficiently used by sending the Memory Card Format Command ([ESC] J1) before storing.

(4) If a flash memory card is used, and a label issue operation is performed after sending the Bit Map Writable Character Command ([ESC] XD), the image buffer is automatically cleared.

(5) When the storing operation stops after storing the writable character and logos, the printer automatically enters the online mode (label issue operation) after about 10 seconds. In this case, when the flash memory card is used, the image buffer is automatically cleared.

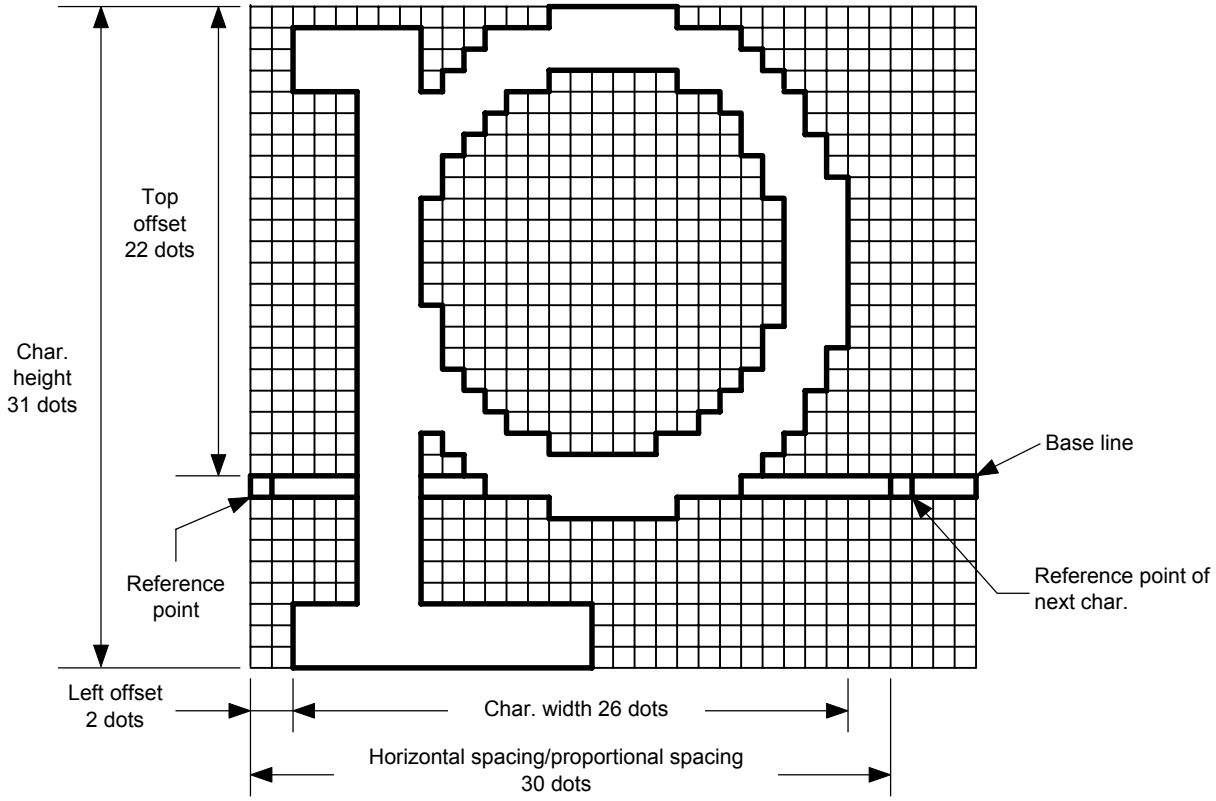
(6) Only a 4-MB flash memory card manufactured by Maxell can be used for storing a writable character.

Refer to

Memory Card Format Command (for flash memory card) ([ESC] J1)
Memory Card Format Command (for ATA card) ([ESC] JA)

Examples

Writable character set: 03
Writable character code: 70H



[ESC] J1; C [LF] [NUL]
[ESC] XD; 03, p, 002, 022, 026, 031, 030, 0, 000?<000?<7??800?<???<00?=?03>001?
<00?001?8007001?0007801>0003801>0003<01<0001<01<0001<01<0001<01<0001<01<0001<01>0
001<01>0003<01>0003801?0007801?800?001?<01?001=?07>001<???<001<7??8001<0?<
0001<0000001<0000001<0000001<000000???<0000???<0000???<0000 [LF] [NUL]

* 30H = ”0”
  31H = ”1”
  32H = ”2”
  33H = ”3”
  34H = ”4”
  35H = ”5”
  36H = ”6”
  37H = ”7”
  38H = ”8”
  39H = ”9”
  3AH = ”:”
  3BH = ”;”
  3CH = ”<”
  3DH = ”=”
  3EH = ”>”
  3FH = ”?”

6.3.22 Graphic Command [ESC] SG

Function Draws graphic data.

Format
[ESC] SG; aaaa, bbbb, cccc, dddd, e, ggg --- ggg [LF] [NUL]
or
[ESC] SG0; aaaa, bbbb, cccc, dddd, e, ffff, ggg --- ggg [LF] [NUL]

Term

aaaa: Print origin of X-coordinate for drawing graphic data
Fixed as 4 digits (in 0.1 mm units)

bbbb: Print origin of Y-coordinate for drawing graphic data
4 or 5 digits (in 0.1 mm units)

cccc: No. of graphic width dots
Fixed as 4 digits (in dots)
However, when the graphic data "2: BMP file" or "6: PCX file" is selected, this designation is ignored. (The information of the graphic width is contained in the graphic data.)

dddd: No. of graphic height dots
4 or 5 digits (in dots)
However, when the graphic data "2: BMP file" or "6: PCX file" is selected, this designation is ignored. (The information of the graphic height is contained in the graphic data.)
When "3: TOPIX compression mode" is selected for the type of graphic data:
Resolution of graphic data: *only two types
0150: 150 DPI (The data is drawn in double resolution.)
0300: 300 DPI (The data is drawn in single resolution.)

e: Type of graphic data
[ESC] SG; -- command:

0:	Nibble mode (4 dots/byte)	Overwrite drawing
1:	Hex. mode (8 dots/byte)	Overwrite drawing
2:	BMP file mode	Overwrite drawing
3:	TOPIX compression mode	Overwrite drawing
4:	Nibble mode (4 dots/byte)	OR drawing
5:	Hex. mode (8 dots/byte)	OR drawing
6:	PCX file mode	Overwrite drawing

[ESC] SG0; -- command:

A:	Printer driver compression mode	Overwrite drawing

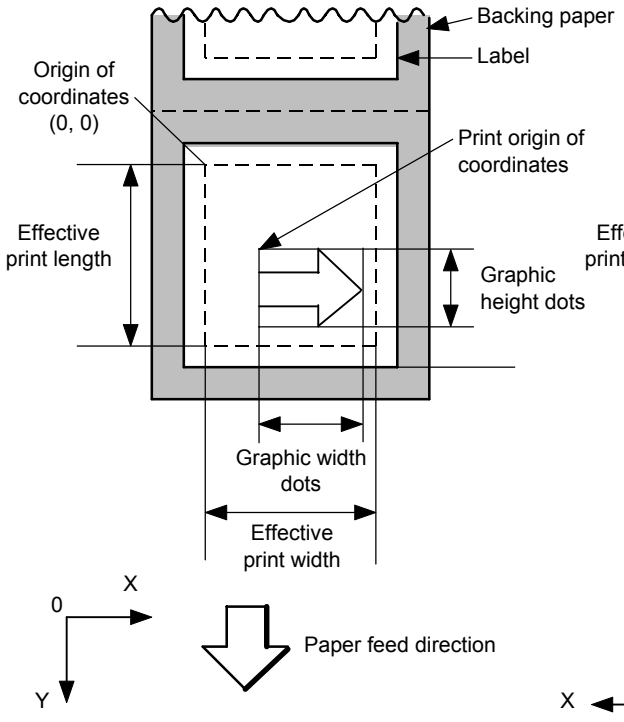
ffff: Data count (Effective only for [ESC] SG0; -- command)
Fixed as 4 digits
Represents the total number of bytes for the compressed graphic data by 32 bits in Hex.
Range: 0 to 4,294,967,295 bytes
(00H, 00H, 00H, 00H to FFH, FFH, FFH, FFH)

ggg --- ggg: Graphic data

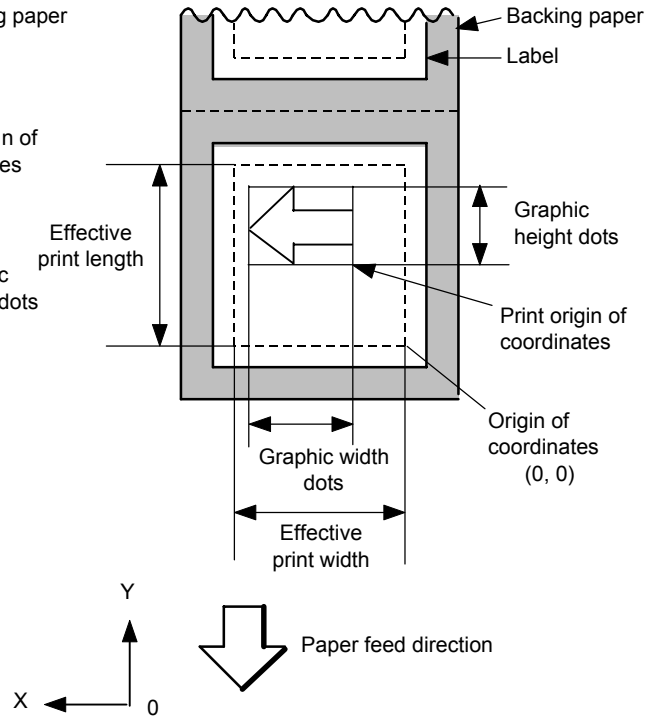
Explanation

(1) When the graphic data “0”, “1”, “2”, “3”, “6”, or “A” is selected, the graphic data is drawn by overwriting the image buffer.

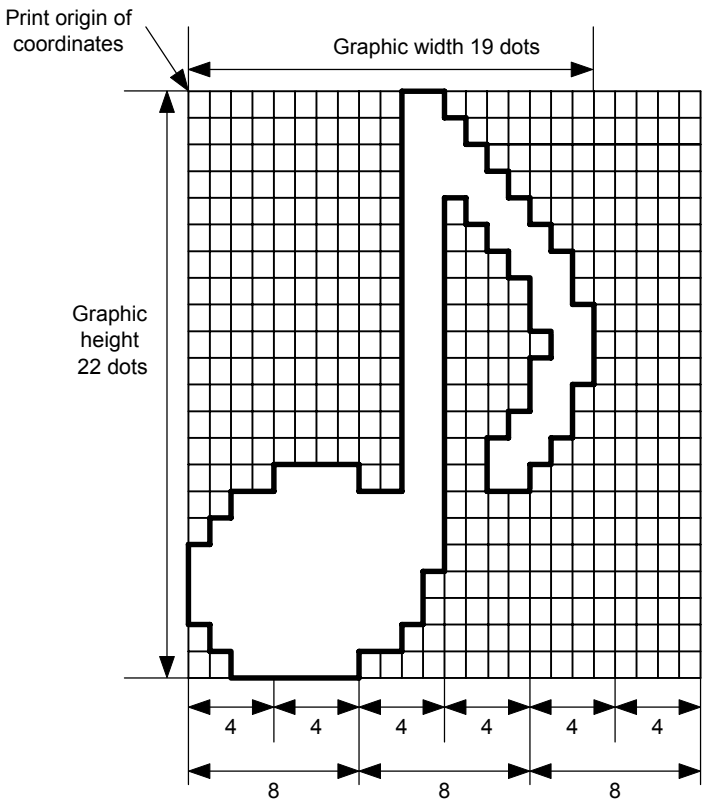
(2) When the graphic data “4” or “5” is selected, the graphic data is drawn by carrying out OR between the graphic data and the data in the image buffer.



[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:
Graphic data count = {(No. of graphic width dots + 7)/8} × No. of graphic height dots × 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***).

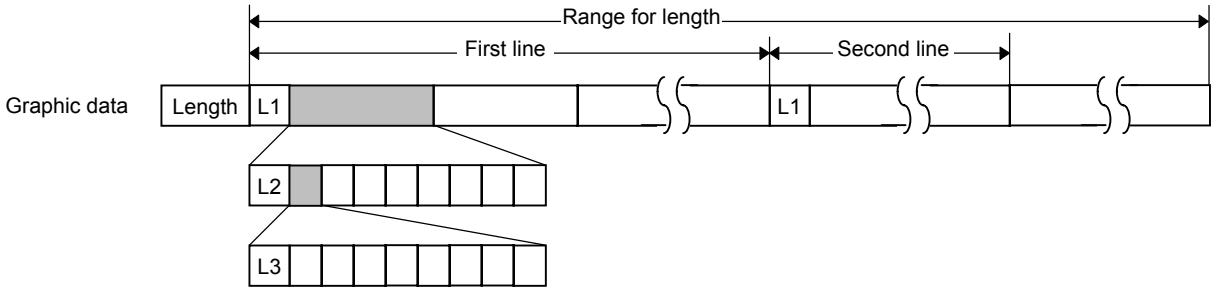
(2) The graphic data is 00H to FFH.

(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:
Graphic data count = {(No. of graphic width dots + 7)/8} × No. of graphic height dots

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

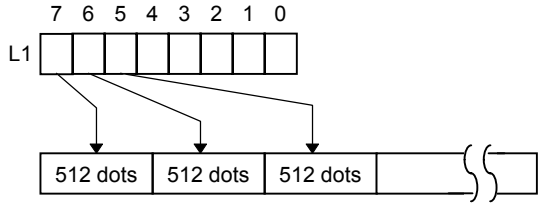
[When TOPIX compression mode is selected:]



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

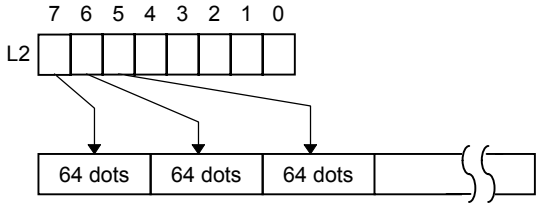
Ex. Length = 20 bytes: 00 14

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



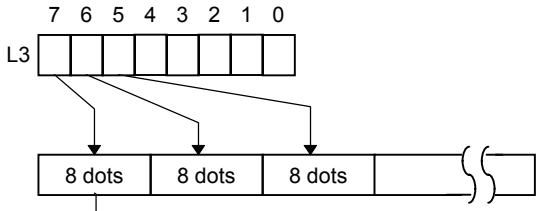
0: Not present
1: Present

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



0: Not present
1: Present

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



0: Not present
1: Present

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).

[When the printer driver compression mode is selected:]

(1) For the [ESC] SG0; -- command, only “A: Printer driver compression mode” can be selected for the type of graphic data. The parameter for the data count is attached after the parameter for the type of graphic data. When the total count of compressed data cannot be provided by the printer driver, “00H, 00H, 00H, 00H” should be specified for the graphic data count. However, in this case, the printer diver cannot support printing through a serial interface (RS-232C).

(2) How to compress data

Compression is performed for every data of one line specified for the number of graphic width dots.
The data is made up in units of 8 dots. A repeated value is encoded in 2 bytes. The first byte is a numeric value “n” indicating that a value is repeated (-n + 1) times.
The range is between -127 and -1. The second byte is the repeated value.
If a value is not repeated, the first byte is the numeric value “m”. The length of the values is indicated in (m+1). The range of “m” is between 0 and 126. The length of the repetition of the value and “m” should not exceed 127 and 126, respectively.
If it exceeds the range, it should be divided into blocks of repetition.
When the same contents as the data for 1 line appear repeatedly in the next line and after, the number of lines in which the same contents appear is encoded in 2 bytes. The first byte is fixed as 127. The second byte indicates “N” times that the same contents are repeated. Its range is between 1 and 255. “N” should not exceed 255. If it exceeds the range, the data for the excess number of times should be compressed as the new data of 1 line, and the remaining number of repetitions should be encoded.

[Example]

Data before being compressed (Width: 120 dots, Height: 300 lines)

Line No.	Graphic data
1	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh
2	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh
⋮	⋮
299	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh
300	AAh AAh AAh AAh AAh AAh AAh BBh CCh DDh EEh FFh FFh FFh FFh

Data after being compressed

Line No.	Graphic data
1	FAh AAh 03h BBh CCh DDh EEh FEh FFh
2 to 256	7FH FFH
257	FAh AAh 03h BBh CCh DDh EEh FEh FFh
258 to 300	7FH 2BH

FEh = -2
-(-2) + 1 = 3
FFh is repeated 3 times.

03h = 3
3 + 1 = 4
4-byte data (BBh CCh DDh EEh) without repetition

FAh = -6
-(-6) + 1 = 7
AAh is repeated 7 times.

Notes

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

(2) The number of graphic width dots and the number of graphic height dots must also be set so that the result of drawing the graphic data will be within the effective print area set by the Label Size Set Command ([ESC] D) in the same manner as the above.

(3) Both width and height are 11.8 dots/mm.

(4) The actual result of drawing may deviate within ±0.33 mm in the X direction with respect to the designated print origin of the X-coordinate.

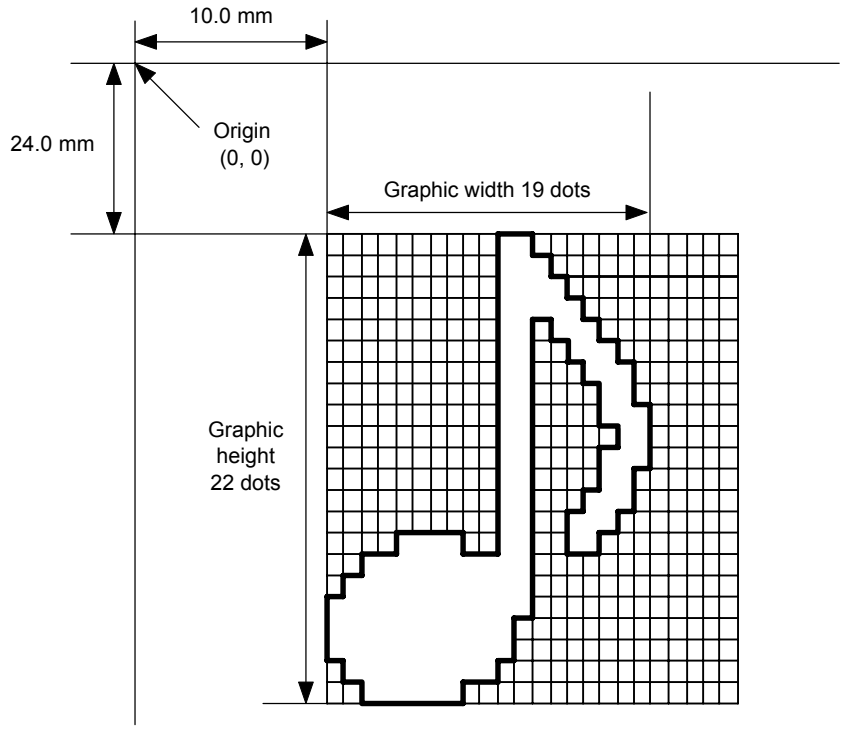
(To draw the received graphic data at high speed, the data is directly developed in the image buffer without applying correction to each bit with respect to the designated X-coordinate. Consequently, an error of up to 4 bits occurs.)

[Effective print area] [mm]

Item \ Model		Method	B-850		
			Batch issue	Cut issue	Strip issue for auto labeler *1
Effective print width		Min.	10.0	10.0	10.0
		Max.	216.8	216.8	216.8
Effective print length	Label	Min.	11.0	23.0	21.4
		Max.	640.0	640.0	640.0
	Tag	Min.	13.0	23.4	23.4
		Max.	640.0	640.0	640.0

"1: To perform the strip issue for the auto labeler, the backing paper rewind system and the control unit are required on the auto labeler as external equipment.

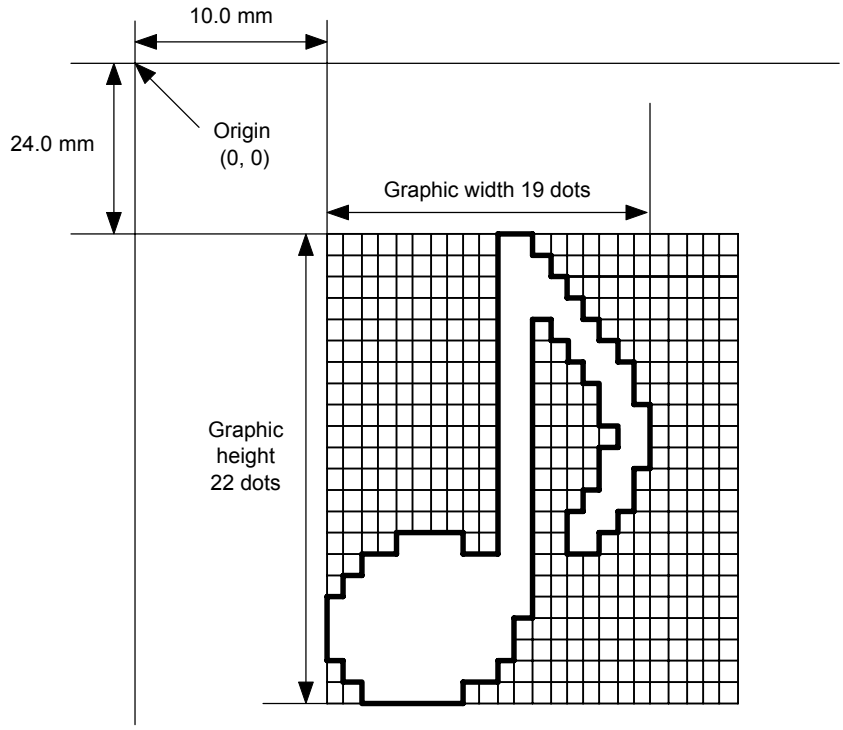
Examples



[ESC] C [LF] [NUL]
[ESC] SG; 0100, 0240, 0019, 0022, 0, 003000003800003<00003>000037000033800031
<00030<00030>00030600030>00030<00031<00033800?33003??0007??000???000??
>000??>0007? <0003?0000 [LF] [NUL]
[ESC] XS; I, 0001, 0002C4000 [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 = “?”

[TOPIX compression mode]



[ESC] SG; 0100, 0240, 0019, 0300, 3, 00 5C 80 80 40 30
Length L1 L2 L3 Data (1st line)

80 80 40 08 (2nd line) 80 80 40 04 (3rd line) 80 80 40 02 (4th line) 80 80 40 09 (5th line)

80 80 60 04 80 (6th line) 80 80 60 02 40 (7th line) 80 80 40 01 (8th line) 80 80 20 20 (9th line)

80 80 20 80 (10th line) 80 80 20 80 (11th line) 80 80 20 20 (12th line) 80 80 40 01 (13th line)

80 80 60 02 40 (14th line) 80 80 A0 0F 80 (15th line) 80 80 C0 30 C3 (16th line) 80 80 80 40 (17th line)

80 80 80 80 (18th line) 80 80 40 10 (19th line) 00 (20th line) 80 80 C0 80 20 (21st line) 80 80 C0 40 C0 (22nd line) [LF] [NUL]

6.3.23 Save Start Command [ESC] XO, [ECS] XV

Function

Declares the start of saving PC interface commands.
(Places the printer in the mode where PC interface commands are written in the ATA card, flash ROM on the CPU board, or the flash memory card.)

Format

For flash memory card or flash ROM on the CPU board:
[ESC] XO; aa, (Sb,) c [LF] [NUL]

For ATA card:
[ESC] XV; ddddddd, b, c [LF] [NUL]

Term

aa: Identification number to be used for saving in the flash memory card or flash ROM on the CPU board, or calling
01 to 99

ddddddd: Identifier to be used for saving in the ATA card or calling
File name using from 1 to 8 characters

Available characters:
A to Z: A to Z (in both upper and lower case)
0 to 9: Numerals from 0 to 9
Symbols: !, “, #, $, %, &, ‘,), (, -, ^, _, {, }, ~

Sb: Drive in which the PC interface command is stored
(Omissible in the command for the flash memory card ([ESC] XO). If omitted, flash ROM on the CPU board is selected.)

b: Drive
0: Flash ROM on the CPU board
(It can be specified in [ECS] XO only.)
1: Slot 1 on the PCMCIA board (Option)
2: Slot 2 on the PCMCIA board (Option)

c: Status response at save time
0: No status response made
1: Status response made

Explanation

(1) When the PC interface command is stored in the ATA card, directory “PCSAVE” is created, and then the “Specified file name. PCS” is created under the “PCSAVE” directory level.

Notes

(1) After sending the Save Start Command ([ESC] XO, [ESC] XV), any command other than the following will be saved into the ATA card or the flash memory card without being analyzed.

- Save Start Command ([ESC] XO, [ESC] XV)
- Save Terminate Command ([ESC] XP)
- Saved Data Call Command ([ESC] XQ, [ESC] XT)
- Bit Map Writable Character Command ([ESC] XD, [ESC] XA)
- Reset Command ([ESC] WR)
- Status Request Command ([ESC] WS)
- Memory Card Format Command ([ESC] J1, [ESC] JA)

(2) No error check is made for the commands at save time.

Refer to

- Save Terminate Command ([ESC] XP)
- Memory Card Format Command ([ESC] J1, [ESC] JA)

Examples

[ESC] J1; B [LF] [NUL]
[ESC] XO; 01, 0 [LF] [NUL]
[ESC] D0508, 0760, 0468 [LF] [NUL]
[ESC] T20C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0200, 0125, 1, 1, A, 00, B [LF] [NUL]
[ESC] PC002; 0650, 0550, 2, 2, G, 33, B, +0000000001 [LF] [NUL]
[ESC] XP [LF] [NUL]

6.3.24 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 is automatically cleared.
Refer to	Save Start Command ([ESC] XO, [ESC] XV)

6.3.25 Saved Data Call Command [ESC] XQ, [ESC] XT

Function Calls PC interface commands saved in the flash memory card or the ATA card.

Format

For flash memory card:

[ESC] XQ; aa, (Sb,) c, d [LF] [NUL]

For ATA card:

[ESC] XT; ddddddddd, b, c, d [LF] [NUL]

Term

aa: Identification number of the file to be called from the flash memory card
01 to 99

ddddddddd: Identifier for the file to be called from the ATA card
File name within 8 characters

Sb: Drive from which the command is called

(Omissible in the command for the flash memory card ([ESC] XQ). If omitted, the flash ROM on the CPU board is selected.)

b: Drive
0: Flash ROM on the CPU board
1: Slot 1 on the PCMCIA board (Option)
2: Slot 2 on the PCMCIA board (Option)

c: Status response when the saved data is called
0: No status response made
1: Status response made

d: Auto call at power on time
L: Auto call
M: No auto call

Notes

(1) If the relevant save identifier is not found, an error will result.

(2) However, if no save identifier 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

- Save Start Command ([ESC] XO, [ESC] XV)
- Save Terminate Command ([ESC] XP)

Examples

[ESC] XQ; 01, 0, L [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 100 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]

6.3.26 Head Broken Dots Check Command [ESC] HD

Function Checks the thermal head for broken dots.

Format [ESC] HD001 (, c) [LF] [NUL] ..... All broken dots check
[ESC] HD003, $a_1a_1a_1a_1$, $b_1b_1b_1b_1$, $a_2a_2a_2a_2$, $b_2b_2b_2b_2$,--- $a_8a_8a_8a_8$, $b_8b_8b_8b_8$ (, c) [LF] [NUL]
..... Partial broken dots check

Term c: Check result status response (Omissible)
A: Status response made
(If omitted, the check result status response is not made.)

$a_1a_1a_1a_1$ --- $a_8a_8a_8a_8$: Start coordinate of partition Fixed as 4 digits (in units of 0.1 mm)

$b_1b_1b_1b_1$ --- $b_8b_8b_8b_8$: End coordinate of partition Fixed as 4 digits (in units of 0.1 mm)

Explanation

(1) The Head Broken Dots Check Command is subject to batch processing. If the Issue Command for 100 labels is transmitted, followed by the Head Broken Dots Check Command, the head broken dots check will be executed after issuing 100 labels.

(2) If the check result is found to be normal when the check result status response is set so that it is not made, the next command is processed. If the check result is found to be abnormal, an error occurs. Whether or not the status is sent when an error occurs is determined according to the setting for the status response specified in the Issue Command.
If the check result is found to be normal when the check result status response is set to be made, a head broken dots check normal end status is sent, and then the next command is processed. If the check result is found to be abnormal, the head broken dots error status is sent, and then the printer stops.

Status for normal end
[SOH] [STX] “0020000” [EXT] [EOT] [CR] [LF]

Status for head broken dots error
[SOH] [STX] “1720000” [EXT] [EOT] [CR] [LF]

(3) All broken dots check takes approx. 3 seconds.

(4) Partial broken dots check
- Up to 8 positions for the range can be designated. However, the range is omissible if it is less than 8 positions.
- When the value set for the start coordinate is larger than the value set for the end coordinate, the end coordinate is recognized and processed as the start coordinate, and the start coordinate is recognized and processed as the end coordinate.
- Plural coordinates specifying the range can be designated at the same time.
- If a coordinate beyond the head width is specified, it is processed the same as the max. value designated. Therefore, a command error does not occur.

Examples
[ESC] C [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] RC002; 001 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
[ESC] HD001 [LF] [NUL]
[ESC] RC003; 002 [LF] [NUL]
[ESC] XS; I, 0002, 0002C4000 [LF] [NUL]
[ESC] HD003, 0100, 0500, 0600, 0800, 1000, 1100 [LF] [NUL]

6.3.27 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 normal 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 excess 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 is cleared.

(3) The following data can be displayed.

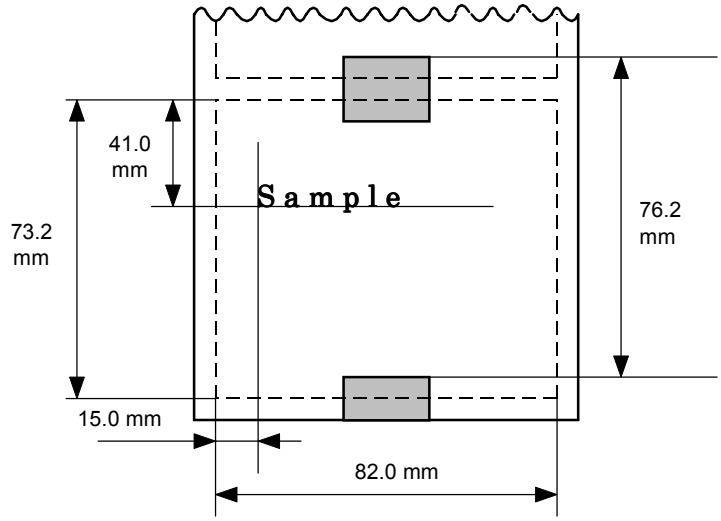
If anything other than the following data is received, "?" is displayed or a command error results.

	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	←				

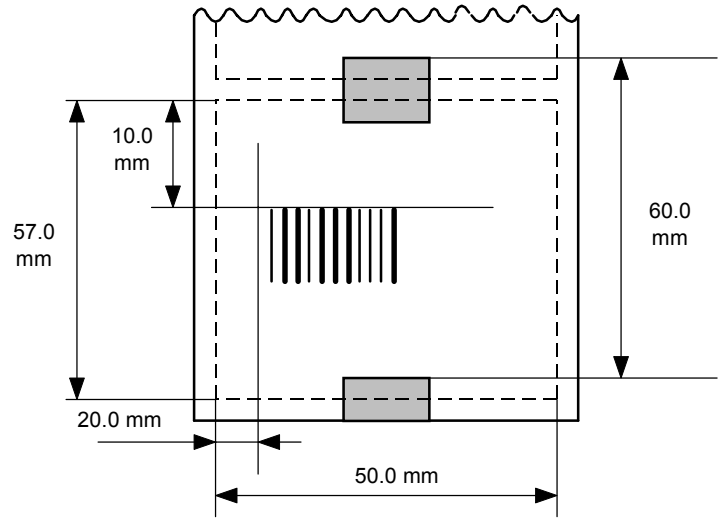
* The shaded parts are Japanese. They are omitted here.

Examples

① Load paper.
② Feed one label.
③ Issue 4 labels.



④ Message “Please set [Tag]” is displayed.
⑤ Change paper.
⑥ Press the [RESTART] key.
⑦ Feed one label.
⑧ Issue 2 labels.



[ESC] D0762, 0820, 0732 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] PC001; 0150, 0410, 1, 1, A, 00, B [LF] [NUL]
[ESC] RC001; Sample [LF] [NUL]
[ESC] XS; I, 0004, 0011C4001 [LF] [NUL]
[ESC] XJ; Please set [Tag] [LF] [NUL]
[ESC] D0600, 0500, 0570 [LF] [NUL]
[ESC] T11C40 [LF] [NUL]
[ESC] C [LF] [NUL]
[ESC] XB01; 0200, 0100, 3, 1, 03, 03, 08, 08, 03, 0, 0150 [LF] [NUL]
[ESC] RB01; 12345 [LF] [NUL]
[ESC] XS; I, 0002, 0011C4001 [LF] [NUL]

6.3.28 Reset Command [ESC] WR

Function Returns the printer to its initial state.

Format [ESC] WR [LF] [NUL]

Explanation The printer is returned to the same state as when the power is turned on. When the printer receives this command during printing, it returns to its initial state after issuing the label which is being printed. The next command must not be sent while the printer is performing initial processing (approximately 0.5 seconds) after this command is transmitted.

Notes

(1) The Reset Command is effective in serial interface (RS-232C) only. In parallel interface (Centronics), the reset request signal (nInit) should be used.

(2) When the printer receives a command in the system mode, only the Reset Command can be processed and any other command cannot be processed.

(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 the system mode.

(4) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Reset Command is not processed until the printer receives the data specified for the type of data.

Example [ESC] WR [LF] [NUL]

6.3.29 Status Request Command [ESC] WS

Function Sends the printer status to the host.

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

(1) The Status Request Command is effective in the serial interface (RS-232C) only. Since the status cannot be sent in the parallel interface (Centronics), this command is not supported.

(2) After the code of the Bit Map Writable Character Command ([ESC] XD) or Graphic Command ([ESC] SG) is received, the Status Request Command is not processed until the printer receives the data specified for the type of data.

(3) A max. delay of 20 msec may occur until the printer sends the status after receiving the Status Request Command.

(4) The interval from when the Status Request Command is sent to when the next Status Request Command is sent, should be 20 msec or more. If the interval is less than 20 msec, the printer may fail to receive the Status Request Command.

Example [ESC] WS [LF] [NUL]

6.3.30 Version Information Acquire Command [ESC] WV

Function Sends information such as the program version of the printer.

Format [ESC] WV [LF] [NUL]

Explanation (1) The format of the program version data (total 27 bytes of data) to be returned to the host is as follows:

SOH		01H
STX		02H
Creation date	"0"	30H
	"4"	34H
	"A"	41H
	"P"	50H
	"R"	52H
	"1"	31H
	"9"	39H
	"9"	39H
	"8"	38H
Model	"B"	42H
	"-"	2DH
	"8"	38H
	"5"	35H
	"0"	30H
	SP	20H
	SP	20H
Version	"V"	56H
	"1"	31H
	"."	2EH
	"0"	30H
	"A"	41H
ETX		03H
EOT		04H
CR		0DH
LF		0AH

Creation date of program:
9 bytes of data indicated in order of Day-Month-Year

Model:
7 bytes of ASCII code indicating model

Program version:
5 bytes of data: Vx.xx
Revision
Version

(2) This command is one of the types of commands that is processed as it is received. Processing takes place starting from the ones received first. Until the process of the command previously sent is completed, the next command is not processed. Therefore, if the printer is not in the idle state when this command is sent, the program version data may not be returned immediately.

Notes (1) This command is effective only for the serial interface (RS-232C).
This command is not supported for a parallel interface (Centronics) since transmission cannot be performed in the parallel interface.

6.3.31 ATA Card Information Acquire Command [ESC] WI

Function Sends information regarding the use of the ATA card to the host.

Format [ESC] WI; a, b [LF] [NUL]

Term

a: Drive
- 1: Slot 1 ATA card
- 2: Slot 2 ATA card

b: Information to be acquired
- A: Free space
- B: Writable character list
- C: Stored PC command save file

Explanation (1) The format of information to be returned to the host is as follows:

A: Free space

SOH	STX	"A"	Slot	Free space (Kbyte)						ETX	EOT	CR	LF
01H	02H	41H	xxH	3xH	3xH	3xH	3xH	3xH	3xH	03H	04H	0DH	0AH

Free space (in units of Kbytes):
000000 (KB) to 999999 (KB)

Slot:
"1" (31H): Slot 1
"2" (32H): Slot 2

When the ATA card is not inserted into a specified slot, "00H, 00H, 00H, 00H, 00H, 00H" is returned for the free spaces.

B: Writable character list

SOH	STX	"B"	Slot	Storage information for writable character (55 bytes)					ETX	EOT	CR	LF
01H	02H	42H	xxH	"0"/"1"	"0"/"1"	·····	"0"/"1"	"0"/"1"	03H	04H	0DH	0AH

Writable character No. 55

Writable character No. 54

Writable character No. 02

Writable character No. 01
"0" (30H): Not stored
"1" (31H): Stored

Slot
"1" (31H): Slot 1
"2" (32H): Slot 2

If only one writable character is stored, information of the writable character No. is set to "1" (Stored). The storage information of a specified character code can be acquired by using the ATA Card Writable Character Information Acquire Command ([ESC] WG).
The storage information for the writable character has a total of 55 bytes. The writable character No. is assigned from 01 to 44, and from 51 to 55. Therefore, bytes to which Nos. 45 to 50 are assigned are sure to be set to "0" (30H). When the ATA card is not inserted in the specified slot, "00H" for the storage information for the writable character is returned.

C: Stored PC command save file

SOH	STX	"C"	Slot	Stored PC command save file name	ETX	EOT	CR	LF
01H	02H	43H	xxH	File name 1 00H File name 2 00H ··· File name n 00H	03H	04H	0DH	0AH

Slot:
"1" (31H): Slot 1
"2" (32H): Slot 2

File name (including extension):
"00H" should be placed between file names.

In the following cases, 1 byte of "00H" is returned as the stored PC command save file name.

① There is no file.
② The ATA card is not inserted in the specified slot.

(2) This command is one of the types of commands that is processed as it is received. Processing takes place starting from the ones received first. Until the process of the command previously sent is completed, this command is not processed. Therefore, if the printer is not in the idle state when this command is sent, the data may not be returned immediately.

Note

(1) This command is effective only for the serial interface (RS-232C).
This command is not supported for a parallel interface (Centronics), since transmission cannot be performed in the parallel interface.

6.3.32 ATA Card Writable Character Information Acquire Command [ESC] WG

Function Sends the writable character information stored in the ATA card to the host.

Format [ESC] WG; a, bb, cc [LF] [NUL]

Term

a: Drive
- 1: Slot 1 ATA card
- 2: Slot 2 ATA card

bb: Writable character set
01 to 44, 51 to 55

cc: Writable character code
If there is a 1-byte writable character, “00H” should be attached to the upper digit of the data to make it 2 bytes.

Explanation (1) The format of information to be returned to the host is as follows:

SOH	STX	“D”	Slot	Writable character set		Character code		Storage	ETX	EOT	CR	LF
01H	02H	44H	3xH	3xH	3xH	xxH	xxH	“0”/“1”	03H	04H	0DH	0AH

Storage of writable character
“0”: Not stored
“1”: Stored

Character code (described in 2 bytes)
If there is a 1-byte writable character, “00H” is attached to the upper digit of the data.

Writable character set
“01” (30H, 31H) to “44” (34H, 34H)
“51” (35H, 31H) to “55” (35H, 35H)

Slot
“1” (31H): Slot 1
“2” (32H): Slot 2

When the ATA card is not inserted in a specified slot, “00H” is returned for all information from “Writable Character Set” to “Storage” (5 bytes).

Example When the following information in the ATA card is Slot 1 is acquired:

Writable character set 44, writable character code 41H

[ESC] WG; 1, 44, (0x00) (0x41) [LF} [NUL]

* (0x00) represents data of 00H.
* (0x41) represents data of 41H.

6.3.33 IP Address Set Command [ESC] IP

Function Sets the IP address to be required for the network connection.

Format [ESC] IP; a, bbb, ccc, ddd, eee [LF] [NUL]

Term

a: IP address to be set
- 2: Printer IP address (Initial value: 192.168.10.20)
- 3: Gateway IP address (Initial value: 0.0.0.0)
- 4: Subnet mask (Initial value: 255.255.255.0)

bbb: First 8 bits: 000 to 255

ccc: Second 8 bits: 000 to 255

ddd: Third 8 bits: 000 to 255

eee: Last 8 bits: 000 to 255

Explanation The IP address setting can also be made in the system mode. The most recent setting is used.

Example Sets the printer IP address to “157.69.9.78”.

[ESC] IP; 2, 157, 069, 009, 078 [LF] [NUL]

6.3.34 Socket Communication Port Set Command [ESC] IS

Function Enables or disables the socket communication, and sets the communication port number to be used.

Format [ESC] IS; a, bbbbb [LF] [NUL]

Term

a: 0: Socket communication is disabled.
1: Socket communication is enabled.

bbbbb: Port number (It must be set in 5 digits.)
00000 to 65535

Explanation These settings can also be made in the system mode. The setting which was last made takes effect.

Example To enable the socket communication and set the port number to “8000”.

[ESC] IS; 1, 08000 [LF] [NUL]

6.4 COMMANDS FOR SYSTEM ADMINISTRATOR

6.4.1 Parameter Set Command [ESC] Z2; 1

Function — Sets each parameter on the printer.

Format — [ESC] Z2; 1, abcdefghkjjkllmmnnopqqrstuv [LF] [NUL]

Term

a: Character code selection
- 0: PC-850
- 1: PC-852
- 2: PC-857
- 3: PC-8
- 4: PC-851
- 5: PC-855
- 6: PC-1250
- 7: PC-1251
- 8: PC-1252
- 9: PC-1253
- A: PC-1254
- B: PC-1257
- C: LATIN9
- D: Arabic

b: Font “0” selection
- 0: 0 (without slash)
- 1: Ø (with slash)

c: RS-232C communication speed
- 0: 2400 bps
- 1: 4800 bps
- 2: 9600 bps
- 3: 19200 bps

d: RS-232C data length
- 0: 7 bits
- 1: 8 bits

e: RS-232C parity check
- 0: NONE
- 1: EVEN
- 2: ODD

f: RS-232C transmission control

0: XON/XOFF protocol
(No XON output when the power is turned on, no XOFF output when the power is turned OFF)

1: READY/BUSY (DTR) protocol
(No XON output when the power is turned on, no XOFF output when the power is turned OFF)

2: XON/XOFF + READY/BUSY (DTR) protocol:
(XON output when the power is turned on, XOFF output when the power is turned OFF)

3: XON/XOFF protocol:
(XON output when the power is turned on, XOFF output when the power is turned OFF)

4: RTS protocol
(No XON output when the power is turned on, no XOFF output when the power is turned OFF)

g: Language for LCD messages

0: ENGLISH
1: GERMAN
2: FRENCH
3: DUTCH
4: SPANISH
5: JAPANESE
6: ITALIAN

h: Forward feed standby after an issue

0: OFF (Not performed)
1: ON (Performed)

i: Indicates the direction in which the fine adjustment of the stop position of forward feed is to be made.

+: Performs the forward feed with the length longer than the current value
-: Performs the forward feed with the length shorter than the current value

jj: Fine adjustment value for the stop position of the forward feed
00 to 50 (in units of 0.1 mm) [*1]

k: Type of control code

0: Automatic selection
1: ESC, LF, NUL mode
2: {, |, } mode
3: Any set code

ll: 1st byte code of the control code [*2]
"00" to "FF" (Specify the hex code in 2 bytes of ASCII code) [*3]

mm: 2nd byte code of the control code [*2]
"00" to "FF" (Specify the hex code in 2 bytes of ASCII code) [*3]

nn: 3rd byte code of the control code [*2]
"00" to "FF" (Specify the hex code in 2 bytes of ASCII code) [*3]

o: [FEED] key function
0: FEED: Feeds one label.
1: PRINT: Prints data of image buffer on one label.

p: Kanji code selection
0: TYPE 1
1: TYPE 2

qq: Euro code setting
"20" to "FF" (Specify the hex code in 2 bytes of ASCII code) *3

r: Automatic head broken dots check
0: OFF (When the power is turned on, the broken dots check is not automatically performed.)
1: ON (When the power is turned on, the broken dots check is automatically performed.)

s: Centronics ACK/BUSY timing setting
0: TYPE1
1: TYPE2

t: Web printer function setting
0: OFF (Web printer function is disabled.)
1: ON (Web printer function is enabled.)

u: Silent printing function setting
1: ON Silent printing function is enabled.)

v: Keyboard (KB-80) connection setting
0: OFF (The KB-80 is not connected.)
1: ON (The KB-80 is connected.)

Explanation

(1) This command is not executed until the printer enters an idle state.

(2) Except for some of them, the parameters set by this command become effective when the power is turned on or the Reset Command is sent.

*1: The value can be set in units of 0.1 mm. However, the value which is actually set on the printer, is in units of 0.5 mm. When a value from 0.0 mm to 0.4 mm is set, it is actually set on the printer as 0.0 mm. Also when a value from 0.5 mm to 0.9 mm is set, it is actually set on the printer as 0.5 mm.
This fine adjustment value is set on the printer only when the automatic forward feed standby after an issue is set to "ON". If it is set to "OFF", this value is discarded.

*2: This value is set on the printer only when "Any set code" is selected for the control code. If any value than "Any set code" is set, it is discarded.

*3: Specify the hex code to be set in 2 bytes of ASCII code as shown below:
Example 1: To set 36H: "36" (33H, 36H)
Example 2: To set 42H: "42" (34H, 32H)
Example 3: To set FFH: "FF" (46H, 46H)

6.4.2 Fine Adjustment Value Set Command [ESC] Z2; 2

Function Sets various fine adjustment values on the printer.

Format [ESC] Z2; 2, abbbcdddeffghhhijjkllmnnoppqqrr [LF] [NUL]

Term

a: Indicates the direction, forward or backward, in which a feed length fine adjustment is to be made.
- +: Backward
- -: Forward

bbb: Feed length fine adjustment value
000 to 500 (in units of 0.1 mm) *1

c: Indicates the direction, forward or backward, in which a cut position (or stop position of the strip issue) fine adjustment is to be made.
- +: Backward
- -: Forward

ddd: Fine adjustment value for the cut position (or stop position of the strip issue)
000 to 500 (in units of 0.1 mm) *1

e: Indicates whether the back feed is to be increased or decreased.
- +: Increase
- -: Decrease

ff: Back feed length fine adjustment value
00 to 95 (in units of 0.1 mm) *1

g: Indicates the direction, positive or negative, in which the X-coordinate fine adjustment is to be made.
- +: Positive direction
- -: Negative direction

hhh: X-coordinate fine adjustment value
000 to 995 (in units of 0.1 mm) *1

i: Indicates whether to increase or decrease the density in the thermal transfer print mode.
- +: Increase (darker)
- -: Decrease (lighter)

jj: Print density fine adjustment value (for the thermal transfer print mode)
00 to 10 (in units of 1 step)

k: Indicates whether to increase or decrease the density in the direct thermal print mode.
- +: Increase (darker)
- -: Decrease (lighter)

ll: Print density fine adjustment value (for the direct thermal print mode)
00 to 10 (in units of 1 step)

m: Fine adjustment direction for the ribbon rewind motor voltage
- -: Fixed as Negative (The voltage is lowered.)

nn: Fine adjustment value for the ribbon rewind motor voltage
00 to 15 (in units of 1 step)

o: Fine adjustment direction for the ribbon back tension motor voltage
+: Positive (The voltage is raised.)
-: Negative (The voltage is lowered.)

pp: Fine adjustment value for the ribbon back tension motor voltage
Fine adjustment direction is “+”:
00 to 10 (in units of 1 step)
Fine adjustment direction is “-”:
00 to 15 (in units of 1 step)

qq: Lower reflective sensor manual threshold fine adjustment value
00 to 40 (in units of 0.1 V)

rr: Transmissive sensor manual threshold fine adjustment value
00 to 40 (in units of 0.1 V)

Explanation

(1) This command is not executed until the printer enters an idle state.

(2) Except for some of them, the parameters set by this command become effective when the power is turned on or the Reset Command is sent.

*1: The value can be set in units of 0.1 mm. However, the value which is actually set on the printer, is in units of 0.5 mm. When a value from 0.0 mm to 0.4 mm is set, it is actually set on the printer as 0.0 mm. Also when a value from 0.5 mm to 0.9 mm is set, it is actually set on the printer as 0.5 mm.

6.4.3 Batch Reset Command [ESC] Z0 (zero)

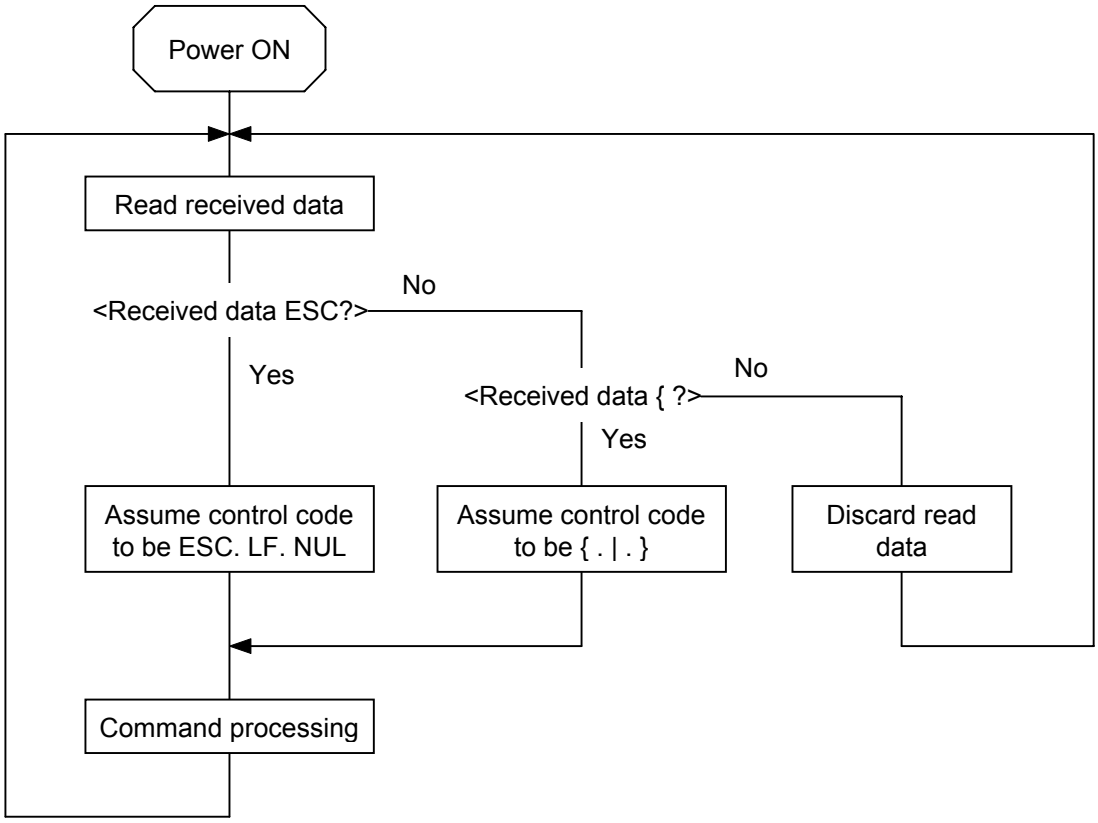
Function	Resets the printer.
Format	[ESC] Z0 [LF] [NUL]
Explanation	• This command is not executed until the printer enters an idle state.
	• Some values in the Parameter Set Command ([ESC] Z2;1) and Fine Adjustment Value Set Command ([ESC Z2;2]), will become effective when the printer is initialized. This command should be sent after the Parameter Set Command ([ESC] Z2;1) or Fine Adjustment Value Set Command ([ESC] Z2;2) is sent.

7. CONTROL CODE SELECTION

(1) Automatic Selection

This printer 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 the 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 the hexadecimal mode. { . | . } cannot be used in the data of the Data Command or Display Command.

(4) Manual Selection (Any set code)

The control code of the command is the code set in the system mode, and the control code selection is not performed. The code used in each command should not be set as a control code. In the Data Command or Display Command, the code set as 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 attempting to call a PC Save Command of a save identifier which is not saved, an error results. An undefined command is not detected as an error, and data is discarded until [NUL] or [}] is received.

(2) Hardware 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 hardware error occurs, the printer displays 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

• 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) Cutter Error

• When the cutter home position sensor does not detect 1.5 sec 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.
- The cutter cover is open.

(3) Label End

① When the transmissive sensor and lower reflective sensor detect the label end state in 3 mm continuously, an error will result.

② If the transmissive sensor and lower reflective sensor detect the label end state when an issue, feed, and ejection are attempted in a printer stop state, an error will result.

(4) 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 are attempted in a 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.

(5) Thermal Head Error

① A broken dot error has occurred in the thermal head.

② An error has occurred in the thermal head driver.

(6) Thermal Head Excessive Temperature

① When the open-air temperature detection thermistor detects an excessively high temperature, an error will result.

② When the thermal head temperature detection thermistor detects an excessively high temperature, an error will result.

③ When the heat sink sensor detects an excessively high temperature, an error will result.

④ In the direct thermal printing, if the thermal head temperature detection thermistor detects more than 65°C, the printer completes printing, then stops until the temperature becomes 65 °C or lower.

(7) Ribbon Error

When the ribbon is specified, and the motor speed calculated from the ribbon motor sensors (rewind/back tension) and rotation direction are out of specification, an error will result.

① Rotation of the ribbon motor (rewind) is too fast.

③ Rotation of the ribbon motor (rewind) is too slow, or the ribbon motor does not rotate.

③ The ribbon motor (back tension) does not rotate.

④ The ribbon motor (back tension) rotates in the reverse direction.

- The ribbon is not installed.
- A ribbon jam has occurred.
- The ribbon has been torn.
- An abnormal condition has occurred in the ribbon motor sensor.
- The ribbon has run out.

* At the moment an error occurs, the printer displays the error message, makes a status response, then stops. Only the Status Request Command and Reset Command can be processed, and other commands are not processed. Restoration using the [RESTART] key is possible except in the case of a thermal head excessive temperature error. (The printer resumes printing the label where the error occurred.)

8.3 ERRORS IN WRITABLE CHARACTER AND PC COMMAND SAVE MODES

(1) Write Error

• An error has occurred in writing in the flash memory card.

(2) Format Error

• An erase error has occurred in formatting the flash memory card.

(3) Memory Full

• Storing is impossible because of the insufficient flash memory capacity.

* At the moment when an error occurs, the printer displays the error message, makes status response, then stops. 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) Momentary Power Interruption Error

• A momentary power interruption has occurred.

(2) Address error

• A command has been fetched from an odd address.
• Word data has been accessed from a place other than the boundary of the word data.
• Long word data has been accessed from a place other than the boundary of the long word data.

(3) General invalid command exception

• An undefined command in a place other than the delay slot, has been decoded.

(4) Slot invalid exception

• An undefined command in the delay slot, has been decoded.
• A command which rewrites the data in the delay slot, has been decoded.

* At the moment when an error occurs, the printer displays the error message, makes status response, then stops. (None of the commands and key operations will be processed.)

(5) EEPROM Error

• The EEPROM for back-up cannot be read/written properly.

8.5 RESET PROCESSING

When the [RESTART] key is held down 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 when the printer feeds and completes an issue normally (Batch/cut mode: after the designated number of labels are printed, Strip mode for the auto labeler: After one label is printed). In the online mode, the head up/down status is sent to the host.

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

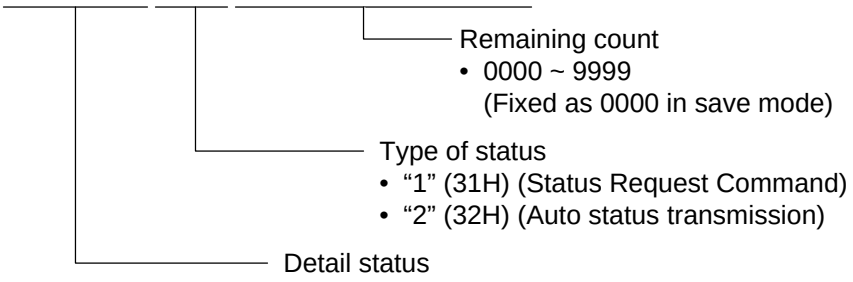
The remaining count in the status response indicates the remaining count of the batch currently being printed. No remaining count of the batch waiting to be printed is transmitted.

(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 state to the host, 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 when it is received.

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 ~~**~~**	Operating (Analyzing command, drawing, printing, or feeding)		–	02
PAUSE ****	In a pause state		–	04
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
HEAD OPEN ****	An attempt was made to feed or issue with the head open. (except the [FEED] key)		15	15
HEAD ERROR ****	A broken dot error has occurred in the thermal head.		17	17
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. The ribbon has run out.		21	21
ON LINE	The issue has been completed normally.		40	–
ON LINE	The feed has been completed normally.		41	–
SAVING ### &&&& **SAVING %%%%%%%**	In writable character or PC command save mode		–	55
FLASH WRITE ERR.	An error has occurred in writing data into the flash memory card.		50	50
FORMAT ERROR	An erase error has occurred in formatting the flash memory card.	Writable character, PC command, save mode	51	51
FLASH CARD FULL	Saving failed because of the insufficient capacity of the flash memory card.		54	54
Display of error message (See Note 1.)	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

LCD Message	Printer Status	Detail Status	
		Auto Status Transmission	Status Request Command
POWER FAILURE	A momentary power interruption has occurred.	–	–
EEPROM ERROR	An EEPROM for back up cannot be read/written properly.	–	–
SYSTEM ERROR	(a) A command has been fetched from an odd address. (b) Word data has been accessed from a place other than the boundary of the word data. (c) Long word data has been accessed from a place other than the boundary of the long word data. (d) An undefined command in a place other than the delay slot, has been decoded. (e) An undefined command in the delay slot, has been decoded. (f) A command which rewrites the data in the delay slot, has been decoded.	–	–

9.2 PARALLEL INTERFACE

9.2.1 Compatible Mode

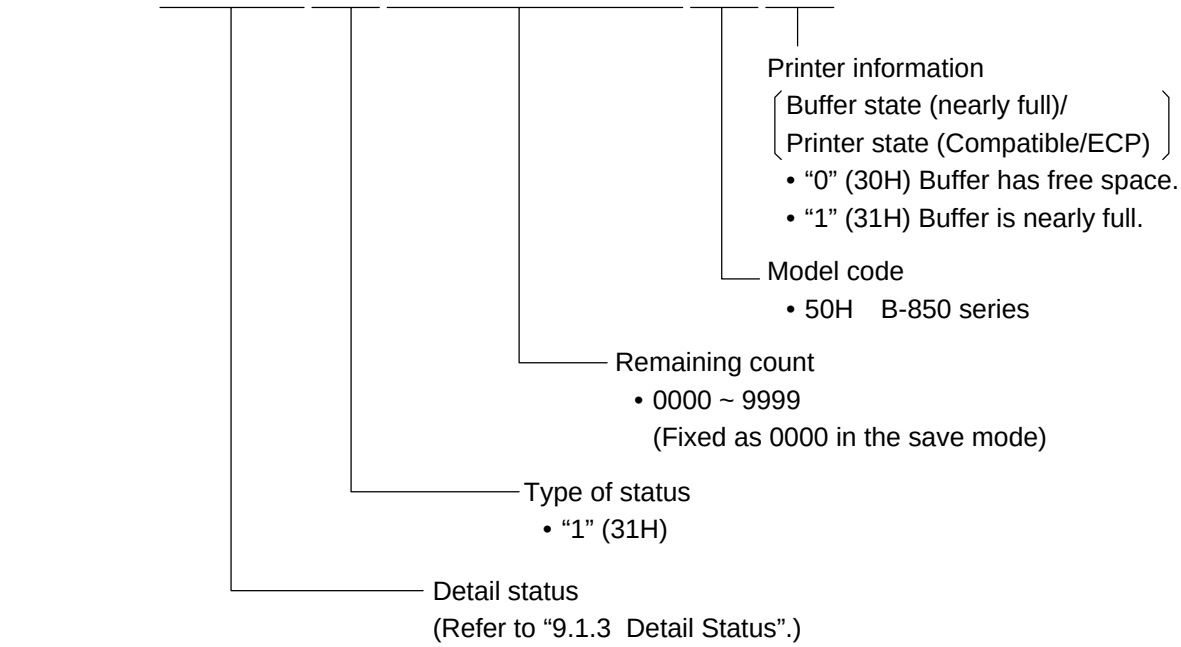
LCD Messages	Printer Status	Output Signal			
		Busy	Select	nFault	PError
ON LINE	In the online mode	L	H	H	L
ON LINE	In the online mode (communicating)	L, H	H	H	L
HEAD OPEN	The head was opened in the online mode.	H	L	L	L
PAUSE ****	In a pause state	H	L	L	L
ON LINE	Data was set from the host with the receive buffer full.	H	H	H	L
ON LINE	After data was sent 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 nInit 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
HEAD OPEN ****	A feed or an issue was attempted with the head opened. (except the [FEED] key)	H	L	L	L
HEAD ERROR	A broken dot error has occurred in the thermal head.	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. The ribbon has run out.	H	L	L	L
SAVING ### &&&& **SAVING %%%%%%%**	In writable character or PC command save mode	L	H	H	L
FLASH WRITE ERR.	An error has occurred in writing data into the flash memory card.	H	L	L	L
FORMAT ERROR	An erase error has occurred in formatting the flash memory card.	H	L	L	L
FLASH CARD FULL	Saving failed because of the insufficient capacity of the flash memory card.	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

LCD Messages	Printer Status	Output Signal			
		Busy	Select	nFault	PError
SYSTEM ERROR	(a) A command has been fetched from an odd address. (b) Word data has been accessed from a place other than the boundary of the word data. (c) Long word data has been accessed from a place other than the boundary of the long word data. (d) An undefined command in a place other than the delay slot, has been decoded. (e) An undefined command in the delay slot, has been decoded. (f) A command which rewrites the data in the delay slot, has been decoded.	H	L	L	L

9.2.2 Nibble Mode

Status Format

SOH	STX	Status			Remaining count				Model	State	CR	LF
01H	02H	3XH	3XH	3XH	3XH	3XH	3XH	3XH	xxH	3XH	0DH	0AH



9.3 E-MAIL

The printer can notify the host of the printer status (the same as a detailed status is notified when a serial interface is used) by e-mail.

* For details, refer to the Network Specification (TAA-1323).

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 PCL	○	○	●	In the online mode (In the PCL emulation mode)	–	Yes
	ON LINE KBD	○	○	●	In the online mode (The keyboard (KB-80) is connected.)	–	Yes
	ON LINE	○	⊙	●	In the online mode (Communicating)	–	Yes
2	**HEAD OPEN**	○	●	●	The head was opened in the online mode.	–	Yes
3	**PAUSE ******	○	●	●	In a pause state	Yes	Yes
4	**COMMS ERROR**	○	●	○	A parity error, overrun error, or framing error has occurred during communication 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	**HEAD OPEN ********	○	●	○	A feed or an issue was attempted with the head opened. (except the [FEED] key)	Yes	Yes
9	**HEAD ERROR**	○	●	○	A broken dot error has occurred in the thermal head.	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. The ribbon has run out.	Yes	Yes
12	**SAVING ### &&&&** **SAVING %%%%%%%**	○	○	●	In writable character or PC command save mode	-	Yes
13	**FLASH WRITE ERR.**	○	●	○	An error has occurred in writing data into the flash memory card.	No	Yes
14	**FORMAT ERROR**	○	●	○	An erase error has occurred in formatting the flash memory card.	No	Yes

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			
15	**FLASH CARD FULL**	○	●	○	Saving failed because of the insufficient capacity of the flash memory card.	No	Yes
16	Display of error command (See NOTE 1.)	○	●	○	A command error has occurred in analyzing the command.	Yes	Yes
17	**POWER FAILURE**	○	●	○	A momentary power interruption has occurred.	No	No
18	**EEPROM ERROR**	○	●	○	An EEPROM for back-up cannot be read/written properly.	No	No
19	**SYSTEM ERROR**	○	●	○	(a) A command has been fetched from an odd address. (b) Word data has been accessed from a place other than the boundary of the word data. (c) Long word data has been accessed from a place other than the boundary of the long word data. (d) An undefined command in a place other than the delay slot, has been decoded. (e) An undefined command in the delay slot, has been decoded. (f) A command which rewrites the data in the delay slot, has been decoded.	No	No

NOTE 1: If a command error is found in the command received, 16 bytes of the command in error, starting from the command code, will be displayed. (However, [LF] and [NUL] will not be displayed.)

[Example 1] [ESC] PC001; 0A00, 0300, 2, 2, A, 00, B [LF] [NUL]

Command error

LCD display

```
PC001;0A00,0300,
```

[Example 2] [ESC] T20 E40 [LF] [NUL]

Command error

LCD display

```
T20E40
```

[Example 3] [ESC] XR; 0200, 0300, 0450, 1200, 1 [LF] [NUL]

Command error

LCD display

```
XR;0200,0300,045
```

NOTE 2: When the error command is displayed, "? (3FH)" is displayed for codes other than 20H ~ 7FH and A0H ~ DFH.

NOTE 3: ○: On
⊙: Blinking
●: Off
****: Remaining label count ␣␣␣␣ ~ 9999 (in pieces)
%%%%%%%: Remaining memory capacity of ATA card: 0 to 9999999 (in K bytes)
###: Remaining memory capacity of PC save area of the flash memory card: 0 to 895 (in K bytes)
&&&&: Remaining memory capacity of writable character storage area of the flash memory card 0 to 3147 (in K bytes)

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	HEAD OPEN ****
9	HEAD ERROR
10	EXCESS HEAD TEMP
11	RIBBON ERROR****
12	SAVING ### &&&& SAVING %%%%%%%
13	FLASH WRITE ERR.
14	FORMAT ERROR
15	FLASH CARD FULL
16	POWER FAILURE
17	EEPROM ERROR
18	SYSTEM ERROR

No.	GERMAN
1	ON LINE
2	KOPF OFFEN
3	PAUSE ****
4	UEBERTR.-FEHLER
5	PAPIERSTAU ****
6	MESSERFEHL. ****
7	PAPIERENDE ****
8	KOPF OFFEN ****
9	KOPF DEFEKT
10	KOPF UEBERHITZT
11	FB-FEHLER ****
12	SP.-MOD ### &&&& SP.-MOD %%%%%%%
13	FLASH FEHLER
14	FORMATFEHLER
15	FLASH ZU KLEIN
16	POWER FAILURE
17	EEPROM ERROR
18	SYSTEM ERROR

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

No.	DUTCH
1	IN LIJN
2	KOP OPEN
3	PAUZE ****
4	COMM. FOUT
5	PAPIER VAST ****
6	SNIJMES FOUT****
7	PAPIER OP ****
8	KOP OPEN ****
9	PRINTKOP DEFECT
10	TEMP. FOUT
11	LINT FOUT ****
12	MEM ### &&&& MEM %%%%%%%
13	FLASH MEM FOUT
14	FORMAAT FOUT
15	GEHEUGEN VOL
16	POWER FAILURE
17	EEPROM ERROR
18	SYSTEM ERROR

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

No.	JAPANESE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	

* 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	TESTA APERTA****
9	ERROR TESTA
10	TEMP. TESTA ALTA
11	ERR. NASTRO ****
12	SALVA ### &&&& SALVA %%%%%%%
13	ERR.SCRITT.CARD
14	ERR. FORMATTAZ.
15	MEM. CARD PIENA
16	POWER FAILURE
17	EEPROM ERROR
18	SYSTEM ERROR

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 later.

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

(Bit map font type: A, B, C, D, E, F, G, H, I, J, K, L, N, O, P, Q, R)

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	₠			α	≡
1			!	1	A	Q	a	q	ü	æ	í				β	±
2			"	2	B	R	b	r	é	Æ	ó				Γ	≥
3			#	3	C	S	c	s	â	ô	ú				π	≤
4			$	4	D	T	d	t	ä	ö	ñ				Σ	⌠
5			%	5	E	U	e	u	à	ò	Ñ				σ	⌡
6			&	6	F	V	f	v	å	û	ª				µ	÷
7			'	7	G	W	g	w	ç	ù	º				τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿				Φ	°
9			)	9	I	Y	i	y	ë	Ö	⌐				Θ	•
A			*	:	J	Z	j	z	è	Ü	¬				Ω	•
B			+	;	K	[	k	{	ï	¢	½				δ	√
C			,	<	L	\	l	|	î	£	¼				∞	ⁿ
D			–	=	M	]	m	}	ì	¥	¡				∅	²
E			.	>	N	^	n	~	Ä	Pt	«				ε	■
F			/	?	O	_	o	▒	Å	∫	»				∩	

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	╧			Ó	-
1			!	1	A	Q	a	q	ü		í			Đ	ß	
2			”	2	B	R	b	r	é		ó				Ô	
3			#	3	C	S	c	s	â	ô	ú			Ë		
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u				Á				§
6			&	6	F	V	f	v				Â		Í		÷
7			’	7	G	W	g	w	ç					Î		¸
8			(	8	H	X	h	x								°
9			)	9	I	Y	i	y	ë	Ö					Ú	¨
A			*	:	J	Z	j	z		Ü	¬					•
B			+	;	K	[	k	{								
C			,	<	L	\	l	|	î					ý	
D			–	=	M	]	m	}							Ý	
E			.	>	N	^	n	~	Ä	×	«					■
F			/	?	O	_	o	▒			»		¤			

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(4) PC-857

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(5) PC-851

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç			₹€				
1			!	1	A	Q	a	q	ü							±
2			”	2	B	R	b	r	é							
3			#	3	C	S	c	s	â	ô						
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u	à							§
6			&	6	F	V	f	v		û						
7			’	7	G	W	g	w	ç	ù						¸
8			(	8	H	X	h	x	ê							°
9			)	9	I	Y	i	y	ë	Ö						¨
A			*	:	J	Z	j	z	è	Ü						
B			+	;	K	[	k	{	Ï		½					
C			,	<	L	\	l	|	î	£					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o	▒			»					

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(6) PC-855

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(7) PC-1250

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±	Á		á	
2			”	2	B	R	b	r					Â		â	
3			#	3	C	S	c	s						Ó		ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶		Ö		ö
7			’	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸				
9			)	9	I	Y	i	y			©		É		é	
A			*	:	J	Z	j	z						Ú		ú
B			+	;	K	[	k	{			«	»	Ë		ë	
C			,	<	L	\	l	|			¬			Ü		ü
D			–	=	M	]	m	}					Í	Ý	í	ý
E			.	>	N	^	n	~			®		Î		î	
F			/	?	O	_	o	▒						ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(8) PC-1251

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			"	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶				
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y			©					
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~			®					
F			/	?	O	_	o	▒								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(9) PC-1252

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(10) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			"	2	B	R	b	r				²				
3			#	3	C	S	c	s	*ƒ*		£	³				
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u			¥	µ				
6			&	6	F	V	f	v			¦	¶				
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x			¨					
9			)	9	I	Y	i	y			©					
A			*	:	J	Z	j	z			ª					
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}				½				
E			.	>	N	^	n	~			®					
F			/	?	O	_	o	▒								

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(11) PC-1254

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(12) PC-1257

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			"	2	B	R	b	r			¢	²				
3			#	3	C	S	c	s			£	³		Ó		ó
4			$	4	D	T	d	t			¤	´	Ä		ä	
5			%	5	E	U	e	u				µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶		Ö		ö
7			'	7	G	W	g	w			§	·		×		÷
8			(	8	H	X	h	x			Ø	ø				
9			)	9	I	Y	i	y			©	¹	É		é	
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬	¼		Ü		ü
D			–	=	M	]	m	}	¨	¯		½				
E			.	>	N	^	n	~			®	¾				
F			/	?	O	_	o	▒	¸		Æ	æ		ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(13) LATIN9

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(14) Arabic

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

12.2 PRESENTATION (Bit map font type: M)

(1) PC-850, PC-857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				-
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~				¥				
F			/	?	O	_	O	▒								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}		¥						
E			.	>	N	^	N	~								
F			/	?	O	_	O									

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				-
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 Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U								
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(5) PC-1252, PC-1254

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U			¥					
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X	^	~						
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(6) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€				-
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T								
5			%	5	E	U	E	U			¥					
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(7) LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	P				€̶				
1			!	1	A	Q	A	Q								
2			"	2	B	R	B	R								
3			#	3	C	S	C	S								
4			$	4	D	T	D	T			€̶					
5			%	5	E	U	E	U			¥̶					
6			&	6	F	V	F	V								
7			'	7	G	W	G	W								
8			(	8	H	X	H	X								
9			)	9	I	Y	I	Y								
A			*	:	J	Z	J	Z								
B			+	;	K	[	K	{								
C			,	<	L	\	L	|								
D			–	=	M	]	M	}								
E			.	>	N	^	N	~								
F			/	?	O	_	O	▌								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

12.3 OCR-A (Bit map font type: S)

(1) PC-850, PC-857

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	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	ｳ	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	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	ｳ	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	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 Japanese message is selected in the system mode, code 5CH indicates “¥”.

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	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 Japanese message is selected in the system mode, code 5CH indicates “¥”.

(5) PC-1252, PC-1254

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	ｱ	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	ｿ								
F			/	?	O	ｳ	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(6) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	ｱ	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	ｿ								
F			/	?	O	ｳ	o	▉								

When Japanese message is selected in the system mode, code 5CH indicates "¥".

(7) LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	｢	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 Japanese message is selected in the system mode, code 5CH indicates “¥”.

12.4 OCR-B (Bit map font type: T)

(1) PC-850, PC-857

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(2) PC-8

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(3) PC-852

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(4) PC-851, PC-855, PC-1250, PC-1251, PC-1257, Arabic

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(5) PC-1252, PC-1254, LATIN9

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

(6) PC-1253

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

When Japanese message is selected in the system mode, code 5CH indicates "¥".

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

12.5 TEC OUTLINE FONT 1 (Outline font type: A, B)

(1) PC-850

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	₹				-
1			!	1	A	Q	a	q	ü	æ	í	€			ß	±
2			”	2	B	R	b	r	é	Æ	ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö	ñ				õ	
5			%	5	E	U	e	u	à	ò	Ñ					§
6			&	6	F	V	f	v	å	û	ª		ã		µ	÷
7			’	7	G	W	g	w	ç	ù	º					
8			(	8	H	X	h	x	ê	ÿ	¿					°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü	¬					•
B			+	;	K	[	k	{	ï	ø	½					
C			,	<	L	\	l	|	î	£	¼				
D			–	=	M	]	m	}	ì	Ø	¡	¢				²
E			.	>	N	^	n	~	Ä		«	¥				■
F			/	?	O	_	o	△	Å	ƒ	»		¤			

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

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€			α	≡
1			!	1	A	Q	a	q	ü	æ	í	€			β	±
2			"	2	B	R	b	r	é	Æ	ó				Γ	≥
3			#	3	C	S	c	s	â	ô	ú				π	≤
4			$	4	D	T	d	t	ä	ö	ñ				Σ	⌠
5			%	5	E	U	e	u	à	ò	Ñ				σ	⌡
6			&	6	F	V	f	v	å	û	ª				µ	÷
7			'	7	G	W	g	w	ç	ù	º				τ	≈
8			(	8	H	X	h	x	ê	ÿ	¿				Φ	°
9			)	9	I	Y	i	y	ë	Ö					Θ	•
A			*	:	J	Z	j	z	è	Ü	¬				Ω	•
B			+	;	K	[	k	{	ï	¢	½				δ	√
C			,	<	L	\	l	|	î	£	¼			∞	n
D			–	=	M	]	m	}	ì	¥	¡				∅	2
E			.	>	N	^	n	~	Ä	Pt	«				ε	■
F			/	?	O	_	o	△	Å	∫	»				∩	

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

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	₹€				-
1			!	1	A	Q	a	q	ü		í	₹€			ß	
2			”	2	B	R	b	r	é		ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u								§
6			&	6	F	V	f	v								÷
7			’	7	G	W	g	w	ç							
8			(	8	H	X	h	x								°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z		Ü	¬					•
B			+	;	K	[	k	{								
C			,	<	L	\	l	|	î							
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o	△			»		¤			

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

(4) PC-857

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

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

(5) PC-851

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç			€				
1			!	1	A	Q	a	q	ü			€				±
2			"	2	B	R	b	r	é							
3			#	3	C	S	c	s	â	ô						
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u	à							§
6			&	6	F	V	f	v		û						
7			'	7	G	W	g	w	ç	ù						
8			(	8	H	X	h	x	ê							°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü						
B			+	;	K	[	k	{	Ï		½					
C			,	<	L	\	l	|	î	£						
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o	△			»					

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

(6) PC-855

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

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

(7) PC-1250

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€			á	
2			"	2	B	R	b	r							â	
3			#	3	C	S	c	s								ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v						Ö		ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y					É		é	
A			*	:	J	Z	j	z								ú
B			+	;	K	[	k	{			«	»			ë	
C			,	<	L	\	l	|			¬			Ü		ü
D			–	=	M	]	m	}							í	
E			.	>	N	^	n	~							Î	
F			/	?	O	_	o	△						ß		

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

(8) PC-1251

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

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

(9) PC-1252

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

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

(10) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r				²				
3			#	3	C	S	c	s	ƒ		£					
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u			¥	µ				
6			&	6	F	V	f	v								
7			'	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z			ª					
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}				½				
E			.	>	N	^	n	~								
F			/	?	O	_	o	△								

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

(11) PC-1254

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€			à	
1			!	1	A	Q	a	q			¡	€		Ñ	á	ñ
2			"	2	B	R	b	r			¢	²			â	ò
3			#	3	C	S	c	s	ƒ		£				ã	ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u			¥	µ	Å		å	õ
6			&	6	F	V	f	v					Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x	^	~				Ø	è	ø
9			)	9	I	Y	i	y					É		é	ù
A			*	:	J	Z	j	z			ª	º			ê	ú
B			+	;	K	[	k	{			«	»			ë	û
C			,	<	L	\	l	|			¬	¼		Ü	ì	ü
D			–	=	M	]	m	}				½			í	
E			.	>	N	^	n	~							î	
F			/	?	O	_	o	△				¿		ß	Ï	ÿ

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

(12) PC-1257

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				€				
2			"	2	B	R	b	r			¢	²				
3			#	3	C	S	c	s			£					ó
4			$	4	D	T	d	t			¤		Ä		ä	
5			%	5	E	U	e	u				µ	Å		å	õ
6			&	6	F	V	f	v						Ö		ö
7			'	7	G	W	g	w			§	·				÷
8			(	8	H	X	h	x			Ø	ø				
9			)	9	I	Y	i	y					É		é	
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬	¼		Ü		ü
D			–	=	M	]	m	}				½				
E			.	>	N	^	n	~								
F			/	?	O	_	o	△			Æ	æ		ß		

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

(13) LATIN9

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€			à	
1			!	1	A	Q	a	q			¡	€		Ñ	á	ñ
2			"	2	B	R	b	r			¢	²			â	ò
3			#	3	C	S	c	s			£				ã	ó
4			$	4	D	T	d	t			¤		Ä		ä	ô
5			%	5	E	U	e	u			¥	µ	Å		å	õ
6			&	6	F	V	f	v					Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç		ç	÷
8			(	8	H	X	h	x						Ø	è	ø
9			)	9	I	Y	i	y					É		é	ù
A			*	:	J	Z	j	z			ª	º			ê	ú
B			+	;	K	[	k	{			«	»			ë	û
C			,	<	L	\	l	|			¬			Ü	ì	ü
D			–	=	M	]	m	}							í	
E			.	>	N	^	n	~							î	
F			/	?	O	_	o					¿		ß	Ï	ÿ

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

(14) Arabic

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

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

12.6 PRICE FONT 1, 2, 3 (Outline font type: E, F, G)

(1) All types of character codes

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	円											-
1				1												
2				2												
3				3												
4			$	4												
5			%	5												
6				6												
7				7												
8				8												
9				9												
A																
B																
C			,			¥										
D			–													
E			.					~								
F			/													

12.7 TEC OUTLINE FONT 2, 3 (Outline font type: H, I)

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(2) PC-8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	€				
1			!	1	A	Q	a	q	ü	æ	í					±
2			”	2	B	R	b	r	é	Æ	ó					
3			#	3	C	S	c	s	â	ô	ú					
4			$	4	D	T	d	t	ä	ö	ñ					
5			%	5	E	U	e	u	à	ò	Ñ					
6			&	6	F	V	f	v	å	û	ª				µ	÷
7			’	7	G	W	g	w	ç	ù	º					
8			(	8	H	X	h	x	ê	ÿ	¿					°
9			)	9	I	Y	i	y	ë	Ö						
A			*	:	J	Z	j	z	è	Ü	¬					•
B			+	;	K	[	k	{	ï	¢	½					
C			,	<	L	\	l	|	î	£	¼				
D			–	=	M	]	m	}	ì	¥	¡					²
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o		Å	ƒ	»					

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(3) PC-852

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç	É	á	≠€		đ	Ó	-
1			!	1	A	Q	a	q	ü	Ĺ	í			Đ	ß	˝
2			”	2	B	R	b	r	é	Í	ó			Ď	Ô	˛
3			#	3	C	S	c	s	â	ô	ú			Ë	Ń	ˇ
4			$	4	D	T	d	t	ä	ö	Ą			ď	ń	˘
5			%	5	E	U	e	u	ů	Ľ	ą	Á		Ň	ň	§
6			&	6	F	V	f	v	ć	Ǐ	Ž	Â	Ă	Í	Š	÷
7			’	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
8			(	8	H	X	h	x	ł	ś	Ę	Ş		ě	Ŕ	°
9			)	9	I	Y	i	y	ë	Ö	ę				Ú	¨
A			*	:	J	Z	j	z	Ő	Ü	¬				ŕ	•
B			+	;	K	[	k	{	ő	Ť	ź				Ű	ű
C			,	<	L	\	l	|	î	ť	Č				ý	Ř
D			–	=	M	]	m	}	Ź	Ł	ş	Ż		Ţ	Ý	ř
E			.	>	N	ˆ	n	~	Ä	×	«	ż		Ů	ţ	■
F			/	?	O	_	o		Ć	č	»		¤			

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(4) PC-857

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(5) PC-851

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p	Ç			€				
1			!	1	A	Q	a	q	ü							±
2			”	2	B	R	b	r	é							
3			#	3	C	S	c	s	â	ô						
4			$	4	D	T	d	t	ä	ö						
5			%	5	E	U	e	u	à							§
6			&	6	F	V	f	v		û						
7			’	7	G	W	g	w	ç	ù						¸
8			(	8	H	X	h	x	ê							°
9			)	9	I	Y	i	y	ë	Ö						¨
A			*	:	J	Z	j	z	è	Ü						
B			+	;	K	[	k	{	ï		½					
C			,	<	L	\	l	|	î	£					
D			–	=	M	]	m	}								
E			.	>	N	^	n	~	Ä		«					■
F			/	?	O	_	o				»					

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(6) PC-855

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(7) PC-1250

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€	Ŕ	Đ	ŕ	ð
1			!	1	A	Q	a	q			˘	±	Á	Ń	á	ń
2			”	2	B	R	b	r			ˇ	˛		Ñ	â	ň
3			#	3	C	S	c	s			Ł	ł		Ó		ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			Ą	µ	Ĺ	Ő	Í	ő
6			&	6	F	V	f	v			¦	¶	Ć	Ö	ć	ö
7			’	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9			)	9	I	Y	i	y				ą	É	Ů	é	ů
A			*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B			+	;	K	[	k	{	Ś	ś	«	»	Ë	Ű	ë	ű
C			,	<	L	\	l	|	Ť	ť	¬	Ľ	Ě	Ü	ě	ü
D			–	=	M	]	m	}			-	˝	Í	Ý	í	ý
E			.	>	N	^	n	~	Ž	ž	®	Ľ	Î	Ţ	î	ţ
F			/	?	O	_	o	Ż	Ź	ź		ż	Ď	ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(8) PC-1251

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			”	2	B	R	b	r								
3			#	3	C	S	c	s								
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶				
7			’	7	G	W	g	w			§	·				
8			(	8	H	X	h	x								
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z								
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬					
D			–	=	M	]	m	}			-					
E			.	>	N	^	n	~			®					
F			/	?	O	_	o									

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(9) PC-1252

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(10) PC-1253

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€				
1			!	1	A	Q	a	q				±				
2			”	2	B	R	b	r				²				
3			#	3	C	S	c	s	*ƒ*		£	³				
4			$	4	D	T	d	t			¤					
5			%	5	E	U	e	u				µ				
6			&	6	F	V	f	v			¦	¶				
7			’	7	G	W	g	w			§	·				
8			(	8	H	X	h	x			¨					
9			)	9	I	Y	i	y								
A			*	:	J	Z	j	z			ª					
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|		¬					
D			–	=	M	]	m	}			-	½				
E			.	>	N	^	n	~			®					
F			/	?	O	_	o									

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(11) PC-1254

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(12) PC-1257

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				€	Ą	Š	ą	š
1			!	1	A	Q	a	q				±		Ń		ń
2			”	2	B	R	b	r				²				
3			#	3	C	S	c	s			£	³	Ć	Ó	ć	ó
4			$	4	D	T	d	t			¤	´	Ä		ä	
5			%	5	E	U	e	u				µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Ę	Ö	ę	ö
7			’	7	G	W	g	w			§	·		×		÷
8			(	8	H	X	h	x			Ø	ø	Č		č	
9			)	9	I	Y	i	y				¹	É	Ť	é	ť
A			*	:	J	Z	j	z					Ź	Ś	ź	ś
B			+	;	K	[	k	{			«	»				
C			,	<	L	\	l	|			¬	¼		Ü		ü
D			–	=	M	]	m	}	¨	¯	-	½		Ż		ż
E			.	>	N	^	n	~	˘	¸	®			Ž		ž
F			/	?	O	_	o		˛		Æ	æ		ß		

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(13) LATIN9

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

(14) Arabic

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

When Japanese message is selected in the system mode, code 5CH indicates “¥”.

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

12.8 TrueType FONT

(1) PC-850

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

(2) PC-8

	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	▓	┴	╤	ß	±
2	"	2	B	R	b	r	é	Æ	ó	▓	┬	╥	Γ	≥
3	#	3	C	S	c	s	â	ô	ú	│	├	╙	π	≤
4	$	4	D	T	d	t	ä	ö	ñ	┤	—	╘	Σ	⌠
5	%	5	E	U	e	u	à	ò	Ñ	╡	┼	╒	σ	⌡
6	&	6	F	V	f	v	å	û	ª	╢	╞	╓	µ	÷
7	'	7	G	W	g	w	ç	ù	º	╖	╟	╫	τ	≈
8	(	8	H	X	h	x	ê	ÿ	¿	╕	╚	╪	Φ	°
9	)	9	I	Y	i	y	ë	Ö	⌐	╣	╔	┘	Θ	·
A	*	:	J	Z	j	z	è	Ü	¬	‖	╩	┌	Ω	·
B	+	;	K	[	k	{	ï	¢	½	╗	╦	▓	δ	√
C	,	<	L	\	l	|	î	£	¼	╝	╠	▬	∞	n
D	-	=	M	]	m	}	ì	¥	¡	╜	═	▌	φ	²
E	.	>	N	^	n	~	Ä	Pt	«	╛	╬	▐	ϵ	■
F	/	?	O	_	o	⌂	Å	ƒ	»	┐	╧	▓	∩	

(3) PC-852

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	É	á	▒	└	đ	Ó	-
1	!	1	A	Q	a	q	ü	Ĺ	í	▓	┴	Đ	ß	´
2	"	2	B	R	b	r	é	Í	ó	▓	┬	Ď	Ô	˛
3	#	3	C	S	c	s	â	ô	ú	|	├	Ë	Ń	ˇ
4	$	4	D	T	d	t	ä	ö	Ą	┤	—	ď	ń	˘
5	%	5	E	U	e	u	ů	Ľ	ą	Á	┼	Ň	ň	§
6	&	6	F	V	f	v	ć	ľ	Ž	Â	Ă	Í	Š	÷
7	'	7	G	W	g	w	ç	Ś	ž	Ě	ă	Î	š	¸
8	(	8	H	X	h	x	ł	ś	Ę	Ş	╚	č	Ř	°
9	)	9	I	Y	i	y	ë	Ö	ę	╣	╔	┘	Ú	¨
A	*	:	J	Z	j	z	Ő	Ü		‖	╩	┌	ř	·
B	+	;	K	[	k	{	ő	Ť	ź	╗	╦	■	Ű	ű
C	,	<	L	\	l	|	î	ť	Č	╝	╠	▄	ý	Ř
D	-	=	M	]	m	}	Ź	Ł	ş	Ż	═	Ţ	Ý	ř
E	.	>	N	^	n	~	Ä	×	«	ż	╬	Ů	ţ	■
F	/	?	O	_	o	⌂	Ć	č	»	┐	¤	▀	´	

(4) PC-857

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

(5) PC-851

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ç	Ί	ï	▒	└	T	ζ	-
1	!	1	A	Q	a	q	ü		ΐ	▓	┴	Y	η	±
2	"	2	B	R	b	r	é	Ό	ό	▀	┬	Φ	θ	υ
3	#	3	C	S	c	s	â	ô	ύ	|	├	X	ι	φ
4	$	4	D	T	d	t	ä	ö	A	┤	—	Ψ	κ	χ
5	%	5	E	U	e	u	à	Ύ	B	K	┼	Ω	λ	§
6	&	6	F	V	f	v	Ά	û	Γ	Λ	Π	α	μ	ψ
7	'	7	G	W	g	w	ç	ù	Δ	M	P	β	ν	¸
8	(	8	H	X	h	x	ê	Ώ	E	N	╚	γ	ξ	°
9	)	9	I	Y	i	y	ë	Ö	Z	╣	╔	┘	o	¨
A	*	:	J	Z	j	z	è	Ü	H	‖	╩	┌	π	ω
B	+	;	K	[	k	{	ï	ά	½	╗	╦	■	ρ	ϋ
C	,	<	L	\	l	|	î	£	Θ	╝	╠	▄	σ	ΰ
D	-	=	M	]	m	}	Έ	έ	I	Ξ	═	δ	ς	ώ
E	.	>	N	^	n	~	Ä	ή	«	O	╬	ε	τ	▪
F	/	?	O	_	o	⌂	Ή	ί	»	┐	Σ	▬	΄	

(6) PC-855

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	ђ	љ	a	▒	└	л	Я	-
1	!	1	A	Q	a	q	Ђ	Љ	А	▓	┴	Л	р	ы
2	"	2	B	R	b	r	ѓ	њ	б	▀	┬	м	Р	Ы
3	#	3	C	S	c	s	Ѓ	Њ	Б	|	├	М	с	з
4	$	4	D	T	d	t	ё	ћ	ц	┤	—	н	С	З
5	%	5	E	U	e	u	Ё	Ћ	Ц	х	┼	Н	т	ш
6	&	6	F	V	f	v	є	ќ	д	Х	к	о	Т	Ш
7	'	7	G	W	g	w	Є	Ќ	Д	и	К	О	у	э
8	(	8	H	X	h	x	s	ў	е	И	╚	п	У	Э
9	)	9	I	Y	i	y	S	Ў	Е	╣	╔	┘	ж	щ
A	*	:	J	Z	j	z	i	ц	ф	‖	╩	┌	Ж	Щ
B	+	;	K	[	k	{	I	Ц	Ф	╗	╦	■	в	ч
C	,	<	L	\	l	|	ї	ю	г	╝	╠	▄	В	Ч
D	-	=	M	]	m	}	Ї	Ю	Г	й	═	П	ь	§
E	.	>	N	^	n	~	j	ъ	«	Й	╬	я	Ь	▪
F	/	?	O	_	o	⌂	J	Ъ	»	┐	¤	▬	№	

(7) PC-1250

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	€			°	Ŕ	Đ	ŕ	đ
1	!	1	A	Q	a	q		‘	ˇ	±	Á	Ń	á	ń
2	"	2	B	R	b	r	,	’	˘	˛	Â	Ň	â	ň
3	#	3	C	S	c	s		“	Ł	ł	Ă	Ó	ă	ó
4	$	4	D	T	d	t	„	”	¤	´	Ä	Ô	ä	ô
5	%	5	E	U	e	u	…	•	Ą	µ	Ĺ	Ő	Í	ő
6	&	6	F	V	f	v	†	–	¦	¶	Ć	Ö	ć	ö
7	'	7	G	W	g	w	‡	—	§	·	Ç	×	ç	÷
8	(	8	H	X	h	x			¨	¸	Č	Ř	č	ř
9	)	9	I	Y	i	y	‰	™	©	ą	É	Ů	é	ů
A	*	:	J	Z	j	z	Š	š	Ş	ş	Ę	Ú	ę	ú
B	+	;	K	[	k	{	‹	›	«	»	Ë	Ű	ë	ű
C	,	<	L	\	l	|	Ś	ś	¬	Ľ	Ě	Ü	ě	ü
D	-	=	M	]	m	}	Ť	ť	-	˝	Í	Ý	í	ý
E	.	>	N	^	n	~	Ž	ž	®	ľ	Î	Ţ	î	ţ
F	/	?	O	_	o	▩	Ź	ź	Ż	ż	Ď	ß	ď	˙

(8) PC-1251

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	Ђ	ђ		°	А	Р	а	р
1	!	1	A	Q	a	q	Ґ	‘	Ў	±	Б	С	б	с
2	"	2	B	R	b	r	,	’	ў	І	В	Т	в	т
3	#	3	C	S	c	s	ґ	“	Ј	і	Г	У	г	у
4	$	4	D	T	d	t	„	”	¤	г	Д	Ф	д	ф
5	%	5	E	U	e	u	…	•	Ґ	µ	Е	Х	е	х
6	&	6	F	V	f	v	†	–	¦	¶	Ж	Ц	ж	ц
7	'	7	G	W	g	w	‡	—	§	·	З	Ч	з	ч
8	(	8	H	X	h	x	€		Ё	ё	И	Ш	и	ш
9	)	9	I	Y	i	y	‰	™	©	№	Й	Щ	й	щ
A	*	:	J	Z	j	z	Љ	љ	Є	є	К	Ъ	к	ъ
B	+	;	K	[	k	{	‹	›	«	»	Л	Ы	л	ы
C	,	<	L	\	l	|	Њ	њ	¬	j	М	Ь	м	ь
D	-	=	M	]	m	}	Ќ	ќ	-	S	Н	Э	н	э
E	.	>	N	^	n	~	Ћ	ћ	®	s	О	Ю	о	ю
F	/	?	O	_	o	▩	Џ	џ	Ї	ї	П	Я	п	я

(9) PC-1252

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

(10) PC-1253

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	€			°	ΐ	Π	ΰ	π
1	!	1	A	Q	a	q		‘	΅	±	A	P	α	ρ
2	"	2	B	R	b	r	,	’	Ά	²	B		β	ς
3	#	3	C	S	c	s	*f*	“	£	³	Γ	Σ	γ	σ
4	$	4	D	T	d	t	„	”	¤	′	Δ	T	δ	τ
5	%	5	E	U	e	u	…	•	¥	µ	E	Y	ε	υ
6	&	6	F	V	f	v	†	–	¦	¶	Z	Φ	ζ	φ
7	'	7	G	W	g	w	‡	—	§	·	H	X	η	χ
8	(	8	H	X	h	x			¨	Έ	Θ	Ψ	θ	ψ
9	)	9	I	Y	i	y	‰	™	©	Ή	I	Ω	ι	ω
A	*	:	J	Z	j	z			ª	Ί	K	Ϊ	κ	ϊ
B	+	;	K	[	k	{	‹	›	«	»	Λ	Ÿ	λ	ϋ
C	,	<	L	\	l	|			¬	Ό	M	ά	μ	ό
D	-	=	M	]	m	}			-	½	N	έ	ν	ύ
E	.	>	N	^	n	~			®	Ύ	Ξ	ή	ξ	ώ
F	/	?	O	_	o	▩			—	Ώ	O	ί	o	

(11) PC-1254

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

(12) PC-1257

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		0	@	P	`	p	€			°	Ą	Š	ą	š
1	!	1	A	Q	a	q		‘		±	Į	Ń	į	ń
2	"	2	B	R	b	r	,	’	ç	²	Ā	Ņ	ā	ņ
3	#	3	C	S	c	s		“	£	³	Ć	Ó	ć	ó
4	$	4	D	T	d	t	„	”	¤	´	Ä	Ō	ä	ō
5	%	5	E	U	e	u	…	•		µ	Å	Õ	å	õ
6	&	6	F	V	f	v	†	–	¦	¶	Ę	Ö	ę	ö
7	'	7	G	W	g	w	‡	—	§	·	Ē	×	ē	÷
8	(	8	H	X	h	x			Ø	ø	Č	Ų	č	ų
9	)	9	I	Y	i	y	‰	™	©	¹	É	Ł	é	ł
A	*	:	J	Z	j	z			Ŗ	ŗ	Ź	Ś	ź	ś
B	+	;	K	[	k	{	‹	›	«	»	Ė	Ū	ė	ū
C	,	<	L	\	l	|			¬	¼	Ģ	Ü	ģ	ü
D	-	=	M	]	m	}	¨	¯	-	½	Ķ	Ż	ķ	ż
E	.	>	N	^	n	~	ˇ	¸	®	¾	Ī	Ž	ī	ž
F	/	?	O	_	o	▩	˙		Æ	æ	Ļ	ß	ļ	˙

(13) LATIN9

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

(14) Arabic

	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	|	،	٠	ت	\	ع				ى	ؤ	ِ	ُ	
1	أ	-	=	ث	]	ع			ل	ى	لا	ً	ٌ	
2	أ	.	'	ث	,	ع			ل	ء	ﻻ	ُ	ٌ	
3	آ	/	؟	ج	ـ	غ			م	ث	لأ	ً	ٍ	
4		٠	ـ	ج	ز	غ			م	ئ	ﻷ	ٌ	ٍ	
5	!	١	ا	ح	س	غ			ن	0	لآ	ٍ		
6	"	٢	ا	ح	س	غ			ه	1	ﻵ	ٍ	ّ	
7	«	٣	أ	ح	ش	ف			ة	2	لإ	َ	ن	
8	»	٤	أ	ح	ش	ف			ه	3	ﻹ	ُ		
9	٪	٥	آ	خ	ص	ف			ه	4	َ	ٌ		
A	×	٦	آ	خ	ص	ق			و	5	ُ	ً		
B	÷	٧	إ	خ	ض	ق			ى	6	ٌ	ّ		
C	(	٨	إ	د	ض	ق			ي	7	ً	َ		
D	)	٩	ب	ذ	ط	ك			ي	8	ّ	ـ		
E	*	:	ب	ر	ظ	ك			ة	9	َ	ـ		
F	+	؛	ت	[	ع				ة	ئ	ـ	ِ		

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	/D	4	D	T	+D	+T
5	/E	5	E	U	+E	+U
6	/F	6	F	V	+F	+V
7	/G	7	G	W	+G	+W
8	/H	8	H	X	+H	+X
9	/I	9	I	Y	+I	+Y
A	/J	/Z	J	Z	+J	+Z
B	+	%F	K	%K	+K	%P
C	/L	%G	L	%L	+L	%Q
D	–	%H	M	%M	+M	%R
E	.	%I	N	%N	+N	%S
F	/	%J	O	%O	+O	%T

(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
0	SP	SP	00
1	!	!	01
2	"	"	02
3	#	#	03
4	$	$	04
5	%	%	05
6	&	&	06
7	'	'	07
8	(	(	08
9	)	)	09
10	*	*	10
11	+	+	11
12	,	,	12
13	–	–	13
14	.	.	14
15	/	/	15
16	0	0	16
17	1	1	17
18	2	2	18
19	3	3	19
20	4	4	20
21	5	5	21
22	6	6	22
23	7	7	23
24	8	8	24
25	9	9	25
26	:	:	26
27	;	;	27
28	<	<	28
29	=	=	29
30	>	>	30
31	?	?	31
32	@	@	32
33	A	A	33
34	B	B	34
35	C	C	35

VALUE	CODE A	CODE B	CODE C
36	D	D	36
37	E	E	37
38	F	F	38
39	G	G	39
40	H	H	40
41	I	I	41
42	J	J	42
43	K	K	43
44	L	L	44
45	M	M	45
46	N	N	46
47	O	O	47
48	P	P	48
49	Q	Q	49
50	R	R	50
51	S	S	51
52	T	T	52
53	U	U	53
54	V	V	54
55	W	W	55
56	X	X	56
57	Y	Y	57
58	Z	Z	58
59	[	[	59
60	\	\	60
61	]	]	61
62	^	^	62
63	_	_	63
64	NUL	`	64
65	SOH	a	65
66	STX	b	66
67	ETX	c	67
68	EOT	d	68
69	ENQ	e	69
70	ACK	f	70
71	BEL	g	71

VALUE	CODE A	CODE B	CODE C
72	BS	h	72
73	HT	i	73
74	LF	j	74
75	VT	k	75
76	FF	l	76
77	CR	m	77
78	SO	n	78
79	SI	o	79
80	DLE	p	80
81	DC1	q	81
82	DC2	r	82
83	DC3	s	83
84	DC4	t	84
85	NAK	u	85
86	SYN	v	86
87	ETB	w	87
88	CAN	x	88
89	EM	y	89
90	SUB	z	90
91	ESC	{	91
92	FS	¦	92
93	GS	}	93
94	RS	~	94
95	US	DEL	95
96	FNC3	FNC3	96
97	FNC2	FNC2	97
98	SHIFT	SHIFT	98
99	CODE C	CODE C	99
100	CODE B	FNC4	CODE B
101	FNC4	CODE A	CODE A
102	FNC1	FNC1	FNC1

103	START CODE A
104	START CODE B
105	START CODE C

(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)

[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 ! ” # $ % & ’ ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | } ~ △ 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	△								

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) QR code

When manual mode is selected in the Format Command

• Numeric mode, alphanumeric and symbol mode, Kanji mode

Mode selection	Data to be printed

• Binary mode

Mode selection	No. of data strings (4 digits)	Data to be printed

• Mixed mode

Data	"," (comma)	Data	"," (comma)	Data

The QR code can handle all codes including alphanumerics, symbols, and Kanji. However, since the data compression rate varies according to codes, the code to be used should be designated by selecting the mode.

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.

When the automatic mode is selected in the Format Command for a QR code:

Data to be printed

[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.

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

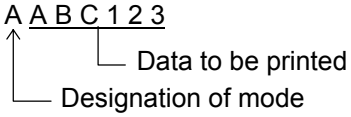
> (3EH) → >0 (3EH, 30H)

③ How to send a Kanji code

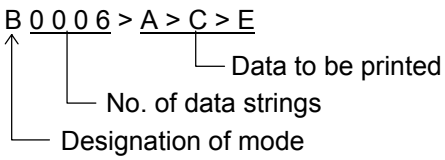
Shift JIS
JIS hexadecimal
(For details, refer to the section for the Bar Code Data Command.)

Examples of data designation for QR code

① Alphanumeric mode: ABC123

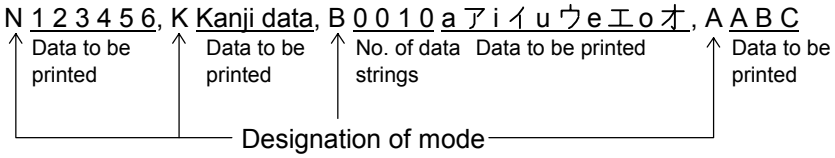


② Binary mode: 01H, 03H, 05H



③ Mixed mode

Numeric mode : 123456
Kanji mode : Kanji data
Binary mode : aアiイuウeエoオ
Alphanumeric and symbol mode : ABC



④ Automatic mode

When the same data as ③ above is designated in automatic mode:

1 2 3 4 5 6 Kanji data aアiイuウeエoオA B C
Data to be printed

(11) 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.

(12) 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	Đ	208	ð	240	DLE	16
17	010001	Q	81	q	113	Ñ	209	ñ	241	DC1	17
18	010010	R	82	r	114	Ò	210	ò	242	DC2	18
19	010011	S	83	s	115	Ó	211	ó	243	DC3	19
20	010100	T	84	t	116	Ô	212	ô	244	DC4	20
21	010101	U	85	u	117	Õ	213	õ	245	NAK	21
22	010110	V	86	v	118	Ö	214	ö	246	SYN	22
23	010111	W	87	w	119	×	215	÷	247	ETB	23
24	011000	X	88	x	120	Ø	216	ø	248	CAN	24
25	011001	Y	89	y	121	Ù	217	ù	249	EM	25
26	011010	Z	90	z	122	Ú	218	ú	250	SUB	26
27	011011	[EC]		[EC]		[EC]		[EC]		[EC]	
28	011100	FS	28	FS	28	FS	28	FS	28	[Pad]	
29	011101	GS	29	GS	29	GS	29	GS	29	[Pad]	
30	011110	RS	30	RS	30	RS	30	RS	30	ESC	27
31	011111	[NS]		[NS]		[NS]		[NS]		[NS]	
32	100000	Space	32	(	123	Û	219	û	251	FS	28
33	100001	[Pad]		[Pad]		Ü	220	ü	252	GS	29
34	100010	“	34	)	125	Ý	221	ý	253	RS	30
35	100011	#	35	~	126	Þ	222	þ	254	US	31
36	100100	$	36	DEL	127	ß	223	ÿ	255	{C159}	159
37	100101	%	37	;	59	ª	170	¡	161	NBSP	160
38	100110	&	38	<	60	¬	172	¨	168	¢	162
39	100111	‘	39	=	61	±	177	«	171	£	163
40	101000	(	40	>	62	²	178	¯	175	¤	164
41	101001	)	41	?	63	³	179	°	176	¥	165
42	101010	”	42	[	91		181	'	180		166
43	101011	+	43	\	92	¹	185	•	183	§	167
44	101100	,	44	]	93	º	186		184	©	169
45	101101	-	45	^	94	¼	188	»	187	SHY	173
46	101110	.	46	_	95	½	189	¿	191	®	174
47	101111	/	47	Space	32	¾	190	{C138}	138	¶	182
48	110000	0	48	,	44	{C128}	128	{C139}	139	{C149}	149
49	110001	1	49	.	46	{C129}	129	{C140}	140	{C150}	150
50	110010	2	50	/	47	{C130}	130	{C141}	141	{C151}	151
51	110011	3	51	:	58	{C131}	131	{C142}	142	{C152}	152
52	110100	4	52	@	64	{C132}	132	{C143}	143	{C153}	153
53	110101	5	53	!	33	{C133}	133	{C144}	144	{C154}	154
54	110110	6	54	|	124	{C134}	134	{C145}	145	{C155}	155
55	110111	7	55	[Pad]		{C135}	135	{C146}	146	{C156}	156
56	111000	8	56	[2 Shift A]		{C136}	136	{C147}	147	{C157}	157
57	111001	9	57	[3 Shift A]		{C137}	137	{C148}	148	{C158}	158
58	111010	:	58	[Pad]		[Latch A]		[Latch A]		[Latch A]	
59	111011	[Shift B]		[Shift A]		Space	32	Space	32	Space	32
60	111100	[Shift C]		[Shift C]		[Lock In C]		[Shift C]		[Shift C]	
61	111101	[Shift D]		[Shift D]		[Shift D]		[Lock In D]		[Shift D]	
62	111110	[Shift E]		[Shift E]		[Shift E]		[Shift E]		[Lock In E]	
63	111111	[Latch B]		[Latch A]		[Latch B]		[Latch B]		[Latch B]	

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.*

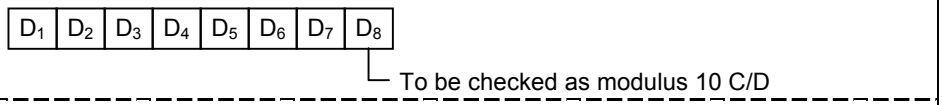
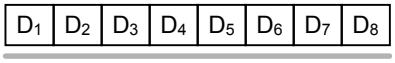
14. DRAWING OF BAR CODE DATA

——— : Field to be incremented/decremented
(The absence of a solid line invalidates incrementing/decrementing.)

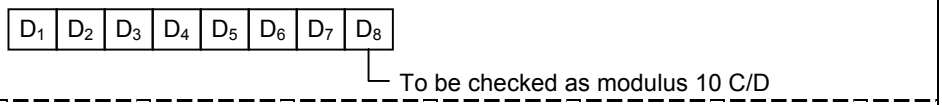
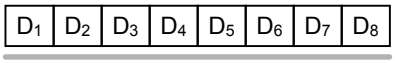
——— : Field subject to printing numerals under bars.

Type of Bar Code: JAN8, EAN8

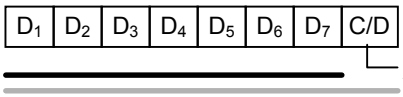
(1) No affix

No. of Input Digits		
8 digits	Input Data	
	Drawing Data	
Other than 8 digits		Not to be drawn

(2) Modulus 10 check

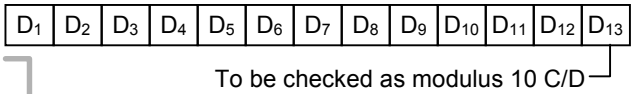
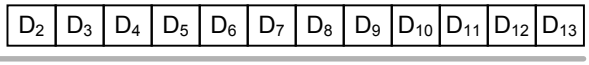
No. of Input Digits		
8 digits	Input Data	
	Drawing Data	
Other than 8 digits		Not to be drawn

(3) Auto affix of modulus 10

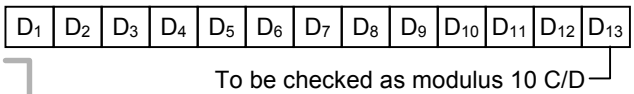
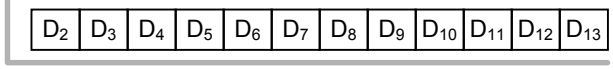
No. of Input Digits		
7 digits	Input Data	
	Drawing Data	
Other than 7 digits		Not to be drawn

Type of Bar Code: JAN13, EAN13

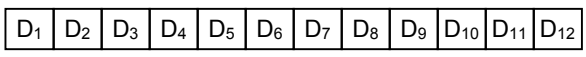
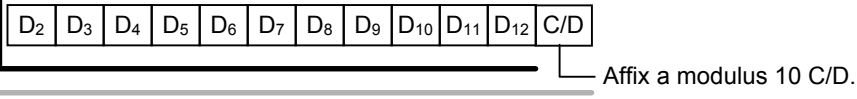
(1) No affix

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

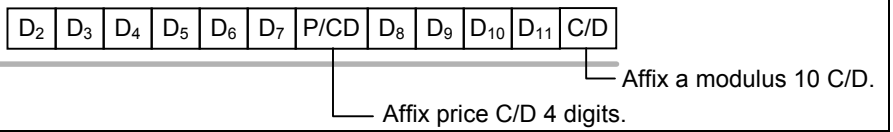
(2) Modulus 10 check

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

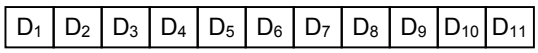
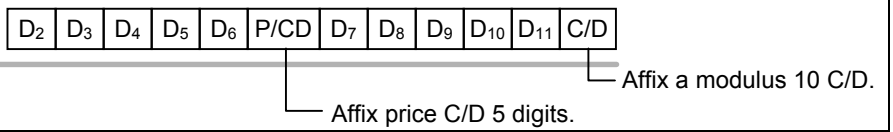
(3) Auto affix of modulus 10

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

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

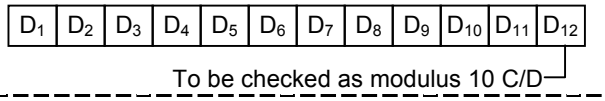
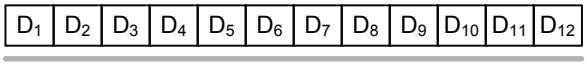
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

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

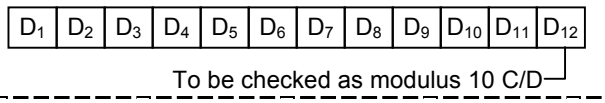
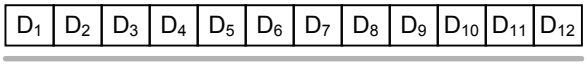
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

Type of Bar Code: UPC-A

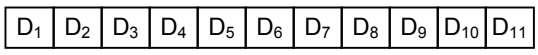
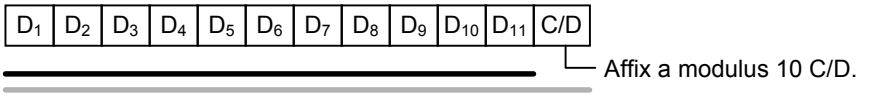
(1) No affix

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

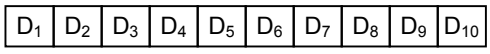
(2) Modulus 10 check

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

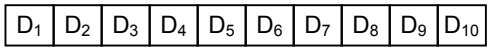
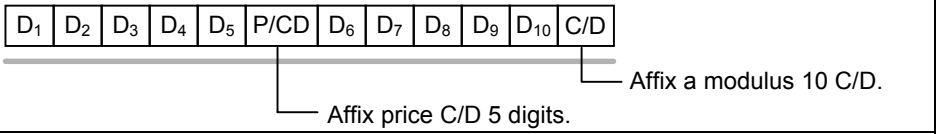
(3) Auto affix of modulus 10

No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
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	
	Drawing Data	
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	
	Drawing Data	
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	D_1 D_2 D_3 D_4 D_5 D_6 D_7 — 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
Other than 7 digits		Not to be drawn

(2) Modulus 10 check

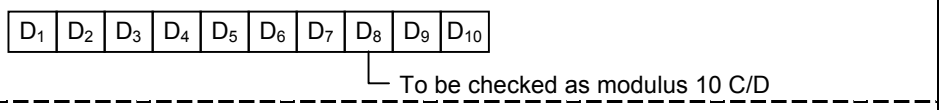
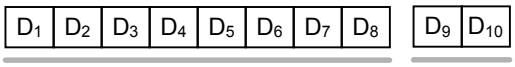
No. of Input Digits		
7 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 — To be checked as modulus 10 C/D
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 D_7
Other than 7 digits		Not to be drawn

(3) Auto affix of modulus 10

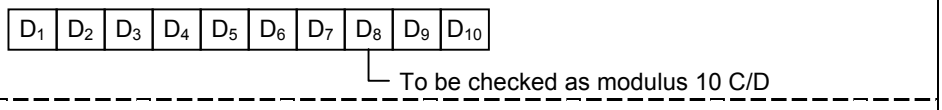
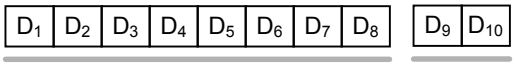
No. of Input Digits		
6 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 Calculate and reflect modulus 10 in the bar code.
	Drawing Data	0 D_1 D_2 D_3 D_4 D_5 D_6 C/D
Other than 6 digits		Not to be drawn

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

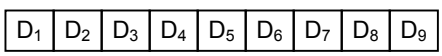
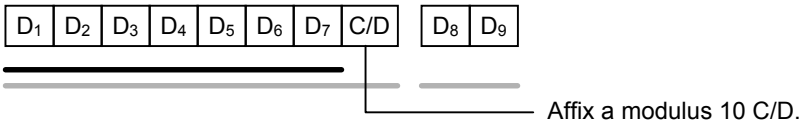
(1) No affix

No. of Input Digits		
10 digits	Input Data	
	Drawing Data	
Other than 10 digits		Not to be drawn

(2) Modulus 10 check

No. of Input Digits		
10 digits	Input Data	
	Drawing Data	
Other than 10 digits		Not to be drawn

(3) Auto affix of modulus 10

No. of Input Digits		
9 digits	Input Data	
	Drawing Data	
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	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_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

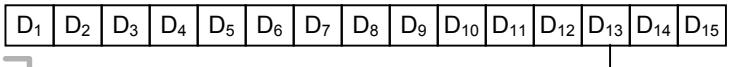
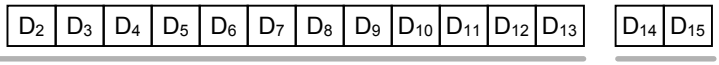
No. of Input Digits		
13 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13} └ To be checked as modulus 10 C/D
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12} D_{13}
Other than 13 digits		Not to be drawn

(3) Auto affix of modulus 10

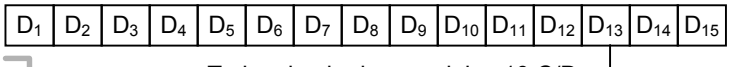
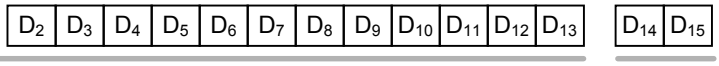
No. of Input Digits		
12 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 D_{10} D_{11} D_{12}
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 C/D D_8 D_9 D_{10} D_{11} D_{12} └ Affix a modulus 10 C/D.
Other than 12 digits		Not to be drawn

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

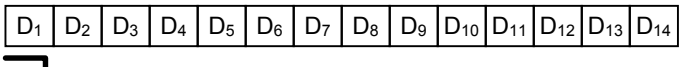
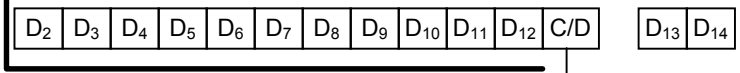
(1) No affix

No. of Input Digits		
15 digits	Input Data	
		To be checked as modulus 10 C/D
	Drawing Data	
Other than 15 digits		Not to be drawn

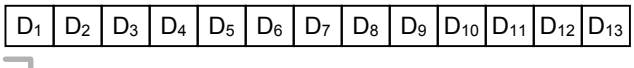
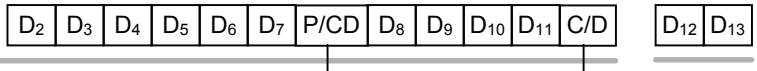
(2) Modulus 10 check

No. of Input Digits		
15 digits	Input Data	
		To be checked as modulus 10 C/D
	Drawing Data	
Other than 15 digits		Not to be drawn

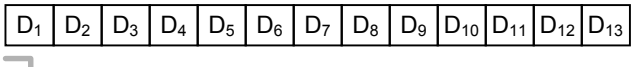
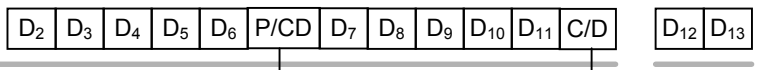
(3) Auto affix of modulus 10

No. of Input Digits		
14 digits	Input Data	
	Drawing Data	
		Affix a modulus 10 C/D.
Other than 14 digits		Not to be drawn

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

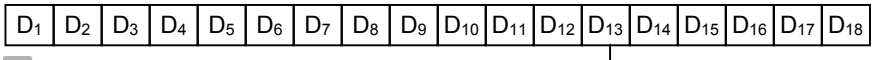
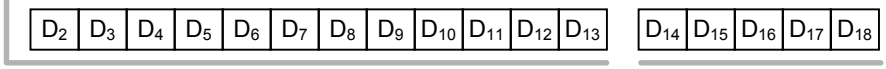
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
		Affix a modulus 10 C/D.
		Affix price C/D 4 digits.
Other than 13 digits		Not to be drawn

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

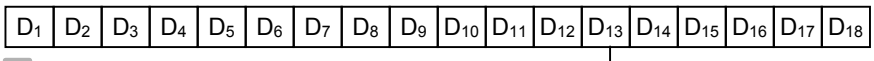
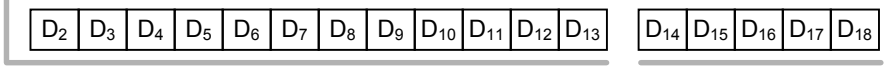
No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
		Affix a modulus 10 C/D.
		Affix price C/D 5 digits.
Other than 13 digits		Not to be drawn

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

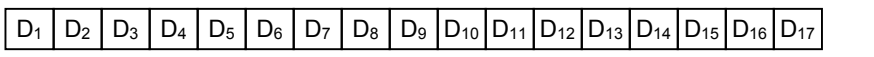
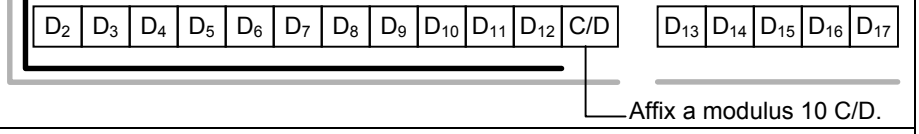
(1) No affix

No. of Input Digits		
18 digits	Input Data	
	Drawing Data	
Other than 18 digits		Not to be drawn

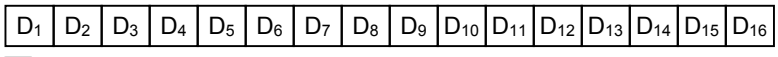
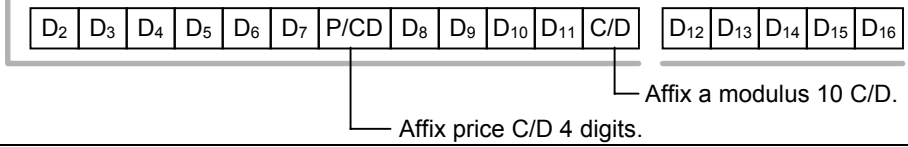
(2) Modulus 10 check

No. of Input Digits		
18 digits	Input Data	
	Drawing Data	
Other than 18 digits		Not to be drawn

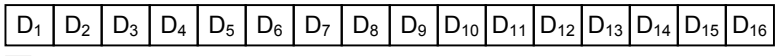
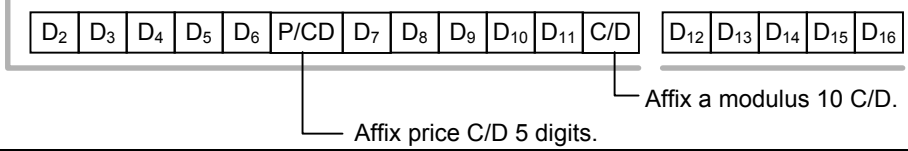
(3) Auto affix of modulus 10

No. of Input Digits		
17 digits	Input Data	
	Drawing Data	
Other than 17 digits		Not to be drawn

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

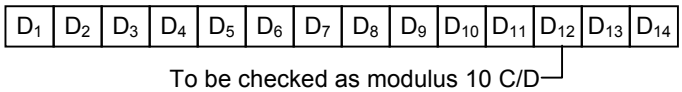
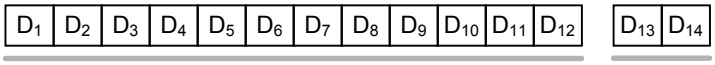
No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

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

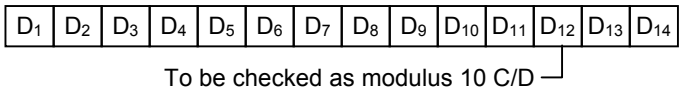
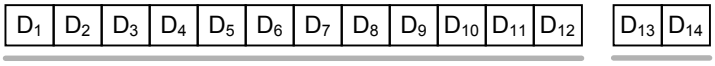
No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

Type of Bar Code: UPC-A + 2 digits

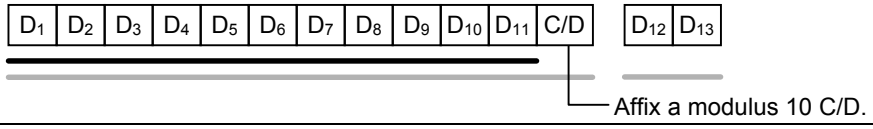
(1) No affix

No. of Input Digits		
14 digits	Input Data	
	Drawing Data	
Other than 14 digits		Not to be drawn

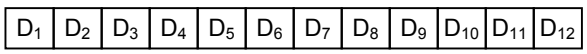
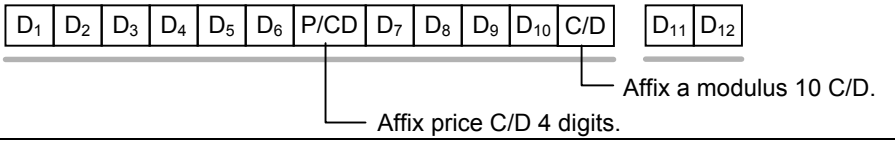
(2) Modulus 10 check

No. of Input Digits		
14 digits	Input Data	
	Drawing Data	
Other than 14 digits		Not to be drawn

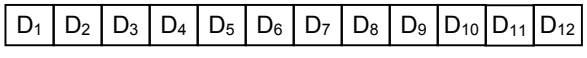
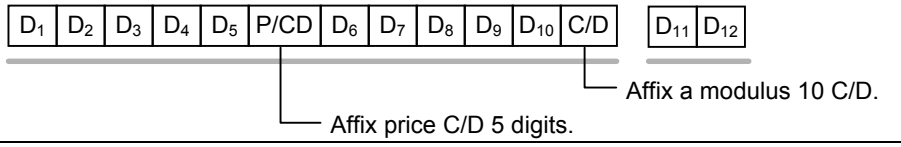
(3) Auto affix of modulus 10

No. of Input Digits		
13 digits	Input Data	
	Drawing Data	
Other than 13 digits		Not to be drawn

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

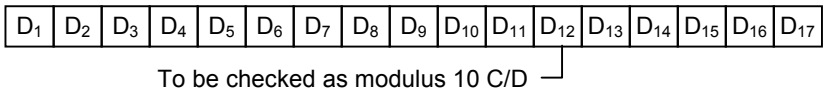
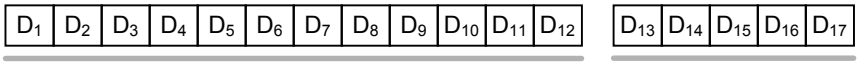
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

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

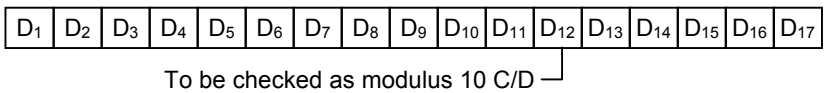
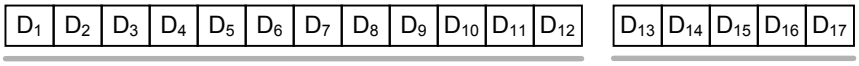
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

Type of Bar Code: UPC-A + 5 digits

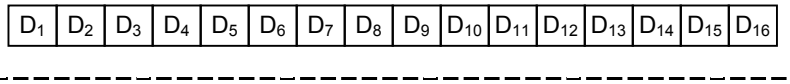
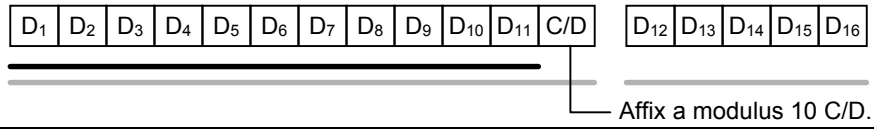
(1) No affix

No. of Input Digits		
17 digits	Input Data	
	Drawing Data	
Other than 17 digits		Not to be drawn

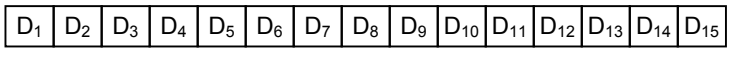
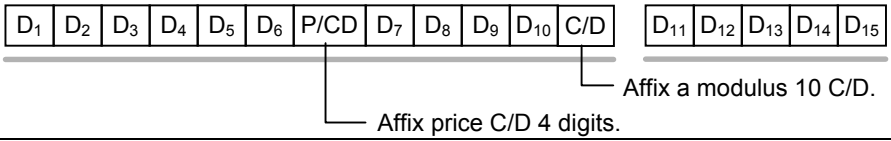
(2) Modulus 10 check

No. of Input Digits		
17 digits	Input Data	
	Drawing Data	
Other than 17 digits		Not to be drawn

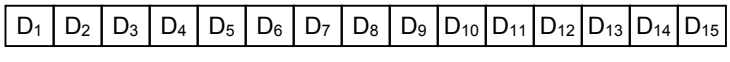
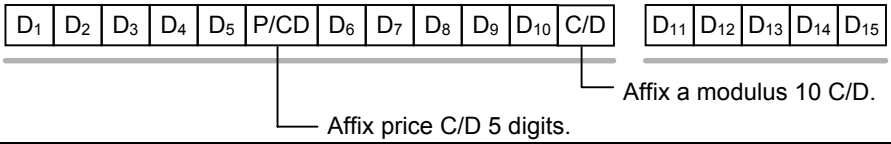
(3) Auto affix of modulus 10

No. of Input Digits		
16 digits	Input Data	
	Drawing Data	
Other than 16 digits		Not to be drawn

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

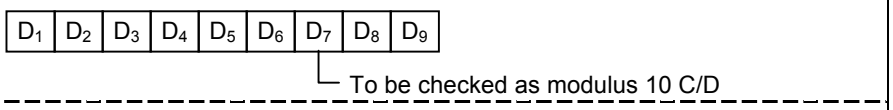
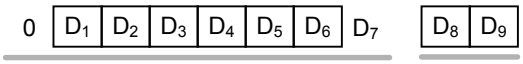
No. of Input Digits		
15 digits	Input Data	
	Drawing Data	
Other than 15 digits		Not to be drawn

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

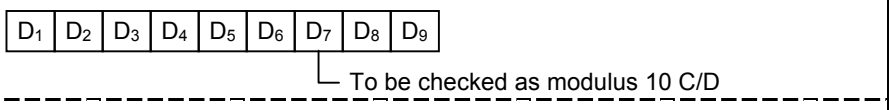
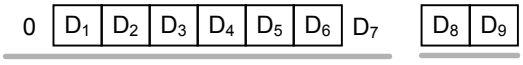
No. of Input Digits		
15 digits	Input Data	
	Drawing Data	
Other than 15 digits		Not to be drawn

Type of Bar Code: UPC-E + 2 digits

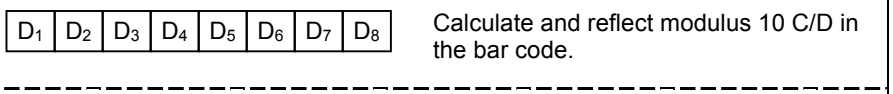
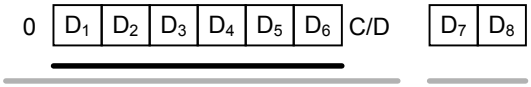
(1) No affix

No. of Input Digits		
9 digits	Input Data	
	Drawing Data	
Other than 9 digits		Not to be drawn

(2) Modulus 10 check

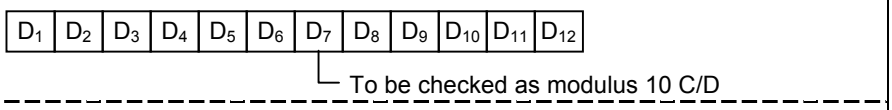
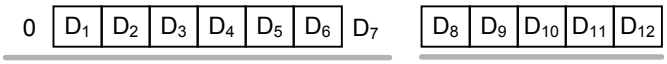
No. of Input Digits		
9 digits	Input Data	
	Drawing Data	
Other than 9 digits		Not to be drawn

(3) Auto affix of modulus 10

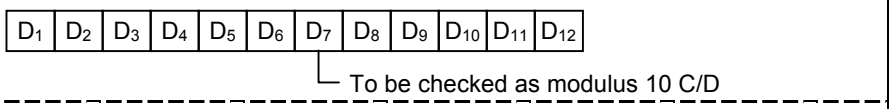
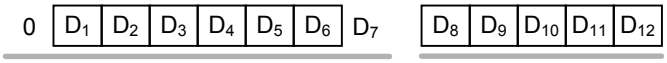
No. of Input Digits		
8 digits	Input Data	
	Drawing Data	
Other than 8 digits		Not to be drawn

Type of Bar Code: UPC-E + 5 digits

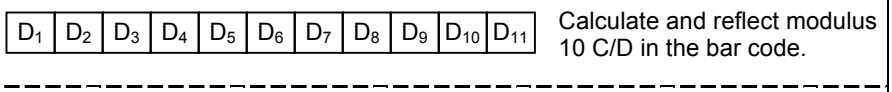
(1) No affix

No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

(2) Modulus 10 check

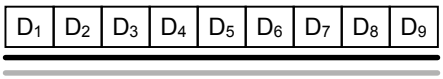
No. of Input Digits		
12 digits	Input Data	
	Drawing Data	
Other than 12 digits		Not to be drawn

(3) Auto affix of modulus 10

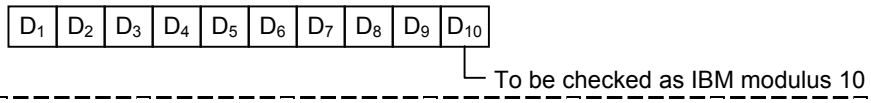
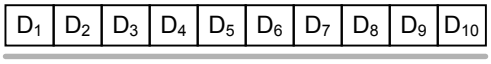
No. of Input Digits		
11 digits	Input Data	
	Drawing Data	
Other than 11 digits		Not to be drawn

Type of Bar Code: MSI

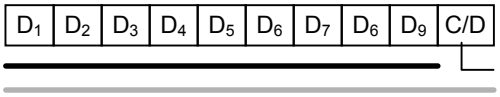
(1) No affix

No. of Input Digits		
Max. 15 digits	Input Data	
	Drawing Data	
16 digits or more		Not to be drawn

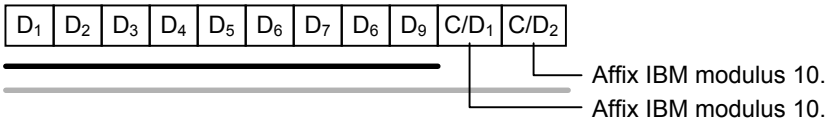
(2) IBM modulus 10 check

No. of Input Digits		
Min. 2 digits Max. 15 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 16 digits or more		Not to be drawn

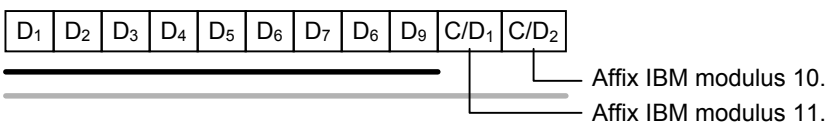
(3) Auto affix of IBM modulus 10

No. of Input Digits		
Max. 14 digits	Input Data	
	Drawing Data	
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	
	Drawing Data	
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	
	Drawing Data	
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

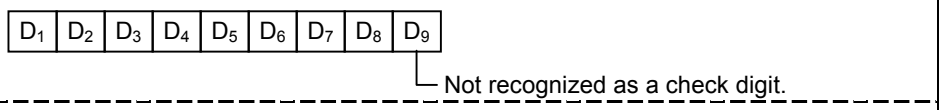
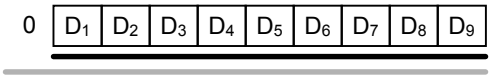
No. of Input Digits		
Max. 125 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_6 D_9 C/D — Affix a modulus 10 C/D.
126 digits or more		Not to be drawn

(4) Auto affix of DBP modulus 10

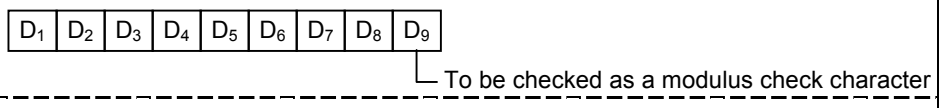
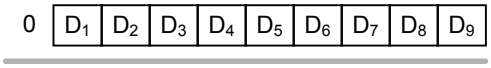
No. of Input Digits		
Max. 125 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_6 D_9 C/D — Affix a DBP modulus 10.
126 digits or more		Not to be drawn

Type of Bar Code: Industrial 2 of 5

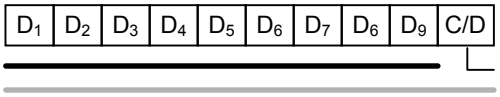
(1) No affix

No. of Input Digits		
Max. 126 digits	Input Data	
	Drawing Data	
127 digits or more		Not to be drawn

(2) Modulus check character check

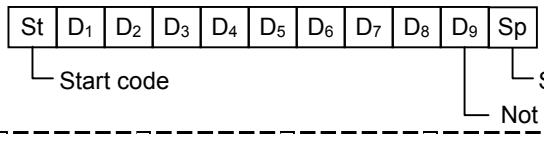
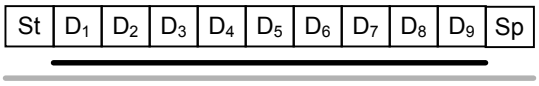
No. of Input Digits		
Min. 2 digits Max. 126 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 127 digits or more		Not to be drawn

(3) Auto affix of modulus check character

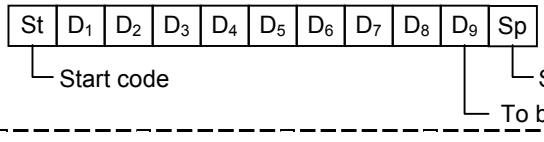
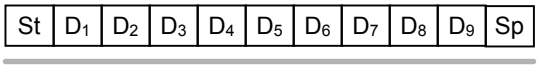
No. of Input Digits		
Max. 125 digits	Input Data	
	Drawing Data	
126 digits or more		Not to be drawn

Type of Bar Code: CODE39 (Standard)

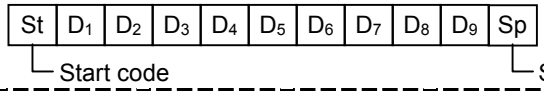
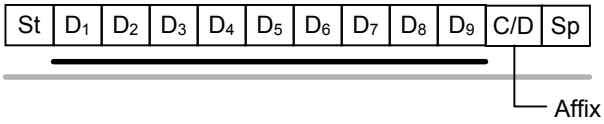
(1) No affix

No. of Input Digits		
Max. 123 digits	Input Data	
	Drawing Data	
124 digits or more		Not to be drawn

(2) Modulus 43 check

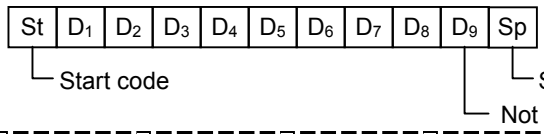
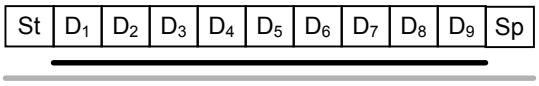
No. of Input Digits		
Min. 2 digits Max. 123 digits (including C/D)	Input Data	
	Drawing Data	
1 digit 124 digits or more		Not to be drawn

(3) Auto affix of modulus 43

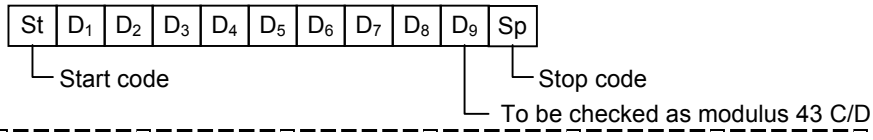
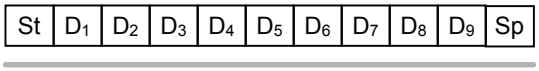
No. of Input Digits		
Max. 122 digits	Input Data	
	Drawing Data	
123 digits or more		Not to be drawn

Type of Bar Code: CODE39 (Full ASCII)

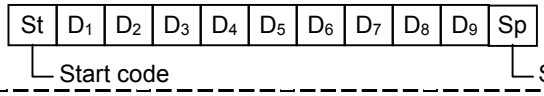
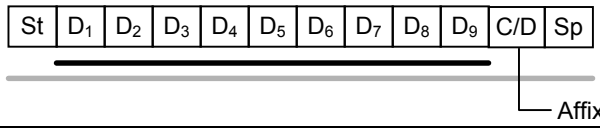
(1) No affix

No. of Input Digits		
Max. 60 digits	Input Data	
	Drawing Data	
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	
	Drawing Data	
1 digit 61 digits or more		Not to be drawn

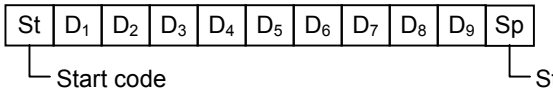
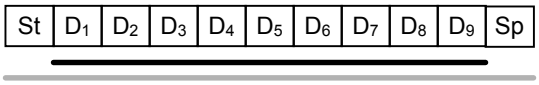
(3) Auto affix of modulus 43

No. of Input Digits		
Max. 60 digits	Input Data	
	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: NW7

(1) No affix
C/D check
Auto affix

No. of Input Digits		
Max. 123 digits	Input Data	
	Drawing Data	
124 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 Affix PSEUDO103 C/D.
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 Start code Selection code Affix PSEUDO103 C/D. Stop code
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	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 C/D_1 C/D_2 Sp Start code Affix a modulus 47 "C" C/D. Affix a modulus 47 "K" C/D. Stop code
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	St FNC1 D_1 D_2 D_3 D_4 D_5 D_6 --- D_{14} D_{15} D_{16} D_{17} D_{18} D_{19} C/D_1 C/D_2 Sp Start code Affix a modulus 10 C/D. Affix a modulus 11 C/D. Stop code
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	St D_1 D_2 D_3 D_4 D_5 C/D Sp Start code Stop code Dedicated check digit
9 digits	Input Data	D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9
	Drawing Data	St D_1 D_2 D_3 D_4 D_5 D_6 D_7 D_8 D_9 C/D Sp Start code Stop code Dedicated check digit
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	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 Start code Frame Frame Stop code Dedicated check digit
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) Start code Stop code
	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} D_{12} C/D Sp Start code Stop code Dedicated check digit
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	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 Start code Dedicated check digit Stop code
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	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 Start code CC7 Dedicated check digit Stop code
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*
	Add start code	12345ABC	Standard	*12345ABC
			Full ASCII	*12345ABC
		*12345ABC	Standard	**12345ABC
			Full ASCII	*/J12345ABC
		12345ABC*	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345ABC	Standard	**12345ABC*
			Full ASCII	*/J12345ABC*
		12345*ABC	Standard	*12345*ABC
			Full ASCII	*12345/JABC
		**12345ABC	Standard	***12345ABC
			Full ASCII	*/J/J12345ABC
		*12345ABC**	Standard	**12345ABC**
			Full ASCII	*/J12345ABC/J*
		*12345*ABC*	Standard	**12345*ABC*
			Full ASCII	*/J12345/JABC*
	Add stop code	12345ABC	Standard	12345ABC*
			Full ASCII	12345ABC*
		*12345ABC	Standard	*12345ABC*
			Full ASCII	*12345ABC*
		12345ABC*	Standard	12345ABC**
			Full ASCII	12345ABC/J*
		12345ABC	Standard	*12345ABC**
			Full ASCII	*12345ABC/J*
		12345*ABC	Standard	12345*ABC*
			Full ASCII	12345/JABC*
		**12345ABC	Standard	**12345ABC*
			Full ASCII	*/J12345ABC*
		*12345ABC**	Standard	*12345ABC***
			Full ASCII	*12345ABC/J/J*
		*12345*ABC*	Standard	*12345*ABC**
			Full ASCII	*12345/JABC/J*

Type of 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